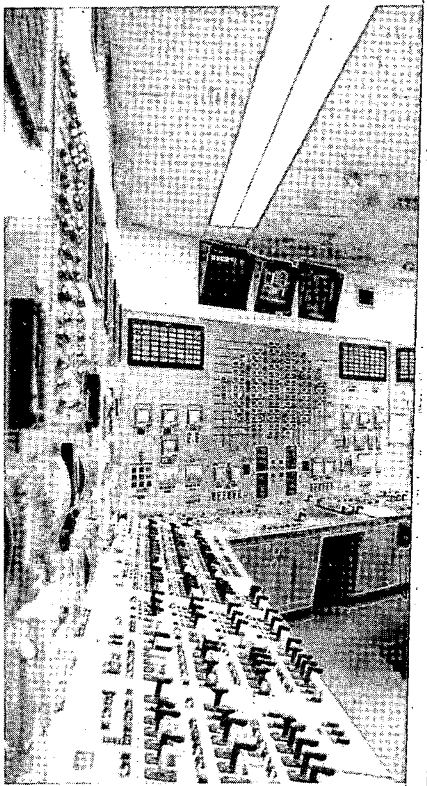
Detailed Control Room Design Review

Summary Report



Monticello Nuc

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December 1986

DETAILED CONTROL ROOM
DESIGN REVIEW

SUMMARY REPORT

MONTICELLO NUCLEAR GENERATING PLANT

Prepared for:

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

Prepared by:

Northern States Power Company
Nuclear Technical Services Department

and

Honeywell Inc.
Corporate Systems Development Division

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SECTION 1
INTRODUCTION

This document is a summary of the Detailed Control Room Design Review (DCRDR) at Northern States Power Company's Monticello Nuclear Generating Plant in Monticello, Minnesota. The Monticello DCRDR was a joint effort of Northern States Power Company and Honeywell Corporate Systems Development Division (formerly Honeywell Technology Strategy Center) and fulfills the requirements stated in the Nuclear Regulatory Commission regulations NUREG-0700 and NUREG-0800 for the DCRDR summary report:

> To document the results of the review, the licensee/applicant should submit a summary report of the completed review outlining proposed control room changes, including the proposed schedule for implementation. (NUREG-0800, Appendix A, p. 18.1-A.22.)

The control room review is part of an integrated plan for responding to the requirements of NUREG-0737 Supplement 1, which is a plan described in our submittal to the NRC on April 15, 1983. The design review plan describes activities for Monticello's control room review, emergency operating procedures development, safety parameter display system development, and training plans.

1.1 OBJECTIVE OF THE CONTROL ROOM DESIGN REVIEW

The objective of the control room design review was to "improve the ability of nuclear power plant control room operators to prevent accidents or cope with accidents if they occur by improving the information provided to them" (NUREG-0660, Item I.D.1; NUREG-0800, Appendix A, p. 18.1-A4). The design review was set up to identify modifications to the control room that significantly reduce the probability of operator error through changes in control room design or related areas of training or procedures.

1.2 REQUIREMENTS

Supplement 1 of NUREG-0737 identified the following activities to be part of the control room design review:

- The establishment of a qualified multidisciplinary review team and a review program incorporating accepted human engineering principles.
- A walk-through of the emergency operating procedures.
- A control room inventory based on plant-specific emergency procedure guidelines.

- A control room survey to identify deviation from accepted human factors principles.

- Identification and initiation of the necessary control room changes and a human factors review of these modifications.

1.3 BACKGROUND

1.3.1 Monticello Nuclear Generating Plant Description

The Monticello Nuclear Generating Plant (MNGP) is located approximately 40 miles northwest of the Twin Cities on a 1400-acre site on the southwest bank of the Mississippi River. MNGP began producing electricity in 1971.

The plant is a boiling water reactor (BWR) designed by General Electric Co. and constructed by the Bechtel Corporation. The reactor contains 484 fuel assemblies (approximately 200,000 pounds of uranium) and 121 control rods. These combine to provide 557 megawatts of electricity. The plant employs about 200 people and is owned by Northern States Power Company.

1.3.2 Detailed Control Room Design Review

A control room review was first performed by the Boiling Water Reactor Owners' Group (BWROG) in 1981. It was decided that the review did not adequately reference control room components. However, some data gathered by the BWROG review was used in the present review, when it was applicable and appropriate; this included operator interviews, environmental measurements, and design modification recommendations.

The Monticello DCRDR was conducted from January 1984 to December 1986. Table 1-1 lists the major milestones in the program.

1.4 SCOPE

The purpose of this report is to demonstrate Monticello's compliance with the U.S. Nuclear Regulatory Commission regulations and guidelines (including NUREG-0660; NUREG-0737, Supplement 1; NUREG-0700; and NUREG-0800) and to summarize the results of the Monticello design review.

Monticello has published interim reports to document the review activities and results completely. These reports are described in Section 2 of this report and are available at the Monticello site for review.

In this report, Monticello describes the methodology that was used for the DCRDR tasks and presents a detailed description of the results of the review. The emphasis is placed on the assessment and planned resolution of the Human Engineering Discrepancies (HEDs) identified during the review.

Table 1-1. Major Milestones for Monticello Control Room Design Review Activities

Year	Task
1981	Boiling Water Reactor Owners Group (BWROG) Control Room Survey
1984	Inventory Interviews Checklist Survey Convention Specification
1985	Task Analysis Verification OER Review
1986	HED Assessment Design Modification Proposals Review of Proposed Changes

The scope of this report includes the following topics, as recommended in NUREG-0800:

- Description of any significant changes that were made from the program plan report that was previously submitted, and an explanation of why these changes were made.
- Description of the proposed control room modifications with an explanation of how the HEDs were resolved (chosen for correction or noncorrection).
- Summary justification for HEDs with safety significance to be left uncorrected or partially corrected.
- Proposed schedule for implementation of modifications.

SECTION 2
PLANNING AND ORGANIZATION

2.1 PROGRAM MANAGEMENT

2.1.1 Objective

The objective of the DCRDR management plan and team selection was to assure that a qualified multidisciplinary team coordinated the review. The team's responsibility also included identifying and analyzing discrepancies and recommending corrections so that plant management could resolve these discrepancies. This objective has been satisfied in the control room design review at Monticello. This section describes the management of the design review program and identifies the staff responsible for the work.

2.1.2 Staffing

The Control Room Design Review Committee is responsible for the control room design review and implementation of control room improvements. The committee consists of a core group of specialists in the fields of human factors engineering, plant operations, systam engineering, instrumentation and controls engineering, and training. A supplemental group of specialists is available when needed for specific tasks to support the committee members. The committee structure provides an integrated "check and balance" system that provides commitment and competent support from personnel who are independent of plant daily operations, as well as availability of experts selected from plant operations and management.

The Control Room Design Review Committee is structured as a standing committee composed of the following eight positions:

- Superintendent of Nuclear Technical Services,
- Superintendent of Training,
- General Superintendent of Operations,
- Superintendent of Technical Engineering,
- Superintendent of Operations Engineering,
- Nuclear Technical Services Senior Operations Specialist,
- Day Lead Plant Equipment and Reactor Operator,
- Human Factors Specialist.

Four committee members are from the plant organization at Monticello and report to the plant manager. Two members are from the Nuclear Technical Services engineering group, and although located at the site, they report to Northern States Power Company's general office management through the Manager of Nuclear Technical Services. One member is from the Training Section. Human factors expertise was provided by the Honeywell Inc. Corporate Systems Development Division under the direction of the supervisor of the Artificial Intelligence Department (formerly Human Interface Systems). A specialist in nuclear control room systems review was provided by Energy Incorporated on a contract basis.

Figure 2-1 depicts the organization of the Control Room Design Review Committee divided into the four principal disciplines--project engineering, human factors, operations, and training. The present committee members are indicated by an asterisk in the figure. Other people nemed in the figure have provided significant supplemental support in control room design review activities.

The principal tasks, as outlined in the "Control Room Design Review Plan: Monticello Nuclear Generating Plant" were performed under the direction of the Superintendent of Nuclear Technical Services by employees of Honeywell Inc., Energy Incorporated Corporation, or Northern States Power Company, depending on the field of expertise needed. The output of the committee activities was a set of discrepancies from good human engineering practice in the control room and a set of recommended resolutions to correct the discrepancies.

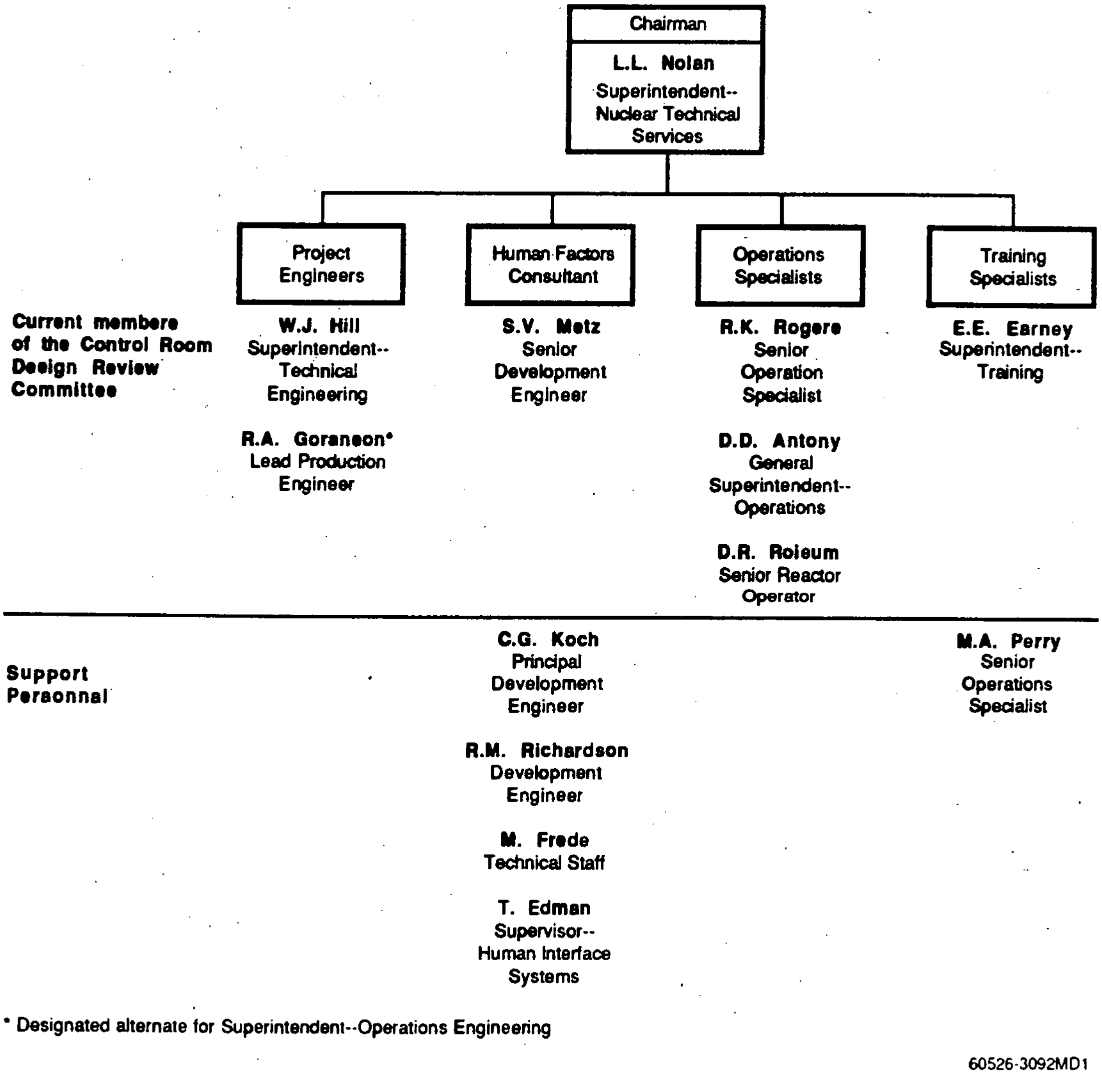

Figure 2-1. Organization of the Control Room Design Review Committee

Recommended solutions to correct discrepancies and make modifications to the control room were determined by the Control Room Design Review Committee and then presented to NSP management.

The duties of the committee members are described in Table 2-1.

The qualifications and background of the Control Room Design Review Committee members and support personnel are detailed in the resumes contained in Appendix A.

2.2 MODIFICATIONS TO THE PROGRAM PLAN REPORT

One of the purposes of the DCRDR Summary Report was to describe any significant changes that were made from the previously submitted program plan report and to explain why these changes were made. This subsection addresses that requirement.

The program plan report for the Monticello DCRDR, entitled "Control Room Design Review Plan: Monticello Nuclear Generating Plant," was submitted by Northern States Power Company to the U.S. Nuclear Regulatory Commission in December 1983. It served as an accurate plan for the control room design review throughout its duration. The only changes to the methodology stated in the Control Room Design Review Plan revolve around the addition of more specific details in the approach for an activity (for example, the HED assessment process). These were not significant exceptions to the terms of the Control Room Design Review Plan, but were enhancements based on experience during the human engineering review. Each change and its justification is described below:

- Composition of the Control Room Design Review Committee,
- Resurvey of the control room
- Management of the data base,
- Procedure to assess the significance of HEDs,
- Process for selecting and verifying control room design improvements.

2.2.1 Composition of the Control Room Design Review Committee

One additional position was added to the standing Control Room Design Review Committee: a representative from Operations--Day Lead Plant Equipment and Reactor Operator.

It was determined that additional representation of operations would strengthen the Control Room Design Review Committee and further the mission of improving the control room. The committee recognized that including operators in the process of control room modification is an important factor in the design and implementation of control room improvements. This change brought the Control Room Design Review Committee to a total of eight members.

Table 2-1. Duties of Members of the Control Room Design Review Committee

Committee Member	Duties
Chairman	Coordinates assignments among committee members Calls meetings, sets agendas Administers documentation Participates in the HED review process Participates in the final recommendation of HED priority and resolutions to correct HEDS Coordinates control room operators' recommendations for redesign options Ensures access to material and plant files for team members Ensures compliance with program plan Supplies specialized expertise as needed Ensures integration of the program with other design changes
Human Factors Consultant	Manages data collection activities Develops the guiding philosophy of the program and evaluates the adequacy of the program in accordance with NUREG documentation, such as NUREG-0660, NUREG-0700, and NUREG-0800 Manages the development and compilation of HEDs Participates in the final recommendation of HED priority and resolutions to correct HEDs Manages the process of generating concepts for design improvements Supplies specialized expertise as needed Prepares meeting minutes
Supplemental Committee Specialists	Participate in the HED review process Participate in the final recommendation of HED priority and resolutions to correct HEDs Supply specialized expertise as needed

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2.2.2 Resurvey of the Control Room

The BWROG survey did not document all control room problems with reference to individual components. This lack of component identification limited the transfer of the BWROG survey results. Furthermore, it was determined that the completion of the BWROG survey supplement would not fulfill the requirement of a complete control room survey.

It was necessary, therefore, to resurvey the control room to provide detailed component information and to permit tracking control room problems through the stages of resolution and redesign.

The information from the BWROG survey was used for the review of the operating environment, operating experience, and the operator interview sections of the DCRDR.

2.2.3 Management of the Data Base

The description of the data storage and manipulation capabilities in the Control Room Design Review Plan did not include computer-based data management. A computer-based data storage and retrieval system was implemented to provide faster, more reliable, and flexible data handling. It has proven invaluable in managing the information derived from the control room design review.

2.2.4 Procedure for HED Assessment

The procedure for assessing the safety significance of HEDs was not fully described in the Control Room Design Review Plan. The review of the Monticello Program Plan raised this HED assessment procedure as a concern. The methodology that was adopted, described in detail in Section 4, makes use of additional guidelines and research literature that became available after the submittal of the DCRDR Program Plan.

2.2.5 Selection of Design Improvements

The task of selecting control room design improvements and verifying that they correct HEDs and do not create significant new safety discrepancies was not fully described in the Control Room Design Review Plan. During the control room design review, it was decided that the importance of this task warranted a greater expenditure of labor and time than was originally planned. The procedures adopted for selecting and verifying control room design improvements are described in Sections 4 and 5, respectively.

2.3 DOCUMENTATION

The methodology and results of the Monticello DCRDR have been documented in various forms. This subsection introduces the technical reports that have been published as part of, or in support of, the DCRDR. They are available on site at Monticello.

The technical reports published during the DCRDR are organized into the following set of reports:

- Control room design review planning,
- Control room design review interim reports,
- Design requirements and conventions specifications,
- Human engineering discrepancy assessment results,
- Evaluation of proposed panel redesigns.

2.3.1 Control Room Design Review Planning

Documents in this category have been prepared in compliance with U.S. Nuclear Regulatory Commission guidelines to report on DCRDR planning:

- "Control Room Design Review Plan: Monticello Nuclear Generating Plant." Northern States Power Company, December 1983.

2.3.2 Control Room Design Review Interim Reports

A comprehensive record of the methodology and results of the review phase of the DCRDR was documented in this series of reports. They contain the raw data, usually in the form of checklists, derived from the data collection and review activities. They also contain the original Human Engineering Discrepancy Record Forms, which describe the observed discrepancies. (Section 3 describes the methodology of the control room design review.)

- "Monticello Nuclear Generating Plant Control Room Design Review--Operating Experience Review: Operator Interviews." Interim Report, Vol. I, Part 1. Honeywell Inc., Technology Strategy Center, July 1984.

- "Monticello Nuclear Generating Plant Control Room Design Review--Operating Experience Review: Operating Events." Interim Report, Vol. I, Part 2. Honeywell Inc., Technology Strategy Center, November 1985.

- "Monticello Nuclear Generating Plant Control Room Design Review--Control Room Inventory." Interim Report, Vol. II, Parts 1-3. Honeywell Inc., Technology Strategy Center, December 1984.

- "Monticello Nuclear Generating Plant Control Room Design Review--Component Checklist." Interim Report, Vol. III, Parts 1-11. Honeywell Inc., Technology Strategy Center, December 1984.

- "Monticello Nuclear Generating Plant Control Room Design Review, Interim Report--Surveys, Vol. IV, Part 1." Honeywell Inc., Technology Strategy Center, December 1984.

- "Monticello Nuclear Generating Plant Control Room Design Review--Additional Surveys." Interim Report, Vol. IV, Part 2. Honeywell Inc., Technology Strategy Center, July 1986 (Revised, December 1986).

- "Monticello Nuclear Generating Plant Control Room Design Review--Alternate Shutdown Panel Survey." Interim Report, Vol. IV, Part 3. Honeywell Inc., Corporate Systems Development Division, November 1986.

- "Monticello Nuclear Generating Plant Control Room Design Review--Task Analysis." Interim Report, Vol. V, Part 1. Honeywell Inc., Technology Strategy Center, September 1985.

- "Monticello Nuclear Generating Plant Control Room Design Review--Verification of Task Performance Capabilities." Interim Report, Vol. V, Part 2. Honeywell Inc., Technology Strategy Center, September 1985.

2.3.3 Design Requirements and Conventions Specifications

During the control room design review, design requirements and conventions for component design, labeling, color coding, and abbreviations were developed to standardize the operator interface with control room instrumentation using principles of good human engineering practice. The conventions were specified by description and example in the first two documents listed below (the second report was a revision of the first one). The third document is a report that presents the results of an evaluation of the suitability of the design requirements and conventions against the design guidelines in NUREG-0700. The final, validated version of the design requirements and conventions specification has been adopted by Monticello plant management. It will serve as a guide for the implementation of all subsequent design changes in the control room.

- "Human Engineering Design Requirements and Conventions Regarding Component Design, Labeling, and Abbreviations." Northern States Power Company, Monticello Nuclear Generating Plant, Revision 1, December 1984.

- "Human Engineering Design Requirements and Conventions Regarding Component Design, Labeling, and Abbreviations." Northern States Power Company, Monticello Nuclear Generating Plant, Revision 2, December 1985.

- "Evaluation of Design Conventions Specifications Against NUREG-0700 Guidelines." Interim Report, Vol. VII, Part 3, Honeywell Inc., Corporate Systems Development Division, November 1986.

2.3.4 Human Engineering Discrepancy Assessment Results

The following reports contain descriptions and listings of the results of the HED assessment phase. The first report is an updated compilation of all the HED information. The second and third documents are cross-indexed listings of the assessment rating scores and priority classifications established for each combination of HED and instrument. (Section 4 describes the HED assessment process.)

- "Monticello Nuclear Generating Plant Control Room Design Review--Human Engineering Discrepancy Assessment Results." Interim Report, Vol. VI, Parts 1 and 2. Honeywell Inc., Technology Strategy Center, February 1986.

- "Monticello Nuclear Generating Plant Control Room Design Review--Human Engineering Discrepancy Assessment Results: Rating Scores for All Instruments and All HEDs Sorted by Instrument." Working Report, Honeywell Inc., Technology Strategy Center, February 1986.

- "Monticello Nuclear Generating Plant Control Room Design Review--Human Engineering Discrepancy Assessment Results: Rating Scores for All Instruments and All HEDs Sorted by HED Code Number." Working Report, Honeywell Inc., Technology Strategy Center, February 1986.

2.3.5 Proposed Panel Redesigns and Their Evaluation

These reports listed below document the methodology and results of control room redesign and the human engineering review of the control room modifications proposed to resolve HEDs and improve the operator control room interface. (The proposed redesigns are reviewed in Section 5.)

- "Monticello Nuclear Generating Plant—Control Room Modification." Interim Report, Vol. VII, Part 1, Honeywell Inc., Corporate Systems Development Division, September 1986.

- "Monticello Nuclear Generating Plant--Evaluation of Proposed Panel Redesign." Interim Report, Vol VII, Part 2, Honeywell Inc., Corporate Systems Development Division, October 1986.

2.4 DATA COLLECTION AND MANAGEMENT

This subsection describes the data collection and management practices used during the design review, including the format in which the data is stored. The data bases are available on site at Monticello.

2.4.1 Recording of Information

Information collected during the control room design review was recorded in several forms. Data collection forms were used for the first record of HED-pertinent information for the operator interviews, component design review, work space survey review, and verification of task performance capabilities. Blank copies of each of these forms are included in Appendix B. After initial data collection, observed problems were described on HED Record Forms. A copy of the HED Record Form is also contained in Appendix B.

2.4.2 Computer Laboratory Facilities

During the process of compiling of HED information derived from the human engineering review activities, it became evident that computer-based data management was required to enable the effective storage, retrieval, and manipulation of information. A computer was available at the Honeywell Technology Strategy Center. A second laboratory was set up at the Nuclear Technical Services Department at Monticello. The facilities included anIBM-PC/XT and an IBM-PC/AT computer with at least 512,000 bytes of random access memory, a 10- or 20-Kbyte fixed disk, 5-1/4-inch floppy disk drive, and a dot matrix printer. Data were kept current in both systems by transporting floppy disks from one system to the other.

2.4.3 Computerized Data Base

Data Base Software--A relational data base software package from Ashton-Tate Corporation, dBase II,[1] was first selected for HED information storage,retrieval, and data manipulation. When a new release of the software package, dBase III,[1] beceme available, it was acquired for both systems. The existing data files were then transferred to the dBase III format.

The capabilities of this software system made it ideally suited for the data base management task. It has automatic storage of new entries to fixed disk medium, efficient sorting capabilities, extensive automatic report formatting and printing, and availability for IBM-PC series computers.

The relational data base capabilities made it possible to preserve all pertinent information about the equipment, systems, and tasks involved in each HED. The information sorting capability was frequently used by the design review team for component, panel, or system evaluation. Also, it was effective in examining interactions and cumulative effects across HEDs and across instruments. Since data can be manipulated according to a specific component, system, or panel, all relevant information involving a specific component or piece of equipment was readily available to aid the review team in developing component-specific corrective actions. Also, components identified with common HEDs could be coordinated to develop necessary corrections simultaneously.

Data Base Files--Four major data base files were created for storage and retrieval of HED information generated during the DCRDR:

- Master HED Data Base--This was considered the master data base and contained component identification information indexed by HED code number. For each HED, all instruments implicated in that HED are included in separate records in the data base. Since each record in this data base specified a single instrument, multiple records were often associated with a single HED Code Number.

- HED Description Data Base--This data base contained the descriptive information for HEDs in the format of an HED Record Form.

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[1]dBase II and dBase III are registered trademarks of the Ashton-Tate Corporation.

- Assessment Data Base--A portion of the component data base, including instrument identification and HED Code Number, was extracted as the root of the assessment data base. This was used to record the HED assessment rating results and perform analyses of the data.

- Resolutions Data Base--Resolutions that were determined for the HEDs were described in this data base, together with correction schedule information. This information became integrated with the HED description data base; correction codes were used to link corrections with the appropriate instrument numbers in the master HED data base.

Table 2-2 shows the categories of information stored in each of the four data bases.

Table 2-2. Design Review Data Bases

Data Base	Information Category
Master (Component) Data Base	HED Data Source—Operating Experience Review, Interview, Checklist, Survey, Task Analysis HED Code Number Control Board Panel Component Type Instrument Identification Number Instrument Label Correction Code
HED Description Data Base	HED Data Source HED Code Number NUREG-0700 Guideline Reference Component Type HED Description Relevance to Conventions Specification
Assessment Data Base	HED Code Number HED Data Source Component Identification Number Significance Rating Raw Scores Assessment Rating Scale Subscores Priority Category Classification
Resolutions Data Base	HED Code Number HED Data Source Correction Code Resolution Category Resolution Description

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SECTION 3
REVIEW PROCEDURES AND RESULTS

The activities conducted during the DCRDR at Monticello were:

- Operating Experience Review (OER),
- Component Checklist Review,
- Work Space Survey,
- System Review and Task Analysis (SRTA),
- Verification of Task Performance Capability,
- Convention Specification,
- Review of Remote Shutdown Capability,
- Review of Planned SPDS Computer Monitoring System.

This section outlines the review methodology and presents a summary of the results of each activity.

3.1 OPERATING EXPERIENCE REVIEW

The Operating Experience Review was composed of two parts: (1) structured interviews of a sample of operators were conducted to obtain human engineering data about control room design features, and (2) archival records of plant operational experience were examined for evidence of circumstances contributing to performance problems. As appropriate, HEDs were written from both parts.

3.1.1 Operator Interviews

This subsection summarizes the procedures used in conducting the operator interview phase of the OER and presents the interview results. A more detailed description can be found in the "Monticello Nuclear Generating Plant Control Room Design Review—Operating Experience Review: Operator Interviews" (Interim Report, Vol. I, Part 1, Honeywell Technology Strategy Center, July 1984).

The interviews were conducted during two independent efforts. The first set was completed during the Boiling Water Reactor Owners' Group Control Room Review in 1981. The second set of interviews was conducted as part of the Monticello Detailed Control Room Design Review in 1984. The methods used in each project are described below.

<u>BWROG Interviews--</u>

<u>Format</u>--The BWROG survey team used a four-page questionnaire that included 31 questions about control procedures, components, layout, etc. Space was provided below each question for the operator to write his responses. A sample questionnaire is available in Appendix B.

Procedure--Operators completed each questionnaire themselves. A member of the survey teem was present. Clarifications to the operators' answers were added in the form of marginal notes by a survey team member. The questionnaires were completed during March 1981.

Operator Profile--Seven operators were interviewed. A profile of these operators is presented in Table 3-1.

Honeywell DCRDR Interviews--The Honeywell DCRDR interview forms were composed of detailed questions about the advantages, disadvantages, and operational history of control room components and about the control room environment. These interviews used a structured and open-ended format that guided the interviewer. Detailed questions about control room environment, operations, and components were organized under the specific topics listed in Table 3-2. In addition to these topics, a set of critical incident questions was included to permit discussion of items that did not fall easily into the structured topic areas. A complete listing of the interview questions is presented in Appendix B. Each interviewee was asked every question on the interview form, and the forms were designed to assure that all answers would remain anonymous. An average interview took 3 hours.

Procedure--Each operator was interviewed individually by a member of the human factors team. Interviews took place in an area adjacent to the Monticello control room. Interviews were conducted in April 1984, either at the end of the night shift or before the afternoon shift.

Profile--Six operators were interviewed. Operators were selected so that they represented the varied backgrounds, experience, age, and education at Monticello. A profile of these operators is presented in Table 3-1.

Analysis--The completed questionnaires were analyzed in two stages. First, responses from the BWROG and Honeywell interviews were transcribed and summarized. The transcription process permitted minor modifications to the original data that clarified meaning or corrected spelling or grammar. In transcribing the interview protocols, an attempt was made to maintain the words used by the operator as written by the human factors interviewer. The original interviews remain on file at Monticello and are available for inspection upon request.

Second, HEDs were written from the transcribed responses. NUREG-0700 was used to define discrepancies, and checklist items from NUREG-0700, Section 6 were referenced as appropriate. A total of 104 HEDs covering a wide diversity of topics resulted from the analysis process. These HEDs are described fully in E.

HED information such as "Equipment ID Number" and "Component Function" was derived from the operator's description by referring to a control room photomosaic and the actual control room. Operators in the control room

Table 3-1. Profile of Interviewees

Operator*	Job Classification			Years of Experience					
	Reactor Operator	Senior Reactor Operator	Shift Supervisor	Fossil Plant	Nuclear Plant	Navy Nuclear	Simulator Training (Weeks)	Education	Age
1-6	2	2	2	--	--	--	--	--	--
7	x				5		5	High School; Votech, 2 years	28
8	x				5		4	High School; Air Force	28
9		x			7		5	High School; Navy Electronics	32
10			x	4	15.5		>10	College, 1 year	41
11			x		13		8	High School	32
12			x		2	5	3	College, BS	29

*Operators 1-6 participated in the BWROG Survey. Operators 7-12 participated in the Honeywell DCRDR interviews.

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clarified issues raised in the interview transcripts when necessary. Equipment that could not be identified by number and/or function was not designated with an instrument number for that HED.

3.1.2 Plant Operating Experience

This subsection describes the nature of the Monticello operational records examined and the approach used in reviewing those records for the OER. This section is subdivided into four topic areas:

- Data Base--A description of the types of Monticello operational reports.

- Review Criteria--A discussion of the criteria employed in the analysis of operational records.

- Method--A description of the procedure employed in this phase of the operating experience review.

Table 3-2. BWROG and Honeywell Interview Topics

Topic	BWROG Interviews	Honeywell DCRDR Interviews
Control Room Design	X	X
Control Room Environment	X	X
Control Board Design	X	X
Panel Design	X	X
Displays	X	X
Controls	X	X
Annunciator Warning System	X	X
Training–Selection	X	X
Labels	X	X
Procedures	X	X
Computer	X	X
Design Changes		X
Manning	X	X
Communications	X	X
Operational Practices	X	X
Protective Equipment		X

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- Results—A brief discussion of the common event patterns that either caused or contributed to incidents.

The objective of the examination of Monticello's operational records was to identify conditions that may contribute to human performance problems and that could be improved through the application of human engineering principles. The procedure used in examining the operational records is in accordance with NUREG-0700, Guidelines for Control Room Reviews.

Data Base—The data base included 224 reports (either as paper reports or microfilm records) of various plant operating events occurring from March 1981 to January 1985. The classification scheme is described in Table 3-3. The breakdown of these reports by event classification, and event type, and number of events is shown in Table 3-4. A further classification by year of event is shown in Table 3-5.

Table 3-3. Classification Categories for Operating Event Reports

Category	Description
Administrative	Event attributed to an administrative error such as the authorization of multiple work requests, which causes redundant systems to be simultaneously out of service
Calibration	Event attributed to the incorrect calibration of a device through either a maintenance error or drift
Communication	Event attributed to a communication breakdown either among control room personnel or between control room personnel and outside plant personnel
Design/Construction	Event attributed to a design and/or construction problem
Environment	Event attributed to an externally or environmentally caused disturbance
Equipment Failure	Event attributed to the failure of equipment to operate as designed
Human Engineering–Inside Control Room	Event attributed to a human engineering problem within the control room
Human Engineering–Outside Control Room	Event attributed to a human engineering problem outside the control room
Maintenance	Event attributed to an error in maintenance activity
Operation	Event attributed to an error in plant operation
Procedure	Event attributed to an incorrect or inadequate procedure
Status	Event attributed to the "discovered" status of a piece of plant equipment with no information about how the condition was created
Test	Planned test procedure resulting in a plant trip
Unknown	Inadequate information to attribute a cause to the event

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Table 3-4. Operating Experience Reports by Classification

Classification	Event		
	Significant Operating Events	Reportable Occurrences	Scram Reports
Administration	13	2	0
Calibration	0	1	0
Design	7	8	1
Environment	1	0	0
Equipment	21	38	3
HFE-Control Room	6	0	3
HFE-Not Control Room	7	1	0
Maintenance	20	9	2
Operation	5	0	1
Procedure	3	2	0
Report Not Available	23	0	0
Classification Not Known	3	1	1

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Reports prior to May 1981 were reviewed by the BWROG survey team in 1981. Their findings were included in this review based on a report in the BWROG review.

Review Criteria--The information contained in operational records is valuable. It can be used as an indicator of problems requiring further investigation or to corroborate other evidence of an HED. However, not all operational events were useful for the present control room redesign effort.

Regarding the analysis of operational records for the OER, NUREG-0700 states that "the effort. . .should be limited to problems that could impinge on control room operations or that reflect control room design deficiencies" (pp. 3-5). This recommendation is broad: any equipment failure or environmentally caused transient "impinges" on control room operations. Our criteria for detailed consideration were:

- The problem appeared potentially susceptible to human-engineering solutions, or other design solutions involving consideration of human factors. Human-engineering solutions are design changes made for the purpose of facilitating human performance.

Table 3-5. Operating Experience Report Classification by Year of Event

Classification	1981	1982	1983	1984	1985	Total
Administrative	5	4	4	2	0	15
Calibration	1	0	1	3	0	5
Design/Construction	7	2	4	0	0	13
Equipment Failure	18	21	20	13	0	72
HFE	5	6	2	7	0	20
Maintenance	9	10	8	6	0	33
Operation	3	2	0	3	1	9
Procedure	1	4	1	4	2	12
Environments	0	1	0	3	0	4
Report not available	0	1	0	21	1	23
Unknown	0	1	5	1	0	7
Total	49	52	45	63	4	213

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- The problem either was an operational one or problem in an on-line maintenance activity linked to operations. For example, most instrument test and calibration procedures require observation or cooperative action by operators.

Method—A computer listing of all reportable occurrence reports, significant operating event reports and scram reports was available. It included brief summaries of each event. For the period from 1981 to 1985, all original reports were reviewed by a human factors specialist at the Monticello facility. Each reviewed report was classified into one or more of the categories described in Table 3-3.

Evidence of a human-factors-design-induced error in operations was clarified through subsequent discussion with a member of the Nuclear Technical Services staff. When warranted, human engineering discrepencies were generated.

Results--A total of 12 HEDs resulted from this procedure, and these are described fully in Appendix D.

The review of plant operational records revealed some patterns; that is, while the details of each incident differed, there were some cases in which common event patterns either caused or contributed to the incidents. These common event patterns were:

- Difficulty in recognizing the status of a safety system--in one case, the status of the diesel generator interlock. The feedback for the diesel generator logic is not available and the addition of a work aid or status board along with operator training might be helpful.

- The unavailability of scram information on the main control panel caused inadvertent scram of the plant. (This problem has been remedied by putting the scram lights on the main control panel, C-05.)

3.2 CONTROL ROOM INVENTORY

To establish a reference set of data for Monticello's control room design review, a complete inventory was compiled of the instrumentation, controls, and equipment on the main control board and auxiliary panels in the control room. The results of this process were published in "Monticello Nuclear Generating Plant Control Room Design Review--Control Room Inventory" (Interim Report, Vol. II, Parts 1 and 2, Honeywell Inc., Technology Strategy Center, December 1984).

3.2.1 Organization

The inventory specifies both system and human factors data for control room components in a combined format. The component categories, derived from NUREG-0700 categories and standard industry nomenclature, include the following sections:

- Annunciators,
- Controllers,
- Light Indicators,
- Meters,
- Digital Displays,
- Recorders,
- Switches,
- Miscellaneous.

For every component in the Monticello control room, this inventory contains data of the following types:

- Panel location,
- System,
- Instrument number,
- Instrument function,
- Manufacturer and model number,
- Major operational and performance features (for example, meter ranges, switch positions, color codes, sensitivity, accuracy, and calibration parameters).

Each component uses a customized format that is appropriate for that component. Critical categories of component data (i.e., panel number, instrument number, associated system, function label, and functional description) are included for all components to aid later reference and reorganization. All panel numbers are referenced on the control room map in Figure 3-1. Examples of the inventory report are shown in Table 3-6 for meters, switches, and annunicators.

3.2.2 Preparation

This inventory was prepared using a number of resources, including a one-third-scale photo-mock-up of the control panels, the actual control panels, operations manuals, and operator and engineer interviews. The principal intention was to describe the control room configuration as it was when the photomosaic was created in March 1984. For example, component labels are described character for character, without spelling corrections and without changing abbreviations. Additions to the control room since March 1984 were not included in this inventory. All data in this printed copy was organized on a relational data base (initially dBase II, then dBase III) so that corrections and additions could be made by Monticello or other personnel after completion of the DCRDR. The inventory setup also makes it easy to search for key human-factors-related component characteristics as a part of the DCRDR process.

3.3 COMPONENT CHECKLIST REVIEW

The purpose of the component checklist review was to assess control room components for compliance with human engineering performance criteria. This subsection provides a summary of the approach and results of the component checklist review. More detailed information regarding these procedures is available in "Monticello Nuclear Generating Plant Control Room Design Review—Component Checklists" (Interim Report, Vol. III, Parts 1 through 11, Honeywell Inc., Technology Strategy Center, December 1984).

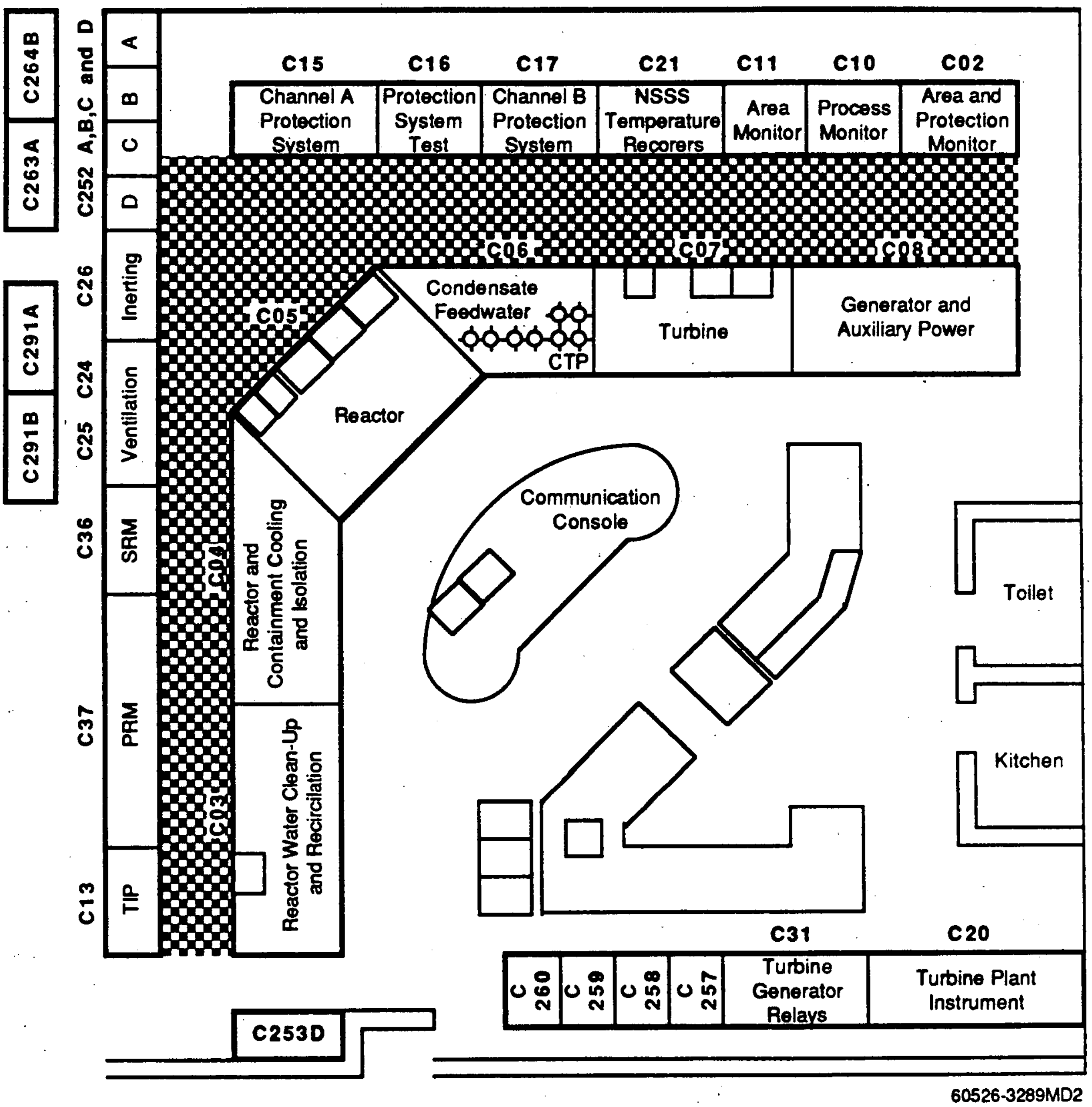

Figure 3-1. Monticello Control Room Layout

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Table 3-6. Examples of Control Room Inventory Report

MONTICELLO ANNUNCIATOR INVENTORY

PANEL	INST NO.	CLR	SYSTEM	LABEL (WINDOW TEXT)	FUNCTION	SETPOINT	DYMO LABEL/COLOR & MISC	
C03	C03-A-01	WHT	APRS	AUTO BLOWDOWN POWER FAILURE	AUTO BLOWDOWN POWER FAILURE	N/A	--	--
C03	C03-A-02	WHT	RHR, RHRSW, SW	RHR SERV WTR PUMPS SELECT MAN OVERRIDE	RHR SERVICE WTR PMPS MAN OVERIDE	MAN OVERRIDE	--	--
C03	C03-A-03	WHT	RHR	RHR I/II DISCH SHTDN HEADERS ON HI PRESS	RHR I/II DISCHARGE SHUTDOWN HDRS	400\100 PSIG	--	--
C03	C03-A-04	WHT	RHR	CONTAINMENT SPRAY PUMP MAN OVERRIDE	CONTAINMENT SPRAY PUMPS OVERRIDE	MAN OVERRIDE	--	--
C03	C03-A-05	WHT	RHR	CONTAINMENT SPRAY FLOW LOW	CONTAINMENT SPRAY FLOW LOW	3500 GPM	3500 GPM	BLK
C03	C03-A-06	WHT	CORE SPRAY	CORE SPRAY I PUMP POWER FAILURE	CS SYS 1 PUMP OR LOGIC PWR FAIL	CORE	--	--
C03	C03-A-07	WHT	HPCI	HPCI STEAM LINE HI DIF PRESS	HPCI STEAM LINE HI DIF PRESS	300,000\150,000 #/HR	300000 LBS/HR	BLK
C03	C03-A-08	WHT	HPCI	HPCI PUMP LOW SUCTION PRESS	HPCI PUMP LOW SUCTION PRESS	15 INCH HG VAC	15 IN HG VAC	BLK
C03	C03-A-09	WHT	APRS	AUTO BLOWDOWN RELIEF VLV LEAKING	AUTO BLOWDOWN RELIEF VLV LEAKING	285 DEG F	285 DEG.F	BLK
C03	C03-A-10	WHT	RHR, RHRSW	RHR Hx A TUBE/SHELL LO DIF PRESS	RHR Hx A TUBE/SHELL LO DIF PRESS	15 PSID	15 PSID BYPASSED WHEN CV-1728 CLOSED	BLK
C03	C03-A-11	WHT	RHR, RHRSW	RHR Hx A OR B HI COOLING WTR TEMP	RHR Hx A OR B HI COOLING WTR TEM	125 DEG F	125 DEG.F	BLK
C03	C03-A-12	WHT	RHR	RHR Hx A OR B DISCH WTR HI TEMP	RHR Hx A OR B DISCH WTR HI TEMP	185 DEG F	185 DEG.F	BLK

Table 3-6. Examples of Control Room Inventory Report (Continued)

MONTICELLO SWITCHES, MAIN BOARDS

PANEL	INSTRUMENT	SYSTEM	LABEL	FUNCTION	POSITIONS	LGT COL	TYPE/HNDL CLR	ADDITIONAL INFORMATION
C03	2E-S5E	APRS	--	RV2-71E BELLOWS LEAKING TEST SW.	TEST NORMAL VENT	NA	THUMB/NA	PERM:E [BLK] RED POSITION LABEL
C03	2E-S6E	APRS	VALVE TEST	RV2-71E	NA	WHT	PB/WHT	DYMO:LEAKAGE BELLOWS COVER LITE]PERM:E (BLK)
C03	2E-S5F	APRS	--	RV2-71F BELLOWS LEAKING TEST SW.	TEST NORMAL VENT	NA	THUMB/NA	FERM:F [BLK]
C03	2E-S6F	APRS	VALVE TEST	RV2-71F	NA	WHT	PB/WHT	PERM:F [BLK]
C03	HS-7189	CORE SPRAY, RHR, RHRSW	ECCS LOOP A FLOW	ECCS LOOP A FLOW	RHR RHR-SW CS	NA	ROTARY SELECTOR/BLK	ASSOC'D W/ FI 7189
C03	HS-7188	CORE SPRAY, RHR, RHRSW	ECCS LOOP B FLOW	ECCS LOOP B FLOW	RHR RHR-SW CS	NA	ROTARY SELECTOR/BLK	ASSOC'D W/ FI 7188
C03	2E-S5G	APRS	--	RV2-71G BELLOWS LEAKING TEST SW.	TEST NORMAL VENT	NA	THUMB/NA	FERM:G [BLK] DYMO:IF BLOWDOWN IS REQUIRED GO TO 800 PSI
C03	2E-S6G	APRS	VALVE TEST	RV2-71G	NA	WHT	PB/WHT	FERM:G [BLK] DYMO:IF BLOWDOWN IS REQUIRED GO TO 800 PSI
C03	2E-S5H	APRS	--	RV2-71H BELLOWS LEAKING TEST SW.	TEST NORMAL VENT	NA	THUMB/NA	FERM:H [BLK]
C03	2E-S6H	APRS	VALVE TEST	RV2-71H	NA	WHT	PB/WHT	PERM:H [BLK]

Table 3-6. Examples of Control Room Inventory Report (Concluded)

MONTICELLO METER INVENTORY

PANEL	INSTRUMENT	SYSTEM	LABEL	FUNCTION	RANGE+UNITS	GRADUATIONS	PRECISION	N-LR	SCALE	ADDITIONAL INFO
C05	FI 6-88A	REACTOR LEVEL CTRL	STEAM FLOW A	A MAIN STEAM LINE FLOW	0 - 2 LB/HR X 10^6	0.5 /0.25 /0.05	2 % FS		VERTICAL	DYMO:6-88A
C05	FI 6-88B	REACTOR LEVEL CTRL	STEAM FLOW B	B MAIN STEAM LINE FLOW	0 - 2 LB/HR X 10^6	0.5 /0.25 /0.05	2 % FS		VERTICAL	DYMO:6-88B
C05	FI 6-88C	REACTOR LEVEL CTRL	STEAM FLOW C	C MAIN STEAM LINE FLOW	0 - 2 LB/HR X 10^6	0.5 /0.25 /0.05	2 % FS		VERTICAL	DYMO:6-88C
C05	FI 6-88D	REACTOR LEVEL CTRL	STEAM FLOW D	D MAIN STEAM LINE FLOW	0 - 2 LB/HR X 10^6	0.5 /0.25 /0.05	2 % FS		VERTICAL	DYMO:6-88D
C05	FI 6-89A	REACTOR LEVEL CTRL	FDWTR FLOW A	FEEDWATER FLOW 'A' LOOP	0 - 4 LB/HR X 10^6	1 /0.5 /0.1	2 % FS		VERTICAL	DYMO:6-89A \TRANSMITTER REQUIRED FOR RCP FW FLOW INTERLOCK [RED]
C05	FI 6-89B	REACTOR LEVEL CTRL	FDWTR FLOW B	FEEDWATER FLOW 'B' LOOP	0 - 4 LB/HR X 10^6	1 /0.5 /0.1	2 % FS		VERTICAL	DYMO:6-89B \TRANSMITTER REQUIRED FOR RCP FW FLOW INTERLOCK [RED]
C05	PI 6-90A	REACTOR LEVEL CTRL, RV&A	REACTOR PRESS A	REACTOR VESSEL PRESSURE	0 - 12 PSIG X 100	2 / 1 /0.2	2 % FS		VERTICAL	DYMO:6-90A
C05	PI 6-90B	REACTOR LEVEL CTRL, RV&A	REACTOR PRESS B	REACTOR VESSEL PRESSURE	0 - 12 PSIG X 100	2 / 1 /0.2	2 % FS		VERTICAL	DYMO:6-90B
C05	7-44A	SRM	SOURCE RANGE MON PERIOD CH 21	SRM CH 21 PERIOD METER	INFINITY - 10 PERIOD SECS	-- / -- / --		Y	VERTICAL	DYMO:12 SECONDS POSITION (-100)MARKED
C05	7-44C	SRM	SOURCE RANGE MON PERIOD CH 22	SRM CH 22 PERIOD METER	INFINITY - 10 PERIOD SECS	-- / -- / --		Y	VERTICAL	DYMO:12 SECONDS POSITION (-100)MARKED
C05	7-44B	SRM	SOURCE RANGE MON PERIOD CH 23	SRM CH 23 PERIOD METER	INFINITY - 10 PERIOD SECS	-- / -- / --		Y	VERTICAL	DYMO:12 SECONDS POSITION (-100)MARKED
C05	7-44D	SRM	SOURCE RANGE MON PERIOD CH 24	SRM CH 24 PERIOD METER	INFINITY - 10 PERIOD SECS	-- / -- / --		Y	VERTICAL	DYMO:12 SECONDS POSITION (-100)MARKED

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3.3.1 Approach

Checklists--The component design review was conducted using a customized checklist procedure in accordance with guidelines contained in NUREG-0700. Checklists were developed for specific components in each control/display category.

The following types of components in the Monticello control room inventory are suitable for component design review using checklists:

- Continuous rotary control;
- Controller;
- Key-operated control;
- Pushbutton;
- Legend pushbutton;
- Round pushbutton;
- Rotary selector--J-handle;
- Rotary selector--Star-handle, thumbswitch, or knob;
- Rotary selector--T-handle;
- Counter;
- Meter;
- Recorder;
- Status light;
- Legend status light.

A separate, customized checklist for each type of component was developed by extracting the relevant items from Section 6 of NUREG-0700. The customized checklists provided exhaustive coverage of all the Section 6 items regarding component design.

Items from NUREG-0700 Section 6 were paraphrased, and references to specific NUREG-0700 guidelines were included in all instances. The checklist format identified component type, panel location, and human engineering guideline compliance for each component. Each checklist item had three possible response categories:

- Comply--The component(s) meets the guideline standard.
- Noncomply--The component(s) does not meet the guideline standard.
- DNA--The guideline does not apply for this component(s).

A copy of the component checklist forms for each of the component types is included in Appendix B.

Procedure--The component checklist review was designed to evaluate components without reference to their specific task performance and operating procedure. The checklist procedure included the following steps:

1. Identify a component on the control board by panel and instrument identification number (or other suitable identification, such as an abbreviated form of the component function label if an identification number was unavailable).

2. Evaluate the component against the checklist item and indicate component compliance, noncompliance, or that the information is unavailable.

3. Identify additional components in the subsystem that match the first instrument number and add those identification numbers to the checklist form.

4. Continue by checking additional examples of this type on each system.

Three sources of information were used in conducting the component checklist review:

- A black and white photomosaic (1:3 scale) of the control panels,
- Full-color slides of the control room panels,
- The actual control room.

Operations at Monticello limited the use of the actual control room; thus, the photomosaic and mock-up were the primary resources.

3.3.2 Results

The completed checklists are available in the interim report cited above. A total of 228 HEDs resulted from the component checklist review process. In some cases, however, the same guideline discrepancy appears several times. HEDs referenced both guideline and component type for the checklist; these HEDs are described fully in Appendices D and E.

3.4 WORK SPACE SURVEY

As a supplement to the component checklist review, the control room systems at Monticello were surveyed. The following aspects of the control room work space were addressed:

- Communications,
- Annunciator warning system,
- Auditory environment and noise,
- Illumination and emergency lighting,
- Control room work space,
- Panel layout and control-display integration,
- Labels and location aids.

For each of these topics, Monticello control room features were compared with the human engineering guidelines contained in NUREG-0700. The survey activities and results are described below by topic. A summary of all HEDs resulting from these survey activities is found in Table 3-7.

More detailed information regarding survey activities and results is available in "Monticello Nuclear Generating Plant Control Room Design

Table 3-7. Summary of Human Engineering Discrepancies Identified During Survey Activities

Survey Topic	Source 0700	Description
Communications	S-13 6.2.1.2(c) (2)	Control room does not have automatic priority of access to switching system within the plant
	S-14 6.2.1.6(a) (2)	Loudspeakers are too low on the turbine and refuel floor
	S-15 6.2.1.6(e) (1)	Speaker volume is not adjustable
	S-16 6.2.1.8(b)	Communications equipment is not usable by personnel wearing protective gear
	S-17 6.2.1.8(c) (1)	Emergency face masks are not equipped with diaphragms that are designed to transmit speech
Annunciator System	S-18 6.3.1.2(a) (1)	Alarms occur too frequently. Prioritization, alarm filtering, or modification of set points should be considered
	S-19 6.3.1.2(b)	Alarms require control room operator to direct auxiliary operator to particular plant location for information
	S-20 6.3.1.2(c) (1)	Annunciators have inputs from more than one plant-parameter set point
	S-21 6.3.1.2(c) (3)	Subsequent alarms do not reactivate sound
	S-22 6.3.1.3(a) (1)	Separate first-out panel for reactor system is not provided
	S-23 6.3.1.3(b)	Separate first-out panel is not provided for turbine-generator system
	S-24 6.3.1.5(a)	No distinct "clear" signal for cleared alarms
	S-25 6.3.2.1(a)	Auditory alarm signal is less than 10 dBa above average ambient noise level
	S-26 6.3.2.1(e)	Annunciator auditory alert only resets after lamp acknowledge. No automatic reset
	S-27 6.3.3.1(a)	Visual alarm panels are not located above related controls and displays
	S-28 6.3.3.1(b)	Panels are not identified by label above panel
	S-29 6.3.3.3(a)	Visual alarms are individually numbered–not organized as a matrix
	S-30 6.3.3.3(b)	Visual alarm tiles not grouped by function
	S-31 6.3.3.3(c) (2-3)	No coordinate designation on left and top sides of annunciator panels
	S-32 6.3.3.3(d) (2)	Tiles within annunciator panel matrix are not grouped by subsystem, function or other logical organization
	S-33 6.3.3.4(a)	Annunciator tile legends sometimes are too long or misspelled
	S-34 6.6.3.4(d)	Inconsistent tile legend abbreviations. Use of same abbreviations–use of different abbreviations for same meanings
	S-35 6.3.3.5(a) (2)	Letter heights on tiles are not uniform
	S-36 6.3.3.5(b) (2)	Tile type styles are not consistent
	S-37 6.3.3.5(b) (3)	Mixed upper and lower case lettering on some tiles
	S-38 6.3.3.5(d) (4)	Spaco between characters on annunciator tiles is less than one stroke width in some cases
	S-39 6.3.3.5(d) (6)	Minimum space between words is sometimes less than one character width on annunciator tiles
	S-40 6.3.4.1(a) (1)	Controls on C06, C07, and C08 do not have full capability for silencing auditory alert
	S-41 6.3.4.1(b) (2)	Alarm acknowledge is possible at points other than just the work station where alarm originated
	S-42 6.3.4.1(c) (3)	Reset control is effective from points other than work station where alarm originated
	S-43 6.3.4.2(a)	Repetitive groups of annunciator controls do not have same arrangement and relative location at different panels
	S-44 6.3.4.2(b) (1-4)	Annunciator response controls are not color coded or shape coded
	S-45 6.2.2.6(a)	Less than 10 dBa auditory signal-to-noise ratio at C05 and C13
	S-46 6.2.2.7(c)	No test capabilities for auditory signal system
Auditory Environment	S-49 6.1.5.5(b)	Background noise levels near panel C17 exceed 65 dBa

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Table 3-7. Summary of Human Engineering Discrepancies Identified During Survey Activities (Continued)

Survey Topic	Source 0700	Description
Illumination	S-47 6.1.5.3(b)	Illumination at C20 and C05 is too low
	S-48 6.1.5.3(a)	Horizontal surfaces of all main control panels are too bright
Work Space	A-2 6.1.1.3(f) (1)	Minimum separation of 50 inches between equipment and opposing surfaces
	A-3 6.1.2.5(a)	Controls should be no higher than 70 inches above the floor
	A-6 6.1.2.5(a)	Controls should be higher than 34 inches above the floor
	A-10 6.1.1.3(c)	Operators should be able to get to any work station without having to overcome obstacles
	A-12 6.8.1.1(a)	Routine tasks should be performed with a minimum of movement between panels
	A-13 6.1.1.3(f) (3)	Minimum separation of 8 feet between opposing panels where more than one person must work
	A-14 6.1.2.5(b) (1)	Displays should be mounted lower than 70 inches from the floor
	A-15 6.1.2.5(b) (1)	Displays should be mounted greater than 41 inches from the floor
	A-51 6.1.2.2	The component is too high for a 5-foot tall woman to reach or control with accuracy, as demonstrated by testing at Monticello
	S-1 6.1.1.3(a)	Bookshelves obstruct view of rear panels
	S-2 6.1.1.3(f)	Unguarded openings in front of panels
	S-3 6.1.1.5(f)	Records of status of expendables and spare parts are not kept
	S-4 6.1.2.2(d)	Standup console controls are beyond reach of small female (fifth percentile). Controls should be no more than 25 inches from the edge of benchboard
	S-5 6.1.2.2(c)	Upper benchboard controls beyond reach of small female (fifth percentile). Benchboard depth put controls outside the reach of a small woman
	S-6 6.1.2.2(d)	Some J-handles are set back less than 3 inches from front edge and are vulnerable to accidental activation
	S-7 6.1.2.5(a)	Controls are located outside an area between 34 inches and 70 inches above the floor
	S-8 6.1.2.5(b)	Displays are located outside an area between 41 inches and 70 inches above the floor
	S-9 6.1.5.2(a)	Air velocities in primary operating area produce a noticeable draft
	S-10 6.1.5.7(a) (2)	Colors in control room are drab and plain
	S-11 6.1.5.7(a) (3)	Folding chairs and simple office chairs do not provide comfortable seating
	S-12 6.1.5.7(a) (5)	No carpet in control room to lessen fatigue of standing and walking
	S-71 6.1.5.5(b)	Distractions could be caused by a radio in the control room

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Table 3-7. Summary of Human Engineering Discrepancies Identified During Survey Activities (Concluded)

Survey Topic	Source 0700	Description
Panel Layout	A-4 6.8.3.3	Mirror-imaging should not be allowed
	A-28 6.9.3.2(a)	Controls should provide capacity to affect the parameter controlled easily, with the required precision
	A-33 6.8.1.1(b)	The master recirculation flow controller is not located near related components on the recirculation system on C04
	A-35 6.8.1.1(b)	The recorder should not be at the upper left corner of C05. It should be located near rod controls for use during start-up
	A-36 6.8.1.1(b)	Recorder should not be on C05, rather, on C04 in recirculation system
	A-37 6.9.1.2(b) (6)	There is no clear connection of the meter with the associated control 152-305/CS-CIRCULATING WATER PUMP C-100A
	A-39 6.8.1.1(b)	The position of this indicator is not near the related system. It should be moved to the C20 panel
	A-40 6.8.1.1(b)	These lights are not located near related equipment. They should be located near the RHR or CS systems on C03
	A-44 6.9.1.1(b)	The controls should not be located so that the display is obscured during control operation
	A-46 6.8.1.1(b)	The FIY 7676 meter should be located on C252A, closer to the associated components
	A-48 6.8.1.1(b)	The power supply is not located near the radiation monitors on this panel
	S-50 6.4.2.2(b)	Controls are not located according to function and should be grouped near related controls
	S-51 6.4.3.1(a)	Pushbuttons should be located in an order related to function or activation sequence
	S-52 6.8.2.2	Arrangement of components does not follow an alphabetic or numerical sequence
	S-53 6.8.2.2	Arrangement of components does not follow an alphabetic or numerical sequence
	S-54 6.8.2.3	Layout of identical components is not consistent at different locations
	S-55 6.8.3.2	Large groups of similar components should be organized into groups of five components or fewer, or labeled with coordinate axes
	S-56 6.9.1.1(a)	Visual displays should be close to their associated controls
	S-57 6.9.1.1(c)	Related displays and controls are not easily associated. Demarcation lines are not complete and mimics are in poor repair
	S-58 6.9.2.1(b)	Sequence of use of components is not an orderly progression
	S-59 6.9.2.2(a,b,c)	Displays should be in matching rows above their respective controls or groups of controls

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Review--Surveys" (Interim Report, Vol. IV, Honeywell Inc., Technology Strategy Center, December 1984).

3.4.1 Communications

This survey was completed to determine if the telephone, intercom, radio, and related systems in the Monticello control room comply with accepted human engineering design practice and provide adequate communication between the control room and remote points. This survey corresponds to Section 6.2.1 of NUREG-0700.

The communication system in the control room provides voice communication with various locations in the plant and the nearby surrounding rural and urban areas. The standard telephone system at Monticello is designed for intraplant communication. The system also has access to the paging system throughout the plant.

Walkie-talkie radios provide direct communication to personnel outside the control room. A repeater is used to improve plant coverage by this equipment.

Communications to the surrounding communities are handled over dedicated telephone lines. The control room personnel can use a direct outside line to avoid switching problems. Various locations in the plant are served by sound-powered telephones in the control room.

Approach--Survey procedures for assessing Monticello communications included control room observations and interviews with plant engineering personnel familiar with and responsible for this equipment. Most equipment was observed during actual control room operation. This information was eveluated with the checklist from NUREG-0700, Section 6.2.1.

Results--The results of these survey activities were recorded on the NUREG-0700 checklist for Section 6.2.1. This completed checklist is contained in the interim report cited above. Four HEDs (code numbers S-13 through S-17) were written based on the results of these survey procedures. Summaries of these HEDs are found in Table 3-7.

3.4.2 Annunciator Warning System

The objective of the survey of the annunciator warning system at Monticello was to review its adequacy as the primary control room interface for alerting operators immediately to out-of-tolerance changes in plant condition. This section of the interim report corresponded to Sections 6.2.2 and 6.3 of NUREG-0700.

The annunciator warning system at Monticello is a conventional fascia-based system with audible devices to signal abnormal process conditions and individually illuminated visual displays containing descriptive legends.

The annunciator warning system is composed of the following three major subsystems:

- The auditory alert subsystem,
- The visual alarm subsystem,
- The operator response subsystem.

Descriptions of the sequence logic pertaining to annunciator operation for each of these subsystems is described below.

Auditory Alert Subsystem--There are two audible devices near the top of the control panels in the control room. One audible device is found inside the C-04-B annunciator panel and signals alarms in the steam supply system; the other device, inside the C-07-B annunciator panel, signals alarms in the balance of the plant. There are additionel speakers inside the C20 and C259 annunciator panels.

The speakers emit two types of sound: one to indicate an alarmed condition and one to signel a cleared condition. The alarm signal is a "high-low" alarm tone that changes frequency about 2 to 3 times a second; the cleared tone is a higher frequency tone that pulses on/off at a higher rate than the alarm. The C20 and C259 alarms do not have a separate cleared alarm sound. For all panels, when there are both cleared and alarm conditions, only the alarm signal is given.

Visual Alarm Subsystem--Fascia panels (Lundell) with illuminated tile windows compose the visual elarm subsystem. All panels, with the exception of the offgas panels (C252) have seven rows of tiles. Five of these panels have 8 columns, 11 panels have 5 columns, and 2 panels have 4 columns of tiles. The two offgas panels have 10 rows of 5 tiles for each panel.

All annunciator windows have translucent white covers. The tiles have two lines of black lettering with the exception of the offgas tiles, which have three lines of text. Annunciators are fitted with two white light bulbs for redundancy, and critical plant systems on C-05 have translucent red gel material to provide a coded output. The panels have hinged doors to safeguard against accidentally relocating individual window covers during bulb replacement.

The Monticello plant uses a dark annunciator panel concept. The initial visual indication of out-of-tolerance process condition is flashing illumination, either red or white. The flash rate for all annunciators is 36 flashes per minute (0.6 flash per second) with approximately equal on and off durations. After the operator acknowledges the lamp, the lights are steady on. When the condition clears, the lights flash at a faster rate (approximately double).

Operator Response Subsystem--There are 11 sets of controls for the operator's use. The controls are located at the base of the benchboard on the main panels or the central area of the vertical panels. Controls are not consistently labeled as part of the annunciator system. All annunciator controls, except the offgas system, include the following:

- Sound acknowledge,
- Lamp acknowledge,
- Test.

The offgas system includes the following controls:

- Acknowledge,
- First out acknowledge,
- Test.

Control position descriptions (that is, the labels for individual buttons) were not standardized.

Sequence Logic--In general, the Monticello annunciator/alarm system is characterized as a nonautomatic reset system. It has visual reflash but not audio resound. There is no first out visuel alarm indication, except in the offgas alarm system. The capability of audio and visual testing and manual reset is provided.

Approach--Information required for the survey of annunciator warning systems was derived from a variety of sources--reference documentation, equipment components, and plant engineers. The following tasks were conducted:

- Review reference documentation, including the annunciator functional description from Lundell Controls;

- Observe the control room and simulator;

- Study the photomosaic and mock-up;

- Observe the control room including sight lines, label sizes, and auditory discriminability.

Results--The results of these survey activities were recorded on the NUREG-0700 checklists for Sections 6.2.2 and 6.3. These completed checklists are contained in the survey interim report. A total of 28 HEDs (code numbers S-18 through S-46) were written based on these survey procedures. Summaries of these HEDs are found in Table 3-7.

3.4.3 Auditory Environment and Noise

This section of the control room survey presents an eveluation of the auditory environment at Monticello. This evaluation details the measurement and analysis of background noise and associated problems in the control room. This subsection corresponds to Section 6.1.5 of NUREG-0700.

The Monticello control room auditory environment may be described by reference to two factors: noise sources and reflective surfaces. Background noise results from the combination of noises and reflective surfaces in an enclosed area. The noise sources in the control room include:

- Control room operators,
- Control room visitors,
- Printers,
- Intercom,
- Annunciator alarms,
- Heating and ventilation systems.

The reflective surfaces include:

- Suspended ceiling,
- Metal control panels,
- Concrete walls,
- Linoleum flooring.

Approach--Sound level measurements were taken during the Boiling Water Reactor Owners' Group Survey, and these data are included here. The instrumentation included a General Radio sound level meter Model No. GR-1933, calibrated with Model No. GR-1562A. These sound level measurements are listed in Table 3-8. In addition, sound leval measurements of the alarms in the control room were made, and these data are included in Table 3-9.

Additional sound level measurements were completed as part of the present survey effort. Instrumentation included a Realistic sound level meter Model No. 42-3019. These sound level measurements are listed on Table 3-10. These survey activities corresponded to NUREG-0700, Section 6.1.5.

Results--The results of both the survey and the resurvey of control room sound levels were recorded on the NUREG-0700 checklist for Section 6.1.5. In both surveys, the control room acoustic environment was satisfactory, except for unsatisfactory levels in a back panel area near a large group of relays. This HED (S-49) is listed in Appendix D and in Table 3-7.

3.4.4 Illumination and Emergency Lighting

The purpose of this survey was to determine if adequate levels of illumination are available in the Monticello control room for task performance. In addition, this survey included data for the emergency lighting system. The survey corresponds to Sections 6.1.5.3 and 6.1.5.4 of NUREG-0700.

The primary ambient lighting system in the control room consists of a ceiling-mounted grid of standard fluorescent lamps. Translucent panels

Table 3-8. BWROG Sound Level Measurements

DATE: 3-13-81 TIME: 0830 BY: DICK BASTIAN AND RAY ROGERS

LOCATION: MONTICELLO NUCLEAR PLANT

TEST SUBJECT: CONTROL ROOM

INSTRUMENTS

SOUND LEVEL METER: ER-1933 SERIAL NUMBER 813

MICROPHONE: A-415 CALIBRATOR: ER 1562A SERIAL NUMBER 6004

REMARKS: CALIBRATED BEFORE AND AFTER TEST

SOUND LEVEL DATA

LOCATION OR POSITION		AVG		OCTAVE BAND CENTERING									
NO.	DESCRIPTION	A	C	31.5	63	125	250	500	1K	2K	4K	8K	16K
1	PANEL C-20 FRNT	62	73	72	67	63	59	67	55	52	45	40	32
2	PANEL C-03 FRNT	61	73	70	67	65	59	59	56	53	45	42	38
3	PANEL C-05 FRNT	62	72	71	64	60	57	57	53	59	44	38	58
4	PANEL C-08 FRNT	61	73	74	63	61	59	62	60	51	47	38	36
5	+PANEL C-17 REAR	72	79	78	69	65	70*	72*	68	64	57	47	46
6	PANEL C-252 REAR	66	77	73	74	66	63	61	61	58	46	40	47
7	OPERATOR DESK	62	72	71	64	60	57	57	53	59	44	38	58

*Noise source is hum from rear panel relays.

+Corresponds to an acoustical noise criterion of NCA-40 to NCA-50; i.e., makes telephone use slightly difficult; normal voice range 3 to 6 feet. Reference: Vancott and Kincade, *Human Engineering Guide*, pp. 193-194, 1972.

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Table 3-9. BWROG Alarm Level Measurements

DATE: 4-1-81 TIME: 0830 BY: DICK BASTIAN AND RAY ROGERS

LOCATION: MONTICELLO NUCLEAR PLANT

TEST SUBJECT: ANNUNCIATOR dB TEST

INSTRUMENTS

SOUND LEVEL METER: ER-1933 SERIAL NUMBER 813

MICROPHONE: A-415 CALIBRATOR: ER 1562A SERIAL NUMBER 6004

REMARKS: CALIBRATED BEFORE AND AFTER TEST

SOUND LEVEL DATA (dB(A))

LOCATION OR POSITION		AVG		OCTAVE BAND CENTERING									
NO.	DESCRIPTION	A	C	31.5	63	125	250	500	1K	2K	4K	8K	16K
1	OPERATIONS DESK EAR LEVEL	64	62	73	62	61	59	58	60	54	57	47	52

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Table 3-10. Sound Level Measurements

DATE: 8-27-84 TIME: 1330

Location	Background Sound Level	Alarm Sound Level	Comment
C03	<60 dB(A)	64 dB(A)	
C05	<60 dB(A)	62 dB(A)	
C07	<60 dB(A)	68 dB(A)	
C08	<60 dB(A)		
C20	<60 dB(A)		
C17	68 dB(A)		RELAYS BUZZING
C252	62 dB(A)		
OPERATORS' DESK	61 dB(A)		

All measurements were made 1 to 2 feet from panel area, 3 feet above floor.

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hang beneath these lamps. This system is the only source of general control room and display illumination.

Emergency lighting is provided by two sources--diesel-generated power and a battery backup system. The diesel generator supplies AC power to the ceiling-mounted fluorescent fixtures. The emergency lighting is as capable as the standard lighting system. Station battery power of 125 volts is supplied to four incandescent lamps recessed in the ceiling during loss of normel and essential AC sources. In addition, the control room has two battery pack lighting units that use a sealed storage battery and an automatic charging system. Loss of normal AC power will automatically turn on the lamps for up to 8 hours.

Approach--Two sets of lighting measurements were used in evaluating the Monticello lighting performance: measurements made in March 1981 during the Boiling Water Reactor Owners' Group Survey and measurements made in August 1984 for the present report.

BWROG Survey--Details of the method of the BWROG survey were not available in the final report. The results of that lighting survey are shown in Figure 3-2. All readings are in footcandles.

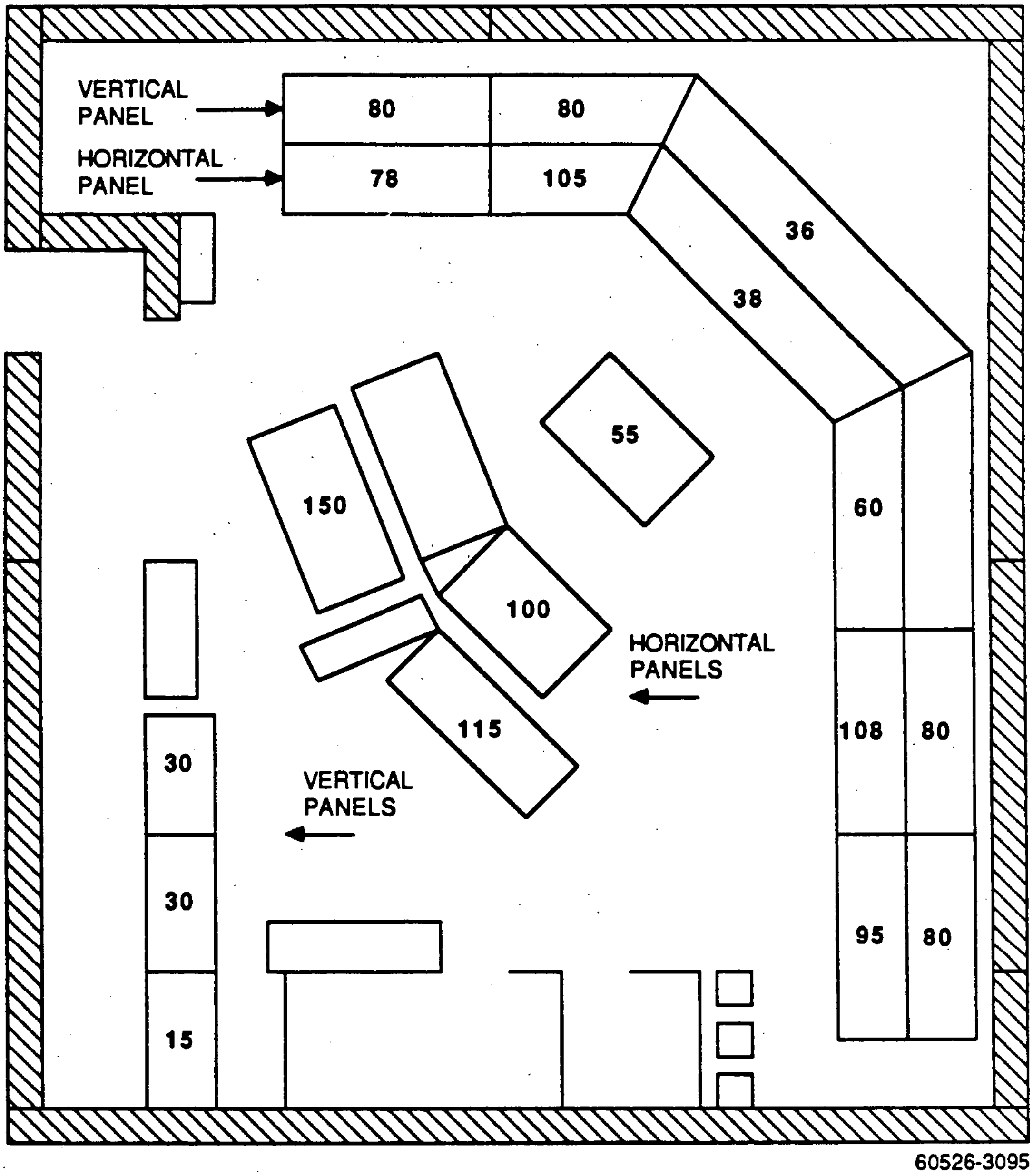
Present Survey--Lighting measurements in the control room were taken using a Spot-Mate hand-held photometer. Readings were taken from a number of different control room locations during normal lighting conditions. Luminance values are presented in Table 3-11. In addition, lighting measurements, lighting indicators, annunciator windows, and label materials are reported in Table 3-12.

Results--The results of both the survey and the resurvey of control room illumination were recorded on NUREG-0700 checklists for Sections 6.1.5.3 and 6.1.5.4, and HEDs were written based on these guidelines. The measurements generated two HEDs (code numbers S-47 and S-48). Summaries of these HEDs are found in Table 3-7.

3.4.5 Control Room Work Space

The purpose of this survey was to determine if the design of the Monticello Nuclear Generating Plant control room is compatible with operator requirements for equipment accessibility and unrestricted movement during performance of control room tasks. The survey was conducted for all areas of the control room, including access pathways and support areas. It corresponds to Sections 6.1.1, 6.1.2, 6.1.3, and 6.1.4 of NUREG-0700.

The main control panel consists of five segments that partially surround the central work space. The control board layout corresponds to the concentric configuration illustrated in NUREG-0700, Section 6.1.1.3(a), Exhibit 6.1-2.



Numbers indicate lighting levels measured in footcandles.

Figure 3-2. Lighting Survey Measurements

Table 3-11. Luminance Values for Normal Lighting Conditions

Panel	Area	Illumination (Footcandles)	Comments
C03	Vertical Horizontal	64.8 99.8	
C04	Vertical Horizontal	52.7 88.4	
C05	Vertical Horizontal	26.4 26.4	
C06	Vertical Horizontal	50.2 66.0	
C07	Vertical Horizontal	56.6 87.0	
C08	Vertical Horizontal	55.2 77.3	
C02		16.4	
C11		36.0	
C15		37.9	
C17		20.9	
C20	Left panel Right panel	9.5 25.1	
C258		62.0	
C36		20.7	Between fluorescent lamps
C37		19.2	Between fluorescent lamps
C252		37.0	Under fluorescent lamps
C264B		20.7	
Operators' Console	Tabletop	41.9	
Computer Table	Tabletop	57.6	
Print Table	Tabletop	91.0	

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Table 3-12. Luminance Values for Control Room Components

Component Type	Location	Measured Value	F1-L (Measured)	Comment
Indicating Light • Red	C03	79.8	21.5	
Indicating Light • Green	C03	229.0	61.8	
Indicating Light • White	C03 C03	342.0 367.0	92.3 99.1	
Indicating Light • Amber	C06 C06	561.0 1120.0	151.5 302.4	
Annunciator Window (Lit) • White	C03 C03	224.0 293.0	60.5 79.1	
• White • Amber • Red	C37 C37 C37	252.0 104.2 15.6	68.0 28.1 4.2	
• White • White • White • White	C252 C252 C252 C252	358.0 50.3 31.6 20.2	96.7 13.6 8.5 5.5	Brightness varies widely across panel
Annunciator Window (Unlit) • White	C03	50.7	13.7	
• White	C252	24.9	6.7	
Annunicator Black Surround	C03 C252	3.5 4.6	0.9 1.2	
Recorder Window	C20 C252	148.0 132.3	40.0 35.7	

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for The main control panel segments are concentrically surrounded by the back panels, which are not visible from the primary operating area.

A communication console (a standard office desk) faces the central, diagonally oriented segment of the main control panel; this allows a panoramic view of the entire main panel. There is a seated work station at the C-05 control panels, although it is used infrequently. (Note: The work stations were changed after the time of the DCRDR review of work space requirements. The HEDs in this report include discrepancies that were identified in fall 1984.)

Approach--The survey is based on information obtained from blueprints supplied by Monticello engineering, a 1/3-scale photo-mock-up of the control panels, and on-site inspection of the plant. Measurements of control room dimensions were made from the blueprints and were cross-checked by referencing the photo-mock-up.

Architectural cross sections were used to evaluate the anthropometric suitability of the control panels. It was assumed that their content is a valid representation of the existing control room. Measurements of physical distances were made from these drawings in most cases. The scales of these drawings were adequate to assure minimum error in determining an HED; however, HEDs were confirmed by measuring the component configuration in the actual control room.

The cross sections of all main panel segments are of identical design. Back panel design is equivalent across the control room, although component placement differs at various back panel locations, as described in the survey. The survey procedure followed the NUREG-0700 guidelines, using plant personnel as advisors when necessary.

Additional steps were taken in the summer of 1986 to evaluate fairly the areas of the main control room that use a sloped benchboard and a vertical panel design. Regular use of the panel by operators of short stature suggested that the requirements in NUREG-0700 were unduly restrictive, because those guidelines indicate that the vertical panel components are beyond the reach of some operators. Although the operators at Monticello do not include individuals as short as a fifth percentile female, Monticello tested the reachability of the panel components with such an individual to better evaluate component placement.

A woman on the Nuclear Technical Services staff (that is, not an operator) who is 5 feet 0 inches tall (fifth percentile height for females) was asked to reach components on the control panel, and her relative success was photo-documented. These photos are included in Figures 3-3 through 3-7. There were some components that she could not reach comfortably; these were included in the list of HEDs in this section.

Results--The results of the control room work space survey activities were recorded on the appropriate NUREG-0700 checklists and, when indicated, HEDs

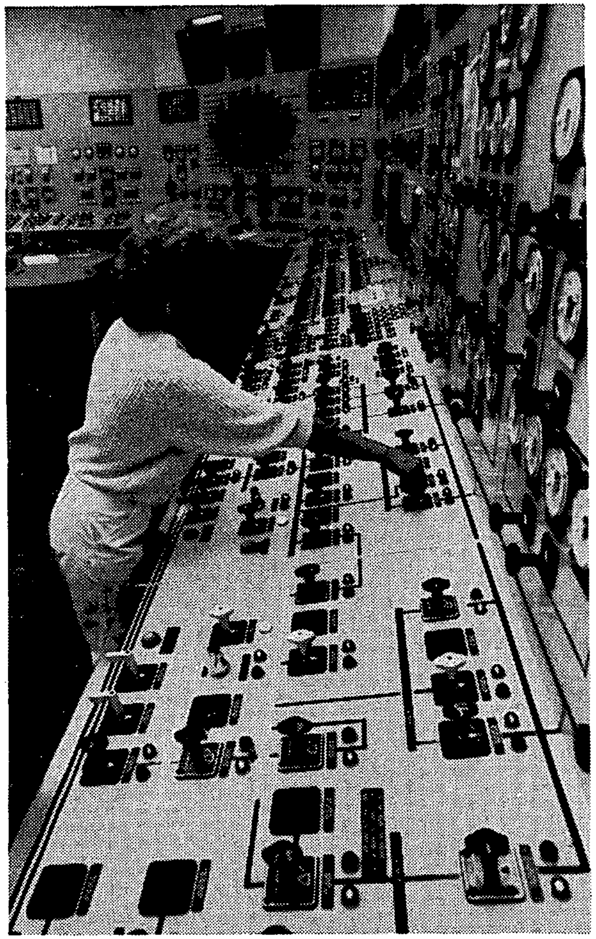

Figure 3-3. Reach Envelope: Top of Benchboard

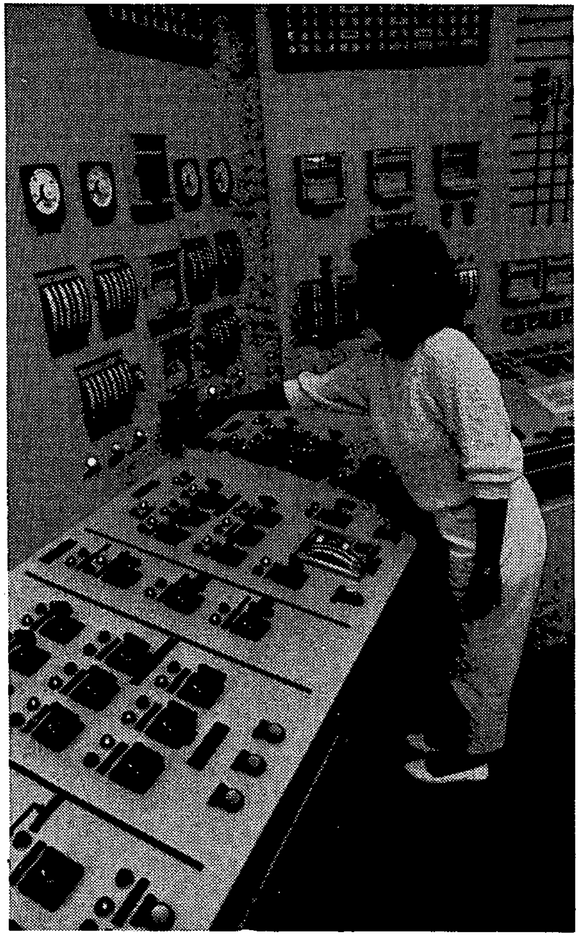

Figure 3-4. Reach Envelope: Low on Vertical Panel

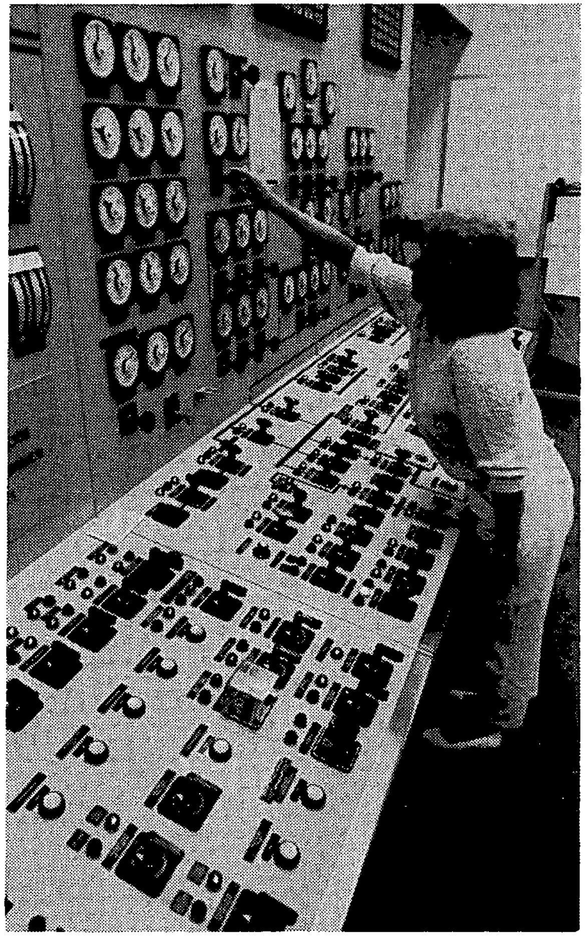

Figure 3-5. Reach Envelope: High on Vertical Panel

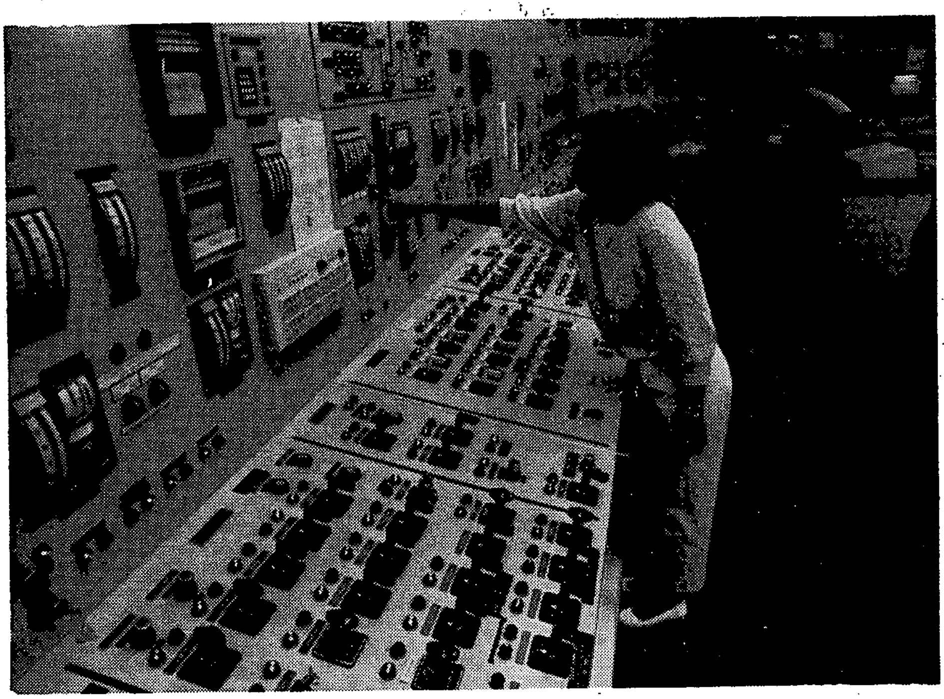

Figure 3-6. Reach Envelope:
Medium on Vertical Panel

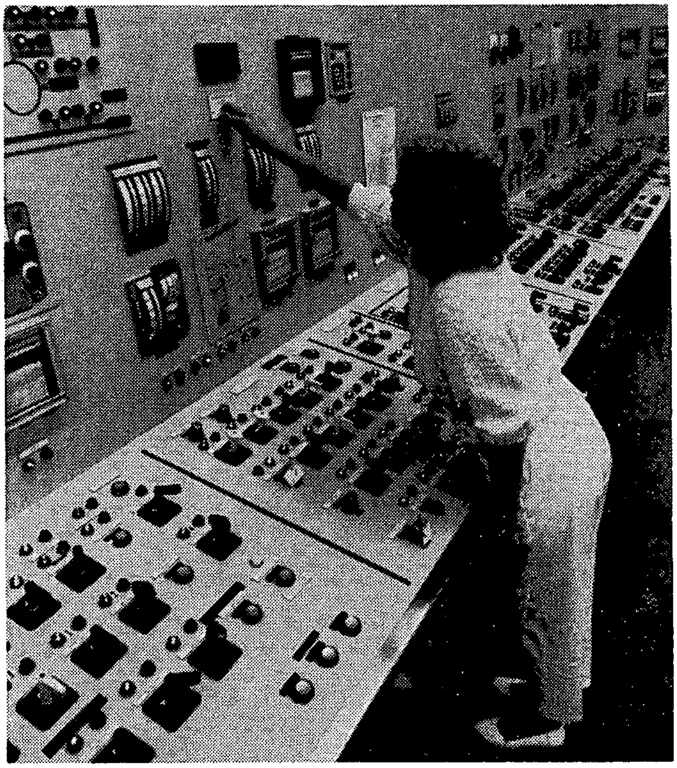

Figure 3-7. Reach Envelope:
High on Vertical Panel

were written. The survey activities generated 20 HEDs (code numbers S-1 through S-12, S-71, A-2, A-3, A-6, A-10, A-13, A-14 and A-15). Summaries of these HEDs are found in Table 3-7.

3.4.6 Panel Layout and Control/Display Integration

The panel layout and control/display survey was designed to evaluate the organization of the controls and displays on the control boards of the Monticello control room. This survey corresponds to Sections 6.8 and 6.9 of NUREG-0700.

The control panels at Monticello are laid out with components in each plant system in the same general panel area. There was not, however, a consistent practice of clearly marking these subsections to define these plant systems. For the multiple plant systems controlled at panels C-03 and C-04, this is especially evident.

On each control panel, manual controls were placed either on the benchboard or on a surface immediately above the benchboard. Displays were placed above the controls on the vertical surfaces of the control boards, with one major exception—valve, motor, and breaker position indicators, which were placed near their respective controls.

Approach--A custom checklist was developed to evaluate control room panel layout and control/display integration. These checklists were completed for each panel of the control room, using the one-third scale photo-mock-up and visits to the control room at Monticello.

During control room visits, operating and engineering personnel were interviewed so that the control/display association could be explained from the perspective of personnel with operating experience in the plant.

Results--Human engineering discrepancies were prepared for all panel items that did not satisfy the stated criteria. These HEDs are summarized in Table 3-7.

3.4.7 Additional Survey Data

Guidelines from NUREG-0700 that were not amenable to survey analysis but could be discussed with plant engineering and operation personnel were included in this review. This subsection supplements the data gathered during the operator interviews and the regular survey activities.

Approach--The procedure used in this activity was to meet with control room personnel and engineers to present them with the guideline, and to ask them to specify control room equipment that was not in compliance with the guideline.

Results--The data from this activity was reviewed with the staff of the Monticello Nuclear Technical Services department and HEDs were prepared, as required. These HEDs are summarized in Table 3-7.

3.4.8 HEDs Identified During HED Compilation and Design Modification

Additional HEDs were identified during the process of compiling, reviewing, and proposing design modifications. These HEDs were entered in a computer file as they were identified. "Monticello Nuclear Generating Plant--Additional Surveys" (Interim Report, Vol. IV, Part 2, Honeywell Inc., Technology Strategy Center, July 1986) summarizes these HEDs. They are listed in Appendix D as HEDs with an "A" code.

3.5 SYSTEM REVIEW AND TASK ANALYSIS

This report described the analysis of the Emergency Operating Procedures (EOPs) at Northern States Power Company's Monticello Nuclear Generating Plant. This review was a task analysis designed to determine if the Monticello control room is sufficiently outfitted with controls and displays to permit the safe and effective use of these procedures. The review focused on determining the information and control needs as expressed in the Emergency Procedure Guidelines and the plant-specific EOPS.

3.5.1 Emergency Procedure Guidelines--System and Functional Analysis

The Emergency Operating Procedures at the Monticello plant were developed from the Emergency Procedure Guidelines (EPGs) with the assistance of the Boiling Water Reactor Owners' Group (BWROG) and the General Electric Company. During the EOP development, the NRC staff met with the representatives of the BWROG EPG and CRDR Committees on May 4, 1984, to discuss the requirements for the documenation of system and functional analyses and information and control needs in BWROG member utilities' CRDR activities.

There was agreement at this meeting that the Revision 3 of the EPGs provided "a functional analysis that identifies, on a high level, generic information and control needs." However, additional CRDR documentation was requested to identify the plant-specific information and control needs in order to determine the adequacy of the existing instrumentation and controls. (Letter from S.H. Weiss to V.A. Moore, "May 4, 1984 Meeting Summary," dated May 14, 1984.)

The EPGs, and the associated background documentation, served as an important resource in completing the task analysis of the Monticello EOPs. The EPG requirements enabled the review team to reference a general description of control room requirements and compare this description to the plant-specific requirements in the EOPs. To facilitate this comparison, the task analysis documentation includes the complete text of the EPGs in parallel with the EOP text. In this manner, the identification of mismatches between EPG and EOP requirements was facilitated.

3.5.2 Emergency Operating Procedures

The EOPs were prepared at the Monticello site according to a development and review plan that included technical verification that the EPG requirements were accurately applied at the Monticello plant. The team that prepared the Monticello-specific EOPs included personnel from the General Electric Company and Monticello engineering and operations personnel. The Control Room Design Review Committee reviewed cases of possibly inadequate instrumentation and controls during the development of the EOPs at Monticello.

The EPGs were designed as a generic guide for the preparation of plant-specific EOPs. A system review analysis was conducted by the Monticello EOP development team to ensure that the Monticello EOPs included all of the capabilities required by the generic EPGs.

The EOP revision that was used for the task analysis was Draft Emergency Operating Procedure, Revision D, completed in June 1985. Much of the review was completed with the Draft EOP Revisions A, B, and C, and the changes in the task analysis followed each revision. The revisions after Revision D have not been of a degree that required major alterations or altered the validity of the associated task analysis.

The procedures listed in Table 3-13 were included in the task analysis. This was a complete set of the procedures available at the time of the review:

Table 3-13. Procedures used in the Task Analysis

EOP Number	Description
C.5-1100	RPV Control
C.5-1101	RPV Level Control
C.5-1102	RPV Pressure Control
C.5-1103	RPV Power Control
C.5-1200	Primary Containment Control
C.5-1201	Torus Water Temperature Control
C.5-1202	Dry Well Temperature Control
C.5-1203	Primary Containment Pressure Control
C.5-1204	Torus Water Level Control
C.5-1300	Secondary Containment Control
C.5-1301	Secondary Containment Temperature Control
C.5-1302	Secondary Containment Radiation Control
C.5-1303	Secondary Containment Level Control
C.5-1400	Radioactivity Release Control
C.5-2001	Level Restoration
C.5-2002	Emergency RPV Depressurization
C.5-2003	Steam Cooling
C.5-2004	Core Cooling Without Level Restoration
C.5-2006	RPV Flooding
C.5-2007	Level/Power Control

The Monticello EOPs are symptom-based procedures, based on the BWROG EPG format. They stress a top-level view of emergency procedure activity, and reference operation of plant systems, rather than control room components. For example, verification of the operation of the emergency core cooling systems (ECCS) was required in the EOPs, but information that detailed how this verification was to be completed was not identified other than by a list of the applicable ECCS systems in each case.

While the top-level format of the EOPs required additional work for the DCRDR task analysis, it can be argued that the format of the procedures supported the effort of maintaining an independent review of the EOPs. That is, if detailed lists of components were referenced in the EOPs, such lists would have prejudiced the identification of information and control needs and connected the task analysis effort directly to the Monticello control room.

3.5.3 Information and Control Needs

The determination of the information and control needs of the EOPs was designed to identify the operator actions that were required to execute the Monticello EOPs and to identify the characteristics of the associated instrumentation and controls that were required to support these operator actions. This effort was consistent with NRC guidance for the identification of plant-specific information and control needs. A procedure was implemented that stressed the identification of information and control needs "independent" of the Monticello control room configuration.

The EPGs developed by the BWROG were the basis of system and function analysis for this determination of operator actions and information and control needs. The EPGs were augmented by reference to plant-specific operating experience and technical requirements. A team of Monticello operations personnel and human factors support personnel were responsible for the specification of EOP requirements.

Monticello used the team approach of Monticello and Honeywell personnel to increase the independence of the review process. The requirement for an independent review was implemented by specifying the information and control needs with a "functional" description whenever possible. This functional description was reached by evaluating the likely state of the plant at that point in the procedure and determining all of the information and actions that the operator(s) would have to gather or execute to complete the procedure.

The team developed some strict requirements for evaluating the language in the EOP steps. For example, the entry conditions implied three kinds of information:

- Alarm data,
- Present indication,
- Trend indication.

With these three types of indication the operator would be alerted to the off-normal condition, could identify the reason for the off-normal condition, or could determine if and when an entry condition had been satisfied.

The team also used a conservative approach in requiring that all components necessary for the completion of the EOPs be located within the control room. For example, if an EOP step referenced steam piping room temperature data, it was assumed that the temperature of all steam piping rooms should be displayed in the control room, whether or not meters were currently available for all of these areas.

In summary, this task analysis demonstrated a careful concern to document EOP information and control needs independent of the Monticello control room. This attention to identifying missing and inadequate components was strongly supported by the number of HEDs that were prepared in the verification activity that listed instrumentation and controls that were not in the control room or did not meet the requirements listed the information and control needs of the task analysis.

Approach--The approach used in the task analysis was to use the EPGs and the plant-specific EOPs as the fundamental documents, supplementing their explanation of the functional requirements of the procedures when necessary. The supplemental documents that were used included plant piping and instrumentation diagrams (P&IDs), operating procedures, and plant test data. The task analysis interim report lists the text of the relevant EPG and EOP step to facilitate their comparison and permit verification that the analysis is based on the generic information and control needs in the EPGs.

A multidisciplinary teem participated in this task analysis. During the first phase of determining the information and control needs, a human factors specialist from Honeywell and a senior operations specialist from Monticello Nuclear Technical Services reviewed the EPGs and the EOPs to detail the parameters necessary to complete the steps in the procedures.

The task requirements were developed by the operations specialist using his extensive background of Monticello operations. The operations specialist was assisted by Monticello operations and instrumentation and control engineering in the collection and specification of information and control needs. The human factors team member organized the data and reviewed the resulting information and control needs. The human factors team member was assisted by several additional support personnel in the collection and documentation of this information.

The determination of information and control needs was a tabletop analysis completed at the Monticello Training Center. The activity included raview of the EPG, EOP, and supplemental documents to specify the operator actions that followed from the procedures. For each step in the EOPs, a worksheet was completed that included the text from relevant EPG step, the text from the EOP step, and the functional description of the operators' information and control needs. In cases where the information and control needs had been described in a previous step, this prior information was referenced by step number. Additional information identifying the relevant Monticello control room components was copied onto the worksheet at this time. Possible HEDs were also included on the worksheet at this time, although the formal effort of evaluating the suitability of the control room instrumentation and controls was reserved for the verification activity (see Section 3.6 of this document). Including it at this time provided an additional means of identifying missing and inadequate control room instrumentation.

Because the procedures as written often did not specify necessary control room information, it was often necessary to review plant systems in detail before completing the description of information and control needs. This review of plant systems was a combined effort of the operations specialist and the human factors specialist. The result was a list of the control room components that were not available in the Monticello control room.

To emphasize, while this review does reference existing plant components, the specification of information and control needs references the function of those components. The review was not based on the existing control room components, but on the general description of the tasks in the EPGs and the EOPs.

The specification of information and control needs included the following data:

- Operator Actions--Details of task data and the specification of necessary system parameters and characteristics;
- Type of Instrumentation (A = Alarm, I = Indicator, T = Trend, C = Control);
- Parameter--Units for indication or system status for control;
- Setpoint or Value--The quantitative value, when available, or system state that is required at that step in the procedure;
- Control (D = Discrete, C = Continuous, M = Manual, A = Auto).

Precision requirements were based on the number of significant digits in the EPG and EOPs during the DCRDR verification activity. Generally, the specification of the accuracy or precision of equipment that was required for the successful completion of the EOPs was determined to be outside the scope of the task analysis. Monticello considered that the plant engineering specifications and plant experience have guided the selection of instrumentation of adequate precision.

Results--The task analysis was completed on all of the EOPs in the manner described in the preceding discussion. The final form of the task analysis was produced by transferring the tabletop analysis worksheets to a computerized spreadsheet format, using the columns of the spreadsheet to identify the EPG and EOP text, information and control needs, and the relevant Monticello components.

Appendix C includes a sample of the task analysis documentation. The information and control needs for the EOP C.5-1100 are listed in their entirety along with the verification data (see Subsection 3.6) for that procedure.

3.6 VERIFICATION AND VALIDATION

3.6.1 Verification and Validation

The evaluation of the information and control requirements with the available control room components used a comparison with the control room inventory and a control room walk-through/talk-through. The documentation includes specification of available control room components cited to fulfill information and control requirements and human engineering discrepencies that list the deviations from NUREG-0700 for these components.

In the second phase of the project, the human factors specialist and the operations specialist continued their involvement. The walk-through/talk-through was completed with the cooperation of three operators. These senior reactor operators each had more than 3 years of experience in the Monticello control room. Monticello instrumentation and controls personnel also assisted in this phase, providing specifications of plant instrumentation.

3.6.2 Component Evaluation Review Procedure

The comparison of the information and control needs with the current Monticello control room was facilitated by the existing inventory of control room components. This inventory was accessed using a computerized data base for the components selected by Monticello personnel to satisfy the information and control needs in the task analysis. In some cases, multiple instruments were selected because Monticello procedures required checking both meters and recorders for reliability when available.

A walk-through/talk-through was also used to evaluate control room component suitability. This procedure was completed in the actual control room during the afternoon shift with experienced Monticello operators, Monticello technical services support, human factors personnel from Honeywell, and a General Electric Company employee representative from the EOP development team.

The team covered the procedures in their entirety, proceeding through each step and reviewing a set of human factors criteria (see Table 3-14) for each step. The results from this walk-through/talk-through were used to generate human engineering discrepencies.

3.6.3 Validation

The EOP development team at Monticello was independent of the DCRDR, elthough it was part of the overall control room redesign effort controlled by the CRDR Committee. This development effort included an independent EOP review that included a verification and validation phase. The DCRDR task analysis did not have a formal validation phase to avoid duplication of effort.

The EOP development included an extensive simulator validation exercise with a human factors specialist from the General Electric Company. A series of events was reviewed that would lead to symptoms matching or exceeding the entry conditions for the procedures. A full complement of operators was used to validate manning requirements, component layout in the control room, and component availability. During this validation procedure a number of improvements were added to the procedures for clarity and usability.

This formal validation phase was the responsibility of the EOP development team; further details are available at the Monticello plant in the documentation for this activity.

3.7 CONVENTION SPECIFICATION REVIEW

The DCRDR included a review of the design conventions for operator interfaces in the control room of the Monticello Nuclear Generating Plant. The outcome was a report that included data for control room components, labels, colors, sceles, and annunciators that will assist in future redesign efforts.

3.7.1 Definition of Convention Specifications

The convention specification standardizes design practices for coding, identification, layout, etc., for the Monticello control room. Some of these design practices were part of the original design of the plant; some have developed from operator's suggestions; others are responses to regulatory action; some are new recommendations.

The convention specification is, in part, an effort to standardize elements of the Monticello control room design that are not specifically covered by NRC guidelines. This is recommended because the design is not consistent in coding or identification, and the layout can vary from good human factors practice even though the selection of each element is relatively unconstrained.

Table 3-14. Checklist for Verification of Component Suitability

NUREG-0700	Description
1. 6.3.3.1(a)	Annunciators should be located near the related displays and controls
2. 6.3.1.2	Annunciator set points should be appropriate
3. 6.3.3.2	Annunciator text should be unambiguous
4. 6.4.1.1(a)	Controls should have adequate range and precision
5. 6.4.1.1(b)	Controls should be simple but effective
6. 6.4.1.1(c)	Control design should be suitable for operators' anthropometric requirements
7. 6.4.1.1(e)	Controls should be intact and undamaged
6. 6.4.1.2(a)	Accidental activation of controls should be prevented where necessary
9. 6.4.2.1	Direction of control movement matches the population stereotype
10. 6.9.1.1(a)	Controls should be located near their related displays
11. 6.9.1.1(b)	Control actuation should not obscure the related display
12. 6.9.1.1(c)	Associations between controls and displays should be clear
13. 6.9.1.2(a)	Arrangement of multiple controls and a single display should be appropriate
14. 6.9.1.2(b)	Arrangement of a single control and a multiple display should be appropriate
15. 6.9.3.2(d)	Feedback from the display should be apparent during control movement
16. 6.1.1.1(a)	Controls and displays should be available for all operating tasks
17. 6.5.1.1(b)	Actual or demand status is clearly identified
18. 6.5.1.2(a)	Scale selection is appropriate for the precision required of an instrument
19. 6.5.1.2(b)	No mental conversion is required
20. 6.5.1.2(d)	Scale range is appropriate on the display
21. 6.5.1.2(e)	Expanded scales are clearly marked
22. 6.5.1.4(f)	Dynamic sensitivity is selected to show a stable indication on the display
23. 6.5.1.4(f)	Transformations are clearly indicated
24. 6.5.1.5(d)	Scales that are to be compared should be compatible
25. 6.5.3.1(c)	System status should be shown by indicator activation, not absence of the indicator
26. 6.5.3.1(d)	Indicators should not be used as annunciators
27. 6.6.2.4(c)	Labels should be visible during operation
28. 6.6.3.8(c)	Control position labels should be visible during operation
29. 6.6.3.2(a)	Label should express the intended action exactly
30. 6.6.1.1	Controls and displays should be labeled appropriately
31. 6.3.1.1	Annunciators should only be used to alert operators of an out-of-tolerance condition
32. 6.1.1.1(b)	Operators should not have to leave the primary operating area during critical operational sequences
33. 6.5.2.2(b)	Pointers should be mounted to avoid parallax errors
34. 6.5.1.4(k)	Recorder design should allow data to be viewed through the window
35. 6.1.2.5	Controls and displays should be mounted at an appropriate height
36. 6.5.1.1(b)	Displays should give operators complete information
37. 6.5.1.6(d)	The meaning of a particular color should be consistent
38. 6.8.1.2	Panel layout should be effective in showing system relationships or task sequences
39. 6.5.2.3	Zone marking should be used where appropriate
40. 6.3.1.2(c)	Annunciators with inputs from more than one plant parameter set point should be avoided

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3.7.2 Approach

The conventions review canvased the entire control room; design variation and design standards were cataloged. Some the design standards in the control room were not used universally, but were used often enough to merit the "convention" designation. Selection of the conventional practice did not necessarily mean that it was the design practice that was used most often; rather, selection included consideration of:

- Systematic use within a panel,
- Use on a main panel rather than a back panel,
- Conformance with NRC guidelines for control room design,
- Conformance with standard human factors principles for design.

The convention specification document includes designs for labels, annunciators, control positioning, component selection, zone marking, scale graduations, and color coding, even though there are guidelines in NUREG-0700 for these topics.

3.7.3 Results

It was the opinion of Monticello plant personnel that the NUREG-0700 guidelines for control room design did not cover all the considerations necessary for a satisfactory control panel design. Particularly important was the need to document control panel design practices at Monticello to facilitate the selection of components in the future. The convention specification documents these design features in a readily understandable form for:

- Control panel additions,
- Control panel enhancements,
- Control room redesign,
- Control panel design consistency verification.

Component Specifications--The following control room components were included in the document (listed here in alphabetical order):

CONTROLLERS	Controller Controller, attached meter
METERS	Meter, rotary Meter, arc Meter, vertical Meter, horizontal
RECORDERS	Recorder, multipoint Recorder, trend

SWITCHES	J-handle, standard
	J-handle, locking
	J-handle, mini
	Key-operated switch
	Oval handle
	Pushbutton, round
	Rotary selector (range switch)
	Rotary selector, continuous
	Star-handle
	T-handle, standard
	T-handle, removable
	Thumb switch
	Toggle switch (channel selector)

For each component, a line drawing was prepared with supporting information designating the manufacturer, serial number, and the appropriate application for that component. The labeling that should be applied to the panel to show component function and related plant data was also included in the line drawings.

Most Monticello control room components were included in the convention specification document. In some cases, individual control room components were not included, because they did not follow the conventional design practice of the balance of the control room.

Label Specifications--A separate label specification section was included in the document to outline labeling practice and recommendations. Labels were specified in this section to facilitate redesign efforts, especially proper placement of labels at each component location.

The new control room convention for labels includes:

- Hierarchical labels organized by system, subsystem, and component;
- Function (component) label;
- Control position indication;
- Breaker number indication (as applicable);
- Sequence number indication (as applicable);
- Instruction label (as applicable).

This recommendation included adding a permanent instrument number label to every component in the control room. In addition, it was specified that labels be engraved and permanently mounted to the control panel or component.

Control position labels were defined for each component type. Positions currently in use at the plant were identified, reviewed, and revised to comply with human factors guidelines for population stereotypes and consistency. These revised control positions were listed for each component having multiple control positions.

Scale Marking Conventions--The convention specifications for scale markings included rules that could be applied to all displays that use graduations to indicate flow, pressure, level, rate, temperature, etc. The diagrems indicated the proper scale divisions, numerical progressions, marking size, and zone markings for the following indicators:

- Meters,
- Recorders,
- Controllers,
- Radiation monitors.

NUREG-0700 recommends zone marking the operating limits of equipment on control room displays. This Monticello convention specification recommends how those zones should be marked. Three operating zones are defined:

- Normal operating range,
- Alarm range,
- Automatic action range.

The identification of the proper alarm limits and automatic action limits must take into account the plant mode that is appropriate for defining the alarm and automatic action ranges. Typically, this would be the normal operation of the plant at full power.

Additional Topics--The convention specification included recommendations for color coding. The colors used most often in the plant were listed with their intended meanings. No major changes in color coding were recommended.

Preliminary ideas for annunciator system redesign were included in the convention specification document. These proposed ideas included concepts for showing system and functional relationships within annunciator panels, as well as requirements for text size and configuration on individual annunciator tiles.

The conventions included an abbreviation and acronymn specification. Monticello has released this abbreviation as a plant document—4AWI-4.9.1. The abbreviations were selected after proposals and review from the Control Room Design Review Committee and supporting plant personnel.

Future additions to this abbreviation list will conform to the following criteria:

- Use ISA conventions (PC, PCV, PI, LI, LR, FS, etc.),
- Use standard system designations,
- Avoid hyphens and conjunctions,
- Avoid periods in abbreviations.

3.8 REVIEW OF REMOTE SHUTDOWN CAPABILITY

Safe shutdown of the Monticello reactor from a location remote from the control room is provided by the remote shutdown panel. This panel was considered within the scope of the control room design review. The objective of the review of remote shutdown capability was to ensure that the functions required of plant personnel are adequately supported by the remote shutdown panel.

Human engineering review of the remote shutdown panel included a previous review of the original design conducted in April 1984. This review substantially altered the original General Electric design, changing switch positions and instrumentation positions to show system relationships and related functions across systems. In all cases, other similarities between the remote shutdown panel and the main control panel were to be maintained. At the time of the panel design, labeling and other enhancement techniques were not used because plans for changes in the control room were not prepared.

This subsection describes the methodology used during the human engineering raview of the remote shutdown panel, its results, and planned enhancement resolutions.

3.8.1 Approach

The human engineering review conducted to evaluate safe operation of the remote shutdown panel followed the methodology of NUREG-0700. Guidelines selected from Section 6 addressed the following topics relevant to the remote shutdown panel:

- Auditory environment and noise,
- Illumination,
- Work space,
- Panel layout and control/display integration,
- Labels and location aids.

Checklists were constructed from the guidelines, and the raview was conducted at the site of the remote shutdown panel by a team of human factors specialists from Honeywell.

3.8.2 Results

Discrepancies from checklist items were detected in severel areas and documented. The principal findings were the following:

- Poor illumination, creating shadows on the panel;
- Poor labeling of meters on the panel;

- Unsatisfactory nomenclature, compared to conventional usage in the control room;
- Absence of dry well pressure indication;
- No laydown or storage space for emergency or normal operating procedures.

3.8.3 Resolutions to Deficiencies

Resolutions to HEDs identified during the review of the ASDS panel followed the same process as that used for other control room panels. Modification to the ASDS control panel will be coordinated with modifications to associated control room panels, matching the ASDS panel to the main control room.

3.9 REVIEW OF COMPUTER SYSTEMS

The installation of improvements in computer monitoring at the Monticello plant was an activity that paralleled the DCRDR. The focus of this computer upgrade was the design and installation of the Safety Parameter Display System (SPDS). This system was developed at Monticello to support both normal and emergency operations and is designed to supplant the previously installed Plant Process Computer system.

The design of the SPDS was a cooperative effort of the Monticello Technical Engineering staff, the DCRDR team, and the Control Room Design Committee. During the progress of the DCRDR, the individual displays of the SPDS were reviewed for good human factors design and the requirements of the EOPs then under development. The location of CRTs in the control room, design of the SPDS keyboard, elternative cursor-control devices, and the operator work station that would house SPDS displays were also reviewed.

A list of recommendations was given to the SPDS coordinator for improving the displays. No HEDs were prepared for the SPDS, however, because the system had not yet been installed and was not available for extensive review.

SECTION 4
HED ASSESSMENT

4.1 ASSESSMENT METHODOLOGY

4.1.1 Objective

The objective of the control room design review activities described in Section 3 was to identify and describe discrepancies from good human engineering design practice and conventions standards adopted in the control room of the Monticello Nuclear Generating Plant. The result is a set of HEDs derived from operator interviews, plant operating experience review, component checklist review, a work space survey, and verification of task performance. Each HED is unique by its description and the source of the data; the list of instruments involved in the control room assigns the HED to components.

The purpose of the assessment procedure is to assign a priority or ranking to indicate the relative importance of the design problem on two issues: plant safety and operator performance. The result of the process is a priority score for each HED that relates its impact on the performance of operators supporting plant safety. The HED assessment process provides a means by which HEDs can be reviewed for validity; the priority score can then be used to assist in control room modification.

Guidance for the assessment of HEDs was available in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," which recommended that:

- The relative degree of degradation of operator performance caused by each HED is adequately assessed.
- The effect on plant safety of each HED is adequately assessed.
- The possible interactions of each HED are adequately assessed.
- The resulting priority for implementing corrective action is appropriate. HEDs that have resulted in errors should have a high correction priority.

This guidance has been used to develop the current assessment methodology that reviews each HED for related documented events, the probability of operator performance errors, and the relationship to plant safety and plant operations.

In addition, HEDs were evaluated for accuracy and possible coverage by the Monticello Convention Specification for Human Engineering Design, resulting in HEDs that were excluded from further consideration in the assessment process.

4.1.2 Overview of the Approach

The HED assessment methodology was comprised of five activities led by the human factors specialist and performed by the human factors team together with a senior operation specialist and the Control Room Design Review Committee. The process was subject to review and approval by the committee.

The five steps of the assessment methodology are outlined below:

- Compilation of HEDs:
  - Compile all HEDs,
  - Prepare computerized data base,
  - Review and supplement HED information;
- Initial categorization:
  - Determine HEDs addressed by the Monticello Human Engineering Design Requirements and Conventions Specification,
  - Create a separate data base;
- Significance rating of HEDs:
  - Develop an instrument for the significance rating,
  - Form assessment rating teams,
  - Perform the rating;
- HED priority categories:
  - Determine a means of assigning priority,
  - Determine priority classification;
- Interactive and cumulative effects:
  - Tabulate HEDs for each instrument,
  - Review interactions and cumulative effects during committee meetings.

The following subsections describe the approach and results of each of the five steps.

4.2 COMPILATION AND PRELIMINARY CLASSIFICATION

This subsection describes how the HEDs were compiled and initially classified.

4.2.1 Compilation of HEDs

As the HEDs were prepared, they were entered into a computerized data base. The growing volume of the data base and the desire for data manipulation, storage and retrieval during HED assessment made a computerized data base a necessity. The HED information was entered into a data base initially using the dBase II (from Ashton-Tate Corporation) data base software package on an IBM-PC/XT computer. The data base was converted to dBase III format when the newer Ashton-Tate product became available.

The data base materials were stored on similarly configured IBM-PC/XT computers at the Honeywell Technology Strategy Center and on an IBM-PC/AT at Monticello Nuclear Technical Services. The structure and contents of this data base are described in Section 2.

The compilation of the HEDs was performed using this data base, identifying the "source" of HEDs and the accretion number for each HED documented during the review. During the creation of the data base, the HED information was reviewed for accuracy, completeness, and consistency. The HED descriptions were expanded, the list of affected components was reviewed, and selected information from the computerized Monticello control room instrument inventory was incorporated for completeness. The result was a complete record of HED and component descriptive information that can be sorted, searched, tabulated, and listed as required for the HED assessment.

Another outcome of the compilation activity was the addition of new HEDs to the HED data base and the removal of HEDs that were judged to be invalid. HEDs identified during this activity are designated with the "A" source code in Appendixes D and E.

4.2.2 Initial Categorization Based on Convention Specifications

Before the rating process began, it was determined that a particular group of HEDs could be identified as appropriate for correction by implementing certain enhancements. This group, which includes topic areas treated in the approved Monticello Human Engineering Design Requirements and Conventions Specification, is concerned primarily with problems in the following areas:

- Inconsistent nomenclature on labels in the control room,
- Nonstandard location of information on labels,
- Poor contrast and readability of labels,
- Scale values and graduations for meters,
- Zone markings on meters,
- Nonstandard color coding practice,
- Inconsistent direction of control movement,
- Lack of identification of discrete control positions.

The data base was reviewed by human factors specialists and the Control Room Design Review Committee to determine which HEDs are addressed by topics in the Monticello Human Engineering Design Requirements and Conventions Specification. A complete description of these HEDs is contained in Appendix D.

4.3 SIGNIFICANCE RATING OF HUMAN ENGINEERING DISCREPANCIES

A systematic method was applied to rate the significance of HEDs in terms of operator performance and plant safety. This subsection describes the significance rating approach and results.

4.3.1 Definition of Safety Significance

Two separate constructs were used to determine the significance of a design problem in the control room:

- The probability of human error associated with the HED,
- The severity of consequences that may result from an error.

Both a finite probability of error and potential negative consequences were prerequisites to defining a discrepancy from control room design guidelines as significant. Therefore, rating the significance of HEDs required an assessment of both error probability and consequences.

Two resources were used to estimate and quantify the probability of human error. Those events attributable to operator error which have been documented as Licensee Event Reports, Significant Operating Event Reports, or other reports provide definitive evidence that an error is possible. In the absence of a documented error, an estimate of the degree of degradation of human performance associated with a certain problem provided an index of the probability of error.

Similarly, a variety of potential consequences of an error were considered for each problem. When an error affects a safety-related system or engineered safety function, it impacts plant personnel safety or the safety of the public. When an error affects the integrity of balance-of-plant equipment, it may impact only plant availability or efficiency.

4.3.2 Methodology for Significance Rating

Developing an Instrument for Significance Rating—The starting point in rating the significance of HEDs was the set of questions contained in NUREG-0800, Appendix A (pp. 18.1-A18-A19). The questions deal with various human performance issues and plant engineering issues, but only as binary decision points. Most items to be considered in rating the significance of HEDs are not amenable to "yes" or "no" answers. These questions and other important issues were reorganized in a new format as rating scales. The scales were organized according to:

- Documented Event/Condition--Whether an operator performance error or operating condition is documented in event reports or reported in operator interviews.

- Operator Performance--The likelihood and impact of potential operator performance errors with respect to physical performance, sensory/perceptual performance, and cognitive performance.

- Emergency Systems/Functions--The consequences for public safety of potential errors induced by an HED.

- Plant Operating Conditions--The consequences for plant operating conditions of potential errors induced by an HED.

A listing of the headings of the items of the HED assessment rating scales is shown in Table 4-1. Complete copies of the HED Assessment Rating Forms are included in Appendix B.

Table 4-1. Headings of Items in HED Assessment Rating Form

Section	Item No.	Heading
1 Documented Event/Condition	1-1	Documented Event
	1-2	Interview Reported Condition
2 Operator Performance	2-1	Fatigue
	2-2	Discomfort
	2-3	Stress
	2-4	Distraction
	2-5	Communication Difficulties
	2-6	Physical Difficulty of Control Operation
	2-7	Misidentification
	2-8	Misreading or Misadjusting
	2-9	Mental Overload
	2-10	Sequential or Compound Errors
	2-11	Delay or Absence of Feedback
	2-12	Excessive Concurrent Task Demands
3 Emergency Systems/Functions	3-1	Emergency Classification
	3-2	Safety Impact
	3-3	Plant Integrity
	3-4	EOP-Related Function
4 Plant Operating Conditions	4-1	Plant Equipment
	4-2	Violation of Technical Specification
	4-3	Plant Availability/Efficiency
	4-4	Personnel Safety

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To organize the assessment questions, they were divided into four sections:

- Documented Errors--Documented conditions or performance errors documented in interviews or event reports.

- Potential for Operator Performance Errors--Likelihood of potential operator performance errors, based on physical performance, perceptual performance, and cognitive performance.

- Safety--Risk and consequences for safe operation of the plant.

- Plant Operations--Risk and consequences for plant operations (power production).

Questions from each of these sections are answered for each HED, as shown in Tables 4-2 through 4-5. There are several alternative answers for each question.

Rating Procedure--It is evident that the instruments in the control room differ with respect to the safety systems and operations-related scales, and occasionally with respect to the operator performance scales. Instruments hold different emergency classification, quality assurance classification, or technical specification categories. Similarly, the potential performance degradation may be more severe for one instrument over another. For this reason, the assessment of an HED cannot be performed for all affected instruments as a group. It was essential to consider each instrument associated with each HED independently of the others that may be included in that HED.

The HED assessment rating was divided between two areas of expertise according to content. A team of two human factors specialists performed the ratings for items in the operator performance category and also recorded the information on documented events/conditions. An operations specialist on site at Monticello performed the rating for the items in the emergency systems/functions and plant operating conditions categories.

The rating process was similar for the two teams. A listing was provided that contained all HED description information (the complete list of HED and instrument combinations) for all HEDs. Another listing showed identification and descriptive information for each of the components involved in each HED.

The raters recorded their responses as subscores on the scoring sheets. The raw scores were entered separately into a dBase III data base then combined together. This data base is available on site at Monticello.

4.3.3 Human Engineering Discrepancy Priority Categories

Once the rating of HED significance was completed, the data was translated into a priority or importance score that summarized the data collected in the individual assessment scores.

Table 4-2. Section 1: Documented Event and Operator Interview Responses

Review each HED to assess if the problem is related to an operational error that was documented in an operating experience report or during the operator interviews. Also, assess whether the problem was identified by operators during the interviews, but was not an operation error.

Item	Description	Scale
1-1	Is the HED a document error or directly related to an operating error?	(NA, N, Y)
1-2	Is the HED a problem that operators have identified?	(NA, N, Y)

NA = Not applicable
N = No impact
Y = True in most cases

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There were a total of 20 scores for each HED. The method that was developed for combining these 20 scores into a priority score was straightforward and closely complied with NUREG-0800.

Referring to the NRC document:

> To aid in assessing significance of HEDs, it is suggested that they be considered by categories. The categories will not only aid in ranking significance, but may suggest the priorities according to which the HEDs are considered for corrective action. The actual scheduling, using some systematic way of determining priorities, should be negotiated with the NRC staff (p. A-17).

The scoring method was designed to "weight" the summary scores in a predictable and accurate manner. The individual scores were translated to summary scores within a scoring matrix. In this scheme, a "high" score can be assigned to an HED because of one or more problems, depending on the category (performance, safety, or operations). In this way, one avoids the possibility of not recognizing an isolated but otherwise important problem.

Table 4-3. Section 2: Operator Performance Definitions and Examples

Item	Description	Scale*
2-1	Fatigue–Physical fatigue, tiring quickly or being excessively tired at end of a task or shift. Due to factors such as: • Strenuousness, duration, or frequency of task • Poorly designed, uncomfortable chairs • Excessive time spent standing on a hard floor	
2-2	Discomfort–Physical or mental discomfort due to such factors as tasks requiring awkward posture or unpleasant working environment. For example: • Noisy, inadequate ventilation system • Glare of lights off control panels • Cluttered, crowded work space	
2-3	Stress–Mental stress. Due to such factors as: • Inability to obtain crucial information • Inability to communicate in emergency situations • Tasks requiring extreme accuracy or tasks associated with serious consequences	
2-4	Distraction–Distraction of personnel from their duties. For example: • Nonessential personnel in control room • Radio playing in control room	
2-5	Communication Difficulties–Factors that impair communication. For example: • Inability to hear or be heard over noise of equipment • Inability to see or be seen when necessary for coordination between operators • Phone system without automatic priority of access for control room	
2-6	Physical Difficulty of Intended Manipulation, or Susceptibility to Inadvertent Activation or Deactivation–Excessive physical force or motor coordination demanded, or placement or design that permits accident activation or deviation. For example: • Control requiring excessive torque to move • Control requiring extremely fine discrimination of pointer position • Pushbutton control that could be mistaken for an annunciator reset button • Unguarded toggle switch at elbow height in narrow passage	
2-7	Misidentification of Component–Operator mistake or confusion about the identity of the system component. Due to such factors as: • Violation of conventions; e.g., steam pump control with a T-handle • Unlabeled component • Unclear legend in annunciator • "Orphan" component in a layout of otherwise related components	
2-8	Misreading or Misadjusting an Identified Component–Operator mistake or confusion about the information conveyed by an identified component, or mistake or confusion about setting or controlling an identified component. For example: • No test bulb on annunciator • No pointer on control • Poor display marking on meter; e.g., too many graduations between numerals • Violation of population stereotypes; e.g., valve with "open" position to the left	

*The impact of each HED on aspects of operator performance was assessed. A four-value scale was used (0 = Low, 1 = Moderate, 2 = Severe, N = Not Applicable).

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Table 4-3. Section 2: Operator Performance Definitions and Examples (Concluded)

Item	Description	Scale*
2-9	Mental Overload–Excessive memory demands, either short or long term, or excessive amounts of information to process. For example: • Unlabeled control positions • Panel layout that does not conform to process sequence • Displays that require mental conversion to obtain values in appropriate units • Meters that do not display values in the appropriate units • No first-out annunciators or too many alarms sounding simultaneously • Inconsistent panel layouts; e.g., adjacent panels that are mirror-imaged	
2-10	Sequential Errors Due to Misinformation, or Absence of Correct Information–Operator has wrong information, or lacks important information, about the state of the system that may lead to incorrect actions (e.g., operator thinks pump is on when it is off). Since almost any error can lead to another, ratings of the severity of the problem are based on two factors: the difficulty of detecting the error and the difficulty of recovering from the error by obtaining correct information. Also includes initial errors due to insufficient information. For example: • No indication of whether demand or actual status is displayed • Meters with insufficient scale range or precision • No control room indication of important information	
2-11	Delay or Absense of Feedback–Lack of necessary direct feedback about control tasks. For example: • Display of demand information rather than status information • Control and associated display on separate panels	
2-12	Excessive Concurrent Task Demands–Unacceptable level of concurrent task demands. For example: • Watching a meter on one panel while manipulating a control on another • Having to fetch a footstool to read a display placed too high on a panel	

*The impact of each HED on aspects of operator performance was assessed. A four-value scale was used (0 = Low, 1 = Moderate, 2 = Severe, N = Not Applicable).

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Our approach was a two-step process, chosen for traceability and clarity:

- Step 1--Assign a summary score for each of the four HED assessment sections.
- Step 2--Assign a priority score for each HED, based on the four summary scores.

These steps are described in more detail in the following subsections.

Section Summary Scores--The four sections used in the assessment procedure were Documented Errors, Probability of Operator Error, Safety Significance, and Operations Significance. Summary scores, calculated for each HED, were determined by combining the scores within each section. Tables 4-6 through 4-9 specify how this was done; it was calculated differently for each section.

Table 4-4. Section 3: Safety Consequences/Background and Questions

Each HED listed for a control room component will have performance problems associated with it. In this section, categorize the relative importance of each control room component, assuming that the HED is serious and could cause an operator error. As a guide, this operator error could be either misidentification or misreading, resulting in an inadvertent or inappropriate control operation.

Item	Description	Scale*
3-1 Emergency Classification	Controls or displays that classify a situation used as an emergency: • General emergency • Site emergency • Alert • Unusual event	(NA, N, Y)
3-2 Safety Impact	Controls or displays that are: • Part of an engineered safety system • Part of a reactor trip function OR • Necessary for the safe shutdown of the plant	(NA, N, 1, 2)
3-3 Plant Integrity	Controls or displays that are associated with maintaining primary or secondary containment	(NA, N, 1, 2)
3-4 EOP Function	A component used in Emergency Operating Procedures	(NA, N, Y)

*NA = Not applicable.
N = No.
1 = Yes, but only in some cases or to a moderate degree.
2 = Yes, in most or all cases or to a large degree.
Y = Yes, no qualification necessary.

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For example, an individual score (i.e., a score on single question) of "2" was translated into either a "high" or "medium," depending on the relative importance of that individual score. In other words, an answer of "2" for certain questions, in and of itself, sometimes merited a "high" summary score. Combinations of answers also suggested placing a particular HED in the "high" or "medium" category. Of course, the summary score for each section was the highest possible score for that HED, based on the answers in that section.

Each HED not covered by convention specification enhancements then had a score of "high", "medium," or "low" for each section:

- Section 1--Documentation,
- Section 2--Probability of Performance Error,
- Section 3--Plant Safety,
- Section 4--Plant Operating Conditions.

Table 4-10 specifies what each of these scores means: in general, a "high" score suggests that the associated HED is related to a documented event, a possible performance error, plant safety, or is central to plant operations, and less so for "medium" and "low."

Table 4-5. Section 4: Plant Operating Conditions/Background and Questions

Each HED listed for a control room component will have performance problems associated with it. In this section, categorize the relative importance of each control room component, making the hypothetical assumption that the HED is serious and could cause an operator error. As a guide, this operator error could be either misidentification or misreading, resulting in an inadvertent or inappropriate control operation.

Item	Description	Scale*
4-1 Plant Equipment	Could misoperation/misreading this component severely damage plant equipment?	(NA, N, 1, 2)
4-2 Technical Specification	Could misoperation/misreading violate a technical specification?	(NA, N, 1, 2)
4-3 Plant Availability	Could misoperation/misreading cause the loss of power production capacity or plant unavailability?	(NA, N, 1, 2)
4-4 Personnel Safety	Could misoperation/misreading cause injury to control room or other plant personnel?	(NA, N, 1, 2)

* NA = Not applicable.
N = No.
1 = Yes, but only in some cases or to a moderate degree.
2 = Yes, in most or all cases or to a large degree.

60526-3235X

Table 4-6. Section 1: Summary Score Compilation

Scores in boxes indicate the value of the summary score–given the individual score. Combinations of scores are valued below. The actual score is the highest score possible.

Item	Topic	Possible Answers	
		No	Yes
1-1	Operating Experience	Low	High
1-2	Interview	Low	Medium

Combination of a lower score with a higher score always yields the higher score.

60526-3236X

Table 4-7. Section 2: Summary Score Compilation

Scores in boxes indicate the value of the summary score–given the individual score. Combinations of scores are valued below. The actual score is the highest score possible.

Item	Topic	Possible Answers		
		No	1	2
2-1	Fatigue	Low	Low	Medium
2-2	Discomfort	Low	Low	Medium
2-3	Stress	Low	Low	Medium
2-4	Distraction	Low	Low	Medium
2-5	Communication	Low	Low	Medium
2-6	Physical Adjustment	Low	Low	Medium
2-7	Misidentification	Low	Low	High
2-8	Misadjustment	Low	Low	High
2-9	Work Load	Low	Low	High
2-10	Sequence Errors	Low	Low	High
2-11	Feedback Problems	Low	Low	High
2-12	Concurrent Tasks	Low	Low	Medium

Combinations:

- High:
  - Two scores of 2, except for pairs among 2-1, 2-2, 2-4, 2-5.
  - Four scores of 1, except for 2-1, 2-2, 2-4, 2-5.
  - A score of 2 on 2-1 through 2-6 or 2-12 and one of the medium combinations.
- Medium:
  - Scores of 1, on 2-1, 2-2, 2-4, 2-5.
  - Three scores of 1.
  - Two scores of 1 on 2-7, 2-8, 2-9, 2-10, 2-11.
- Low:
  - All other combinations.

60526-3237X

Table 4-8. Section 3: Summary Score Compilation

Scores in boxes indicate the value of the summary score–given the individual score. Combinations of scores are valued below. The actual score is the highest score possible.

Item	Topic	Possible Answers		
		No	Yes or 1	2
3-1	Monitoring	Low	Medium	
3-2	Safety	Low	Medium	High
3-3	Containment	Low	Medium	High
3-4	EOP	Low	Medium	

Combinations:

- High = A score of 1 on three or more questions.
- Low = All other combinations.

60526-3238X

Table 4-9. Section 4: Summary Score Compilation

Scores in boxes indicate the value of the summary score–given the individual score. Combinations of scores are valued below.

Item	Topic	Possible Answers		
		No	1	2
4-1	Equipment	Low	Low	Medium
4-2	Technical Specification	Low	Low	High
4-3	Availability	Low	Low	Medium
4-4	Personnel Safety	Low	Low	High

Combinations:

- High = Scores of 2 on 4-1 and 4-3.
- Medium = Two scores of 1.
- Low = All other combinations.

60526-3239X

Table 4-10. Definition of Monticello HED Assessment Summary Scores

Assessment Area	Low	Medium	High
Documentation	No documented problems	Perceived problems by operating personnel	Problems documented during operations
Probability of Performance Error	Low probability of performance error	Moderate probability of performance error	Significant probability of performance error
Plant Safety	Associated equipment is not directly related to plant safety	Associated equipment is moderately related to plant safety	Associated equipment is significantly related to plant safety
Plant Operating Conditions	Associated equipment is ancillary to operations	Associated equipment is important to plant operations	Associated equipment is vital to plant operations

60526-3240X

Priority Score--After summary scores were calculated, there were four scores for each HED (one for each section). These scores could then be combined into a priority score, using the same general approach as for the section summary scores. Section summary scores were assigned a priority based on:

- Recommendations from NUREG-0800 (documented problems should receive high priority),
- Possible impact (safety should be of high importance),
- Probability of occurrence.

The priority scores are described in Table 4-11. Five levels (priority 1 through 5) were proposed and considered as guidance for the modification schedule by the Monticello plant.

4.3.4 Review of Interactive and Cumulative Effects

The purpose of reviewing potential interactive and cumulative effects of HEDs is to determine whether the priority score for one identified discrepancy is affected by others. An HED whose priority score is nonsignificant by itself may have an elevated significance when considered with others as a group.

The problem of interactive and cumulative effects was studied for all HEDs, instead of just the set determined to have some significance. This includes

Table 4-11. HED Prioritization

	Summary Score						Summary Score				
	Documentation	Performance	Safety	Operation	Priority		Documentation	Performance	Safety	Operation	Priority
1	L	L	L	L	5	41	M	M	M	M	4
2	L	L	L	M	5	42	M	M	M	H	4
3	L	L	L	H	4	43	M	M	H	L	4
4	L	L	M	L	5	44	M	M	H	M	4
5	L	L	M	M	5	45	M	M	H	H	4
6	L	L	M	H	4	46	M	H	L	L	4
7	L	L	H	L	4	47	M	H	L	M	3
8	L	L	H	M	4	48	M	H	L	H	2
9	L	L	H	H	4	49	M	H	M	L	3
10	L	M	L	L	4	50	M	H	M	M	3
11	L	M	L	M	4	51	M	H	M	H	2
12	L	M	L	H	4	52	M	H	H	L	2
13	L	M	M	L	4	53	M	H	H	M	2
14	L	M	M	M	4	54	M	H	H	H	2
15	L	M	M	H	4	55	H	L	L	L	1
16	L	M	H	L	4	56	H	L	L	M	1
17	L	M	H	M	4	57	H	L	L	H	1
18	L	M	H	H	4	58	H	L	M	L	1
19	L	H	L	L	4	59	H	L	M	M	1
20	L	H	L	M	3	60	H	L	M	H	1
21	L	H	L	H	3	61	H	L	H	L	1
22	L	H	M	L	3	62	H	L	H	M	1
23	L	H	M	M	3	63	H	L	H	H	1
24	L	H	M	H	3	64	H	M	L	L	1
25	L	H	H	L	3	65	H	M	L	M	1
26	L	H	H	M	3	66	H	M	L	H	1
27	L	H	H	H	3	67	H	M	M	L	1
28	M	L	L	L	5	68	H	M	M	M	1
29	M	L	L	M	5	69	H	M	M	H	1
30	M	L	L	H	4	70	H	M	H	L	1
31	M	L	M	L	5	71	H	M	H	M	1
32	M	L	M	M	5	72	H	M	H	H	1
33	M	L	M	H	4	73	H	H	L	L	1
34	M	L	H	L	4	74	H	H	L	M	1
35	M	L	H	M	4	75	H	H	L	H	1
36	M	L	H	H	4	76	H	H	M	L	1
37	M	M	L	L	4	77	H	H	M	M	1
38	M	M	L	M	4	78	H	H	M	H	1
39	M	M	L	H	4	79	H	H	H	L	1
40	M	M	M	L	4	80	H	H	H	M	1
						61	H	H	H	H	1

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all HED/instrument combinations falling in any priority category--1, 2, 3, 4, or 5. The procedure adopted to study the impact of interactive and cumulative effects included reviewing instruments and controls with multiple HEDs. This review was performed when developing concept alternatives for panel redesign. An indexed list of HED information was compiled and sorted by panel section, system, and instrument number. Multiple HEDs for an instrument were then easily totaled and reviewed. Instruments associated with many HEDs were given special attention for enhancement, retrofit, or redesign.

4.4 DETERMINATION OF RESOLUTIONS

This subsection describes the process for determining resolutions for the assessed HEDs at Monticello.

4.4.1 Categories of Resolutions

Before starting the process of determining resolutions for HEDs, categories were identified to help the reviewers consider all possible means for resolving each discrepancy. It was expected that most resolutions would belong in one or more of the following resolution categories:

- Redesign of control room,
- Enhancement corrections,
- Modification to operating procedures,
- Modification to training curriculum,
- No correction warranted.

4.4.2 Approach

Resolving HEDs was a three-step process. First, a data base was prepared that included HED descriptive information, component identification, and blanks for resolution options and descriptions. Human factors specialists at Honeywell reviewed all of the HEDs, making preliminary modification recommendations for subsequent review and revision by Monticello personnel.

Second, the forms were compiled by HED and distributed to the Control Room Design Review Committee members. Committee members reviewed each HED and instrument within each HED, considering options for correction.

Third, the committee met as a group in successive meetings and discussed the options for correcting all HEDs. Priority classification data was available for review along with the HED description and preliminary recommendations. Consensus was reached on a resolution for each HED, or an action item for conducting additional research was delegated to a committee member who reported at the next meeting. Finally, the modified resolution descriptions resulting from this process were reentered into the data base.

4.4.3 Results

The results of the process of determining HED resolutions are documented in Appendixes D, E, and F. In Appendix E, information about each HED is listed in three sections, organized in the following way:

- The first section contains HED descriptive information. This is printed on a full page.

- The second section contains the list of components included in that HED, together with instrument identification information, assessment rating results, priority category, and a correction code letter. Some HEDs have a list of components that exceeds one page.

- The third section contains the resolution category identification, resolution description information, and correction schedule. Each resolution is identified by a correction code letter that matches those in the second section. This code letter identifies the components for which each resolution applies. (See Section 6 for an explanation of the correction schedule.)

Appendix D lists the HED descriptive information and the resolution information for the HEDs related to the convention specification requirements.

Appendix F is a detailed description of the resolutions for HED T-10.

4.5 JUSTIFICATION FOR NONCORRECTED DISCREPANCIES

The determination of resolutions for HEDs resulted in a category of HEDs judged by the Control Room Design Review Committee to warrant no correction. A variety of reasons justify that no correction be implemented for these HEDs; for example, existing operating procedures address the discrepancy and reduce its severity to acceptable limits, or improvements to the control room have already been implemented that correct the problem. This subsection provides a summary of the HEDs for which no correction is warranted.

Table 4-12 lists nine categories of reasons that justify no correction. One or more of these reasons apply for each HED.

A list of all the HED code numbers for HEDs selected for no correction is presented in Table 4-13 together with the justification code(s) that apply. The correction code for some HEDs identifies which components from the listing in Appendix D are applicable. The list is ordered by the following HED data sources:

- Component checklist (C),
- Interview (I),
- Operating experience review (E),
- Work space survey (S),
- Task analysis (verification) (T).

Table 4-12. Justification Categories for HEDs Selected for No Correction

Justification Code	Justification Category Description
No Observed Problem	Further examination of the discrepancy fails to determine that any problem exists
Existing Procedure	Existing procedure or policy governing operations reduces the problem to limits judged acceptable
No Problems in Operations	Further examination of the discrepancy fails to determine any significant problem, based on operating experience at the Monticello Plant
Existing Improvement	Improvements, which reduce the problem to limits judged acceptable, have already been implemented in the control room
Future Improvement	Future improvements scheduled for implementation in the control room will correct or substantially reduce the problem
Planned Study	Formal study has been planned so that the problem can be evaluated and a resolution can be recommended
Cannot Be Corrected	A correction for the HED is impossible
Conventions	Implementing a correction for the HED would cause a violation of the Conventions Specification and create a more significant problem
Training	Existing training procedures and classroom instruction adequately address the topic of the problem

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Table 4-13. Compilation of HEDs Selected for No Correction

HED	No Observed Problem	Existing Procedure	No Problems in Operations	Existing Improvement	Future Improvement	Planned Study	Cannot be Corrected	Training	Violates Convention Specification
A-2			X						
A-3A			X						
A-3B							X		
A-3C							X		
A-5		X							
A-6A	X								
A-6E			X						
A-6F			X						
A-8		X							
A-13	X								
A-14			X						
A-15			X						
A-16		X							
A-18			X						
A-23		X							
A-25		X							
A-26A			X						
A-26B		X							
A-28A			X						
A-28B			X						
A-34			X						
A-35								X	
A-42			X						
A-44	X								
A-45							X		
A-50								X	
A-51		X							
A-52	X								
A-54			X						
A-55			X						

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Table 4-13. Compilation of HEDs Selected for No Correction (Continued)

HED	No Observed Problem	Existing Procedure	No Problems in Operations	Existing Improvement	Future Improvement	Planned Study	Cannot be Corrected	Training	Violates Convention Specification
C-3		X							
C-4		X							
C-7							X		
C-14			X						
C-21	X								
C-22	X								
C-35							X		
C-45	X								
C-48		X							
C-49		X							
C-50					X				
C-57			X						
C-61							X		
C-76	X								
C-81							X		
C-101							X		
C-102A	X								
C-102C	X								
C-102D				X					
C-126			X						
C-127			X						
C-133		X							
C-138							X		
C-139		X							
C-141		X							
C-155							X		
C-157		X							
C-161							X		
C-163			X						
C-166B		X							

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Table 4-13. Compilation of HEDs Selected for No Correction (Continued)

HED	No Observed Problem	Existing Procedure	No Problems in Operations	Existing Improvement	Future Improvement	Planned Study	Cannot be Corrected	Training	Violates Convention Specification
C-166C								X	
C-171			X						
C-179C			X						
C-179D			X						
C-179E							X		
C-179F							X		
C-180			X						
C-181			X						
C-182A			X						
C-182C					X				
C-187			X						
C-188			X						
C-212									
C-213			X						
C-214			X						
C-217			X						
C-220			X						
I-5A					X				
I-5C						X			
I-16	X								
I-17			X						
I-18			X						
I-19					X				
I-20			X						
I-22							X		
I-23				X					
I-24							X		
I-31							X		
I-35			X						
I-45			X						

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Table 4-13. Compilation of HEDs Selected for No Correction (Continued)

HED	No Observed Problem	Existing Procedure	No Problems in Operations	Existing Improvement	Future Improvement	Planned Study	Cannot be Corrected	Training	Violates Convention Specification
I-46			X						
I-49			X						
I-50			X						
I-51		X							
I-55		X							
I-57					X				
I-58					X				
I-61			X						
I-63			X						
I-68	X								
I-69		X							
I-70								X	
I-71						X			
I-72			X						
I-76			X						
I-77A			X						
I-77B			X						
I-79			X						
I-89	X								
I-97			X						
I-98			X						
I-101				X					
S-5		X							
S-7			X						
S-8							X		
S-18			X						
S-29			X						
S-31	X								
S-50			X						
S-52	X								

60526-3311X

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Table 4-13. Compilation of HEDs Selected for No Correction (Concluded)

HED	No Observed Problem	Existing Procedure	No Problems in Operations	Existing Improvement	Future Improvement	Planned Study	Cannot be Corrected	Training	Violates Convention Specification
S-53	X								
S-59	X								
S-65					X				
S-66			X						
S-67			X						
T-4B	X								
T-4D	X								
T-5	X								
T-7		X							
T-11A			X						
T-11C			X						
T-11D			X						
T-11F				X					
T-13	X								
T-16			X						
T-22A	X								
T-22B			X						
T-25A		X							
T-25B			X						
T-25C			X						
T-26					X				
T-27			X						
T-28	X								
T-30			X						

60526-3312X

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The specific justification for each HED is presented in Appendix D or E in the resolution description.

4.6 SELECTION OF CONTROL ROOM DESIGN IMPROVEMENTS

Resolutions for those HEDs solved by application of the Monticello conventions document were discussed previously. Many of these resolutions involve modification of the control boards through enhancements to the panels, addition of instruments, and redesign of panel layout. This subsection describes the approach taken by the Control Room Design Review Committee to develop effective options for improvements to the control panels.

4.6.1 Objectives

The following objectives were identified to guide the development of control board modifications:

- Modify boards to resolve HEDs.
- Modify boards for compliance with the Monticello Human Engineering Design Requirements and Conventions Specification.
- Modify boards to accommodate near-term computer enhancement projects.
- Ensure that the modified portions of the boards will accommodate future changes.
- Modify simulator board sections prior to or concurrent with modifications to plant board sections.

4.6.2 Approach

A rigorous approach was adopted to conceive, review, and test design concepts that would resolve HED discrepancies and provide improvements for the operating environment. The review process is shown in Figure 4-1.

The following 12 steps defined the procedure for producing design concepts for modifications to the control room:

1. Review the proposed resolution of HEDs pertaining to old design and determine alternatives for implementing corrections.
2. Prepare a preliminary concept design for retrofit of the existing design.
3. Implement the design concept--a full-scale mockup.
4. Conduct a preliminary design review and modification at the full-scale mockup:

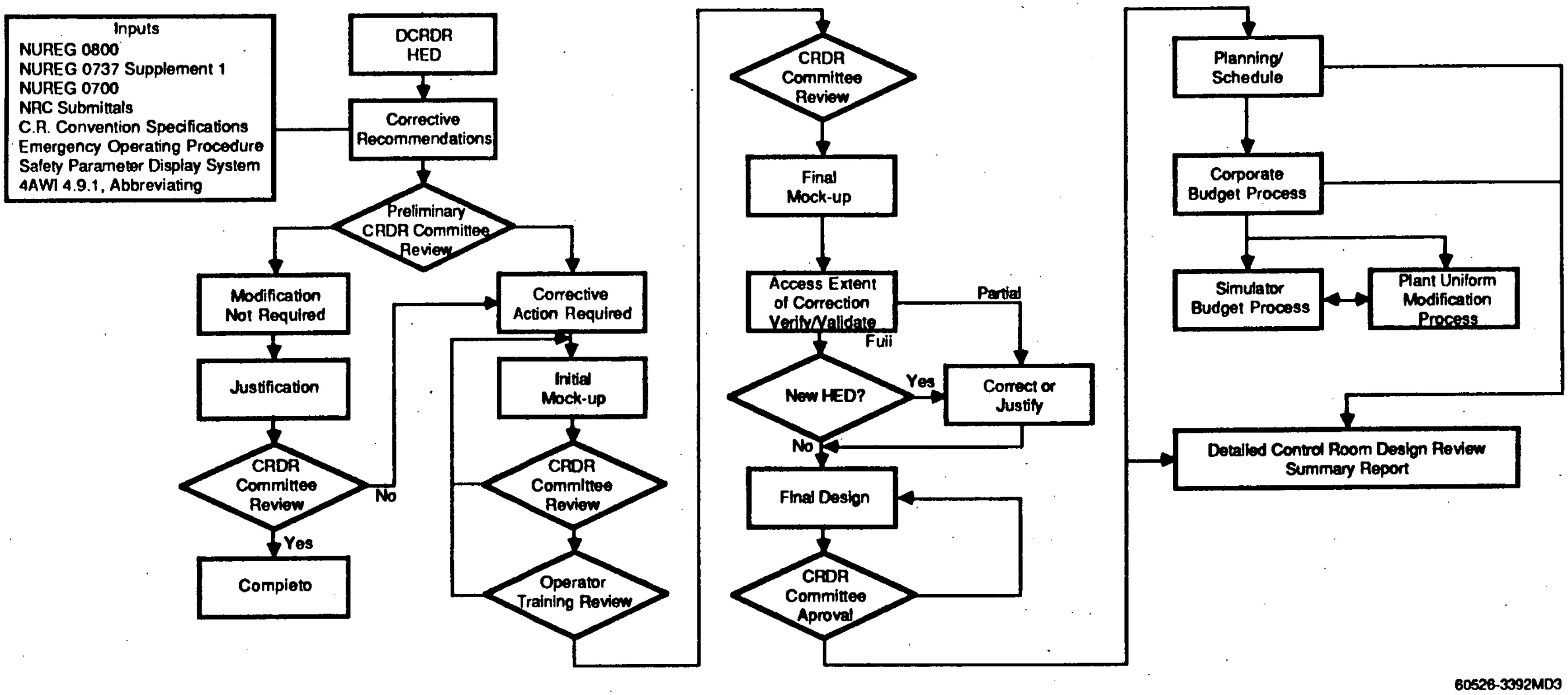

Figure 4-1. Monticello DCRDR HED Resolution Process

- Operating staff,
- Control Room Design Review Committee,
- Human factors review.

5. Modify the design concept on the full-scale color mockup.

6. Conduct further design review and modification:

   - Control Room Design Review Committee,
   - Human factors review.

7. Perform a human engineering review of the design concept (this step is described in Section 5):

   - Component design review,
   - Work space survey,
   - Verification of task performance capability.

8. Prepare cost estimates to redesign and retrofit the control room.

9. Assess the safety consequences of unresolved discrepancies pertaining to the new design.

10. Obtain concurrence on the design concept from plant management.

11. Implement modifications on the Monticello simulator as appropriate.

12. Implement modifications on the plant control boards following the Monticello Uniform Modification Process. (This process includes a human factors review of the details of the modification. Differences between the design concept and the engineering design will be resolved at that time.)

4.6.3 Results

The product of this procedure for developing concepts for control room modifications was most evident in the Monticello control room mockup where the layout of the components was represented in color and full scale. The mockup and supporting materials are available for review at Monticello.

The modifications can be summarized by describing the additions, removal, and rearrangement of instruments on the panel sections in general terms--that is, without reference to instrument numbers. Table 4-14 provides a summary of these proposed panel modifications. Table 4-15 provides a summary of the proposed modifications required to comply with convention specifications for labeling and scaling.

Table 4-14. Proposed Modifications to Monticello Control Room--
New Components and Component Moves

Panel	Modification
C03	Auto Blowdown System 1. Remove individual auto blowdown valve test pushbuttons and mode select thumb switches. Replace with valve selctor switch, single test pushbutton and single keylock mode switch. 2. Add new digital ADS timer. 3. Add demarcation lines. RHR System 1. Realign valve position lights for closer proximity to the valve actuators. 2. Regroup valve actuator switches and pump controls into sequential operating arrangements, and add mimic lines. Core Spray System 1. Regroup valve actuator switches and pump controls into a sequential operating arrangement and add mimic lines. 2. Move ECCS sump pump run lights from panel C06. HPCI System 1. Realign meters to conform to component operating sequence. 2. Change type of flow controller. 3. Realign valve position lights. 4. Regroup valve actuator switches and pump controls into a sequential operating arrangement and add mimic lines. Main Steam 1. Add main steam pressure indicator. 2. Add four main steam flow indicators. 3. Move Group 1 isolation reset switches from panel C05.
C04	RCIC System 1. Realign meters to conform to component operating sequences. 2. Regroup valve actuator switches and pump controls into a sequential operating arrangement and add mimic lines. Atmospheric Control System 1. Remove individual test pushbuttons for vacuum breaker valves and replace with single selector switch and test switch. 2. Regroup valve actuator switches into a sequential operating arrangement. 3. Move fan control from panel C26.

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Table 4-14. Proposed Modifications to Monticello Control Room--New Components and Component Moves (Concluded)

Panel	Modification
C04 (con't.)	Reactor Water Cleanup System 1. Remove temperature selector switch and install three new meters to provide continuous visual indication of all four temperature parameters. 2. Realign meters to same area of panel. 3. Move sample line isolation valve actuators from recirculation section. 4. Regroup valve actuator switches and pump controls into a sequential operating arrangement. 5. Reposition annunciator acknowledge pushbuttons to more open area. 6. Move Group 2 and 3 isolation switches from panel C05. 7. Move valve actuator switch from Atmospheric Control section. Reactor Recirculation System 1. Move Core d/p and total flow recorder from panel C05. 2. Realign meters and indicating lights to functionally group like subsystems within the same panel area. 3. Regroup valve actuator switches and pump controls into a sequential operating arrangement.
C05	1. Move steam flow indication and feedwater controls to better functional arrangement.
C06	1. Regroup valve indicating lights and pump controls for cooling water system into a sequential operating arrangement, and add mimic lines. 2. Move instrument air pressure parameter onto a separate trend recorder from panel C07.
C07	1. Regroup valve indicating lights and pump controls into functional groups.
C20	1. Move heater dump valve indicating lights from panel C06 and place above controllers. 2. Move feedwater heater dump valve control switch from panel C06.
C24A and C24B	1. Change to different style of switches.
C263A and C264B	1. Regroup damper indicating lights and fan controls into an operating arrangement and add mimic lines.

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Table 4-15. Modifications to Comply with Conventions Specification Labeling and Scaling Requirements

LABELING–Provide new labels for all control board instruments (including the Monticello similator) • Standardize label size and positioning • Standardize types and format of information on labels • Comply with approved abbreviations list • Provide hierarchical labelling wherever possible
INDICATOR SCALES–Install new meter scale face-plates for control board indicators (including the Monticello simulator) • Standardize placement of information on scales • Standardize labeling size • Standardize numeric progression, number of labeled graduations, and dimensions of graduation • Comply with approved abbreviations list

60526-3393X

SECTION 5
REVIEW OF PROPOSED CONTROL ROOM MODIFICATIONS

The objective of the proposed redesign of the control room panels was to improve the availability, suitability, and usability of the instrumentation needed to support the operators' tasks. Review of the proposed control room modifications was necessary to ensure that the proposed design improvements provided solutions to the HEDs they were intended to correct and to detect any new discrepancies generated by redesign. To accomplish these purposes, two review activities were conducted:

- Review of existing HEDs to determine whether they are corrected by the new design.

- Human engineering review of the new design to determine whether new discrepancies are created.

The human engineering review of the proposed redesigned panel sections was conducted for each panel using procedures and checklists discussed in this document. A description of the human engineering review process and its results are given in this section.

5.1 REVIEW OF EXISTING HUMAN ENGINEERING DISCREPANCIES

The purpose of the reexamining existing HEDs was to determine whether (or to what extent) they were corrected by the proposed redesign of the Monticello control board panel sections. This subsection describes how the HEDs were compared against the proposed redesign and presents the results of the comparison.

5.1.1 Methodology

The methodology for the general evaluation of the proposed redesign alternatives was an ongoing part of the development of the recommended solutions as prepared and evaluated by the Control Room Design Review Committee. A set of categories was added to the HED data base that summarized the proposed solutions. These categories included the following topics:

- Enhancement,
- Redesign,
- Training,
- Procedural modification,
- No corrective action.

The categorization was completed by Monticello and Honeywell personnel during the development of the modifications and the construction of the control room mock-up. As the committee continued to review alternatives to the planned modifications, these categories indicated whether the modifications would correct the problem.

5.1.2 Results

The data summarized by the modification categories is included in the HED resolution information in Appendixes D and E. Instruments and controls were evaluated individually during this process, but the modification categories are indexed by an HED correction code number that matches each resolution to a group of components.

The data in the modification categories was also used to prepare a set of tables that summarizes the resolution to the existing HEDs for each panel section. In these tables, the modifications are coded by whether they correct ("C") or do not correct ("N") the HED or whether the details of the modification are pending ("P"). The tables appear later in this section.

5.2 HUMAN ENGINEERING REVIEW OF PROPOSED MODIFICATIONS

The human engineering review of the proposed panel redesign entailed three activities:

- Checklist review of new or modified components,
- Review of the convention specification document,
- Verification and validation of task performance capabilities and panel layout factors.

The review activities followed the methodology of NUREG-0700, "Human Engineering Guide for Control Room Design Review." Discrepancies from human engineering guidelines were documented as potential HEDs--that is, problem areas that would be identified as HEDs if the proposed panel redesign was in place in the control room.

5.2.1 Component Checklist Review

The component checklist review was an evaluation of instrumentation, controls, and other control room equipment for human engineering suitability. Characteristics of components were reviewed for design incompatibility with human perceptual, motor, psychological, or size characteristics.

The review was conducted by means of checklists derived from Section 6 of NUREG-0700. A separate checklist was prepared for each of the following component types present in the control room:

- Controller,
- Counter (digital meter),
- Key-operated control,
- Legend status lights,
- Meter,
- Pushbutton,

- Recorder,
- Rotary selector,
- Miscellaneous switches,
- Status lights.

The checklist review was conducted for components that were modified or added to the panel. For components that were moved but not otherwise modified, the results of the previous component design review checklist and survey were considered valid.

It was necessary to make assumptions about the enhancements that were planned for labels, meter scales, etc. Some of these planned changes were not implemented in the control room mock-up. However, Monticello will match control room component design to the uniform design specifications in the Monticello convention specification document as appropriate. The review of the convention specification changes was completed separately from the mock-up.

5.2.2 Review of Convention Specification Document

The review of the Monticello convention specification document was necessary to confirm that the design guide that controls changes and additions to components in the Monticello control room would not introduce any additional HEDs to the control room.

The convention specification was reviewed by comparing it to the NUREG-0700 guidelines for controls, displays, and labels. This comparison resulted in a short list of potential discrepancies with NUREG-0700 if the convention specifications were implemented without modification. The issues included control room color codes and control position consistency. A summary of these discrepancies is included in Table 5-1. A complete list of these potential discrepancies is documented in "Evaluation of Design Conventions Specification Against NUREG-0700 Guidelines," (Interim Report, Volume 7, Part 3, Honeywell Corporate Systems Development Division, November 1986).

Monticello and Honeywell will review the necessary modifications to the convention specifications to resolve these potential discrepancies.

5.2.3 Verification and Validation of Task Performance and Panel Layout

A verification and validation of task performance was conducted to determine whether control room components and functions allocated to the control room operating crew could be accomplished effectively within the structure of defined operating and emergency procedures. Task sequences generated from plant-specific EOPs and documented in the Monticello task analysis report were used as a basis for evaluating the proposed panel redesign. The EOPs used for this process were the same ones used for the control room design review. They are listed in Table 5-2.

Table 5-1. Potential Discrepancies Resulting from Proposed Panel Redesign

Review Activity/Topic	Potential Discrepancy
Mock-up Review/ Demarcations and Mimics	• Flow direction should be indicated in all cases • Components should be clearly connected to the flow path on the mimic • More than four parallel lines should be avoided • Flow paths should be divided into primary and secondary paths whenever possible
Mock-up Review/ Label Enhancements	• Nonstandard abbreviations should be avoided • Function label position should be standard • Text fonts should conform to a standard font style
Mock-up Review/ Control Layout	• Feedwater controls were not directly above the feedwater controller • ATWS reset pushbuttons were not grouped together or in alphabetical order
Convention Specification Review/Color Coding	• Red, green, and amber should be reserved for special safety applications: – Amber lights used for large motor monitor indication – Red and yellow labels used for system indication – Green handles used for drywell controls • Color should be used consistently – Blue lights used for "neutral" indication – Blue handles used for torus controls
Convention Specification Review/Labeling	• Control positions should be consistent. "MAN" and "AUTO" are different positions for thumb switches and all other controls

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A limited set of plant-specific Normal Operating Procedures (NOPs) was also used to evaluate the redesign as shown on the mock-up. A preliminary review of the content of the EOPs (using the task analysis) indicated that some components on both the main and back panels were not needed for successful completion of the EOPs. To investigate the requirements and suitability of the instruments on these panels, the NOPs that involve these panels were used. The selected NOPs are listed in Table 5-2.

The validation process used the full-scale, color mock-up of the control room containing the proposed panel redesign. Checklists of applicable items from NUREG-0700, Section 6, were used for the evaluation. The specific information and control requirements for successful completion of this step were identified and recorded on the checklist forms. See Table 5-3 for a listing of the guidelines that were used to evaluate these components.

A walk-through, talk-through procedure was followed. There were two participating subject matter experts: a Nuclear Technical Services staff member (who holds a Senior Reactor Operator license and has served as instructor including EOP training at Monticello) and an EOP development team member. The EOP expert read aloud each task involving the specific panel. He and the NTS staff member identified and described the actions to perform the task, information sources used, controls and displays used, expected system responses, and the alternative actions that could be taken if expected responses were not observed. During the walk-through, talk-through procedure

Table 5-2. Selected Emergency and Normal Operating Procedures

Procedure Number	Title
Emergency Operating Procedures	
C.5-1100	RPV containment
C.5-1101	RPV level control
C.5-1102	RPV pressure control
C.5-1103	RPV power control
C.5-1201	Suppression pool temperature control
C.5-1202	Dry well temperature control
C.5-1203	Primary containment pressure control
C.5-1204	Suppression pool water level control
C.5-1300	Secondary containment control
C.5-1301	Secondary containment temperature control
Normal Operating Procedures	
C.1 (p. 19)	Start-up
C.4 (p. 82)	Start-up
B.4 (p. 96)	EFT emergency air supply containment at control

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each specific component was evaluated for compliance with the checklist guideline items. A criterion of agreement or nonagreement was applied to each item. For each discrepancy, the instrument number and the related EOP step was noted, using the notation for EOP steps developed during the task analysis.

A detailed description of the procedure and the results of this review activity can be found in the interim report, "Monticello Nuclear Generating Plant Control Room Design Review--Review of Proposed Panel Redesign" (Interim Report, Vol. VII, Part 2).

5.2.4 Results

The human engineering review of the proposed panel redesign was a comprehensive evaluation of all the elements of the control room affected by panel redesign, including the new components and rearranged panel layout. The result is a set of discrepancies that indicates potential HEDs that could affect the redesigned panels. They were summarized in Table 5-1.

5.3 CONCLUSIONS

5.3.1 Disposition of Existing Human Engineering Discrepancies

This section summarizes the results of the review of existing HEDs across panel sections.

Table 5-4 through 5-38 contain a list of HEDs that pertain to the panel sections as they currently appear in the control room. The main body of each table shows whether each HED would be corrected by the proposed redesign of each panel section. An HED is considered corrected by the proposed redesign when the problem cited for every instrument in every panel involved in that HED no longer exists. This is designated by the letter "C" in the column headed "Overall." An HED is considered pending ("P") when the specific plans for modifying instruments or controls is not complete at the time of this report. An HED is not corrected ("N") if the new design provides no significant improvement over the existing design of any panel involved. Combinations of letters (e.g., "CN") indicate that both cases apply for that HED for that panel section. No letter entry in the column indicates that the HED does not apply for that particular panel.

5.3.2 General Discrepancies

A number of the existing discrepancies apply generally to one or more panels in the control room and cannot be resolved by the redesign of any one panel alone. Those HEDs relate to the following:

- Glare is generated from overhead lighting on the cover glass of components such as the multipoint trend recorders, computer trend recorders, and meters.

Table 5-3. Redesign Review Guidelines

Guideline	Category	Description
6.5.1.1(e) (1)	Display	Displays should be identified
6.5.1.2(a)	Display	Scales should be precise
6.9.3.2(c)	Display	Scales provide appropriate precision
6.5.1.2(b)	Display	No conversion required with scale
6.5.1.2(d)	Display	Scales should have complete range
6.5.1.2(e)	Display	Supplies range mutliplier with power of 10
6.5.1.5(d)	Display	Multiple scales should be compatible
6.4.1.1(a) (1)	Control	Each control should be adequate
6.4.1.1(a) (2)	Control	Control should be simply operated
6.4.1.1(b) (3)	Control	Control precision should be adequate
6.4.1.1(c) (1)	Control	Control should be functionally coded
6.4.1.1(e) (2)	Control	Control should have required feedback
6.4.1.2	Control	Accidental activation minimized
6.4.1.2(f)	Control	Preceding sequential controls locked
6.4.1.2(g)	Control	Pushbuttons or rotary switches protected
6.4.2.1	Control	Control movement should be stereotypical
6.6.3.8(c)	Label	Labels should be visible
6.6.2.4(c)	Label	Control activation should not cover label
6.1.1.1(a)	Validation	Displays/controls necessary, available
6.1.1.2	Validation	All necessary manpewer is present
6.1.1.3(c)	Validation	Operators should not have obstructions
6.1.3.1(a)	Validation	Movement patterns should be clear
6.8.1.1(a)	Validation	Control location minimizes movement
6.8.1.3	Validation	Recognition and identification enhanced
6.1.2.2(e) (2)	Validation	Display/control within viewing angle
6.4.3.1(a)	Layout	Pushbuttons should be in logical order
6.8.2.2	Layout	Controls/displays arranged logically
6.8.2.3	Layout	Functional groups should be similar
6.8.3.2	Layout	Component group of more than 5 should be separated
6.9.1.1(a)	Layout	Display should be close to control
6.9.1.1(b)	Layout	Display not obscured when using control
6.9.1.1(c)	Layout	Related controls are easily associated
6.9.1.2(a)	Layout	Multiple controls/one display guideline
6.9.1.2(b)	Layout	One control/multiple displays
6.9.1.2(c)	Layout	Good display selectors used
6.9.2.1(a)	Layout	Multiple control/display grouped together
6.9.2.1(b)	Layout	Sequence: left/right, top/bottom, and reading
6.9.2.2	Layout	Control/display arrangement consistent

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Table 5-4. HED Summary for Panel C-03

Checklist		Checklist (concluded)		Interview		Survey		Verification	
C-15A	(C)	C-124A	(C)	I-14	(C)	A-1A	(C)	T-1	(P)
C-16A	(C)	C-128A	(C)	I-17	(N)	A-2	(N)	T-2	(P)
C-21	(N)	C-130A	(C)	I-19	(N)	A-17A	(P)	T-3	(P)
C-23A	(N)	C-133A	(C)	I-20	(N)	A-29	(C)	T-4A	(P)
C-25A	(C)	C-134A	(C)	I-22	(N)	A-45A	(N)	T-7A	(C)
C-26	(C)	C-136	(C)	I-25	(P)	A-51	(N)	T-10	(P)
C-27	(C)	C-137A	(C)	I-27	(C)	A-54A	(N)	T-11A	(N)
C-28A	(C)	C-138	(N)	I-30	(P)			T-12	(C)
C-29A	(C)	C-139A	(N)	I-33	(C)	S-6	(C)	T-13A	(N)
C-32A	(C)	C-140	(C)	I-38	(C)	S-18	(N)	T-14A	(N)
C-33A	(C)	C-148A	(C)	I-48	(C)	S-20A	(P)	T-15	(N)
C-34A	(C)	C-149A	(C)	I-58	(N)	S-39	(P)	T-17	(P)
C-35	(N)	C-151	(C)	I-59	(P)	S-51	(C)	T-19	(P)
C-36	(C)	C-153	(C)	I-64	(C)	S-52A	(N)	T-20A	(C)
C-37	(C)	C-154A	(C)	I-68A	(N)	S-56	(C)	T-21	(P)
C-38A	(C)	C-168A	(C)	I-74B	(C)	S-58	(C)	T-29	(C)
C-58A	(C)	C-170A	(C)	I-76	(N)	S-62	(N)		
C-60A	(C)	C-173	(C)	I-92	(C)	S-65	(N)		
C-61	(N)	C-174A	(C)	I-104	(C)				
C-63	(C)	C-175A	(C)						
C-67A	(C)	C-176	(C)						
C-76A	(C)	C-177A	(C)						
C-77A	(C)	C-178A	(C)						
C-78A	(C)	C-179A	(C)						
C-79	(C)	C-179E	(N)						
C-80A	(C)	C-181A	(P)						
C-81	(N)	C-182B	(C)						
C-82A	(C)	C-183A	(C)						
C-83	(C)	C-184A	(C)						
C-84	(C)	C-186A	(C)						
C-86A	(C)	C-191A	(C)						
C-88A	(C)	C-196	(C)						
C-93	(C)	C-198A	(C)						
C-94A	(C)	C-201A	(C)						
C-98A	(C)	C-202A	(C)						
C-100A	(C)	C-203A	(C)						
C-101	(N)	C-205	(C)						
C-102D	(N)	C-208A	(C)						
C-103	(C)	C-210	(N)						
C-105A	(C)	C-214	(N)						
C-106A	(C)	C-222A	(C)						
C-107A	(C)	C-223A	(C)						
C-108	(C)	C-224A	(C)						
C-110A	(C)	C-228A	(C)						
C-114A	(C)								

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

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Table 5-5. HED Summary for Panel C-04

Checklist	Checklist (continued)	Checklist (concluded)	Experience	Interview	Survey	Verification
C-8A (C)	C-105A (C)	C-175A (C)	E-01 (C)	I-24 (N)	A-1A (C)	T-1 (P)
C-11 (C)	C-107A (C)	C-177A (C)		I-35 (N)	A-17A (P)	T-2 (P)
C-14A (N)	C-108 (C)	C-178A (C)		I-72A (N)	A-28A (N)	T-3 (P)
C-15 (C)	C-109A (P)	C-179D (N)		I-74A (C)	A-38A (C)	T-7B (C)
C-15A (C)	C-110A (C)	C-179E (N)		I-78 (C)	A-45A (N)	T-8 (C)
C-16A (C)	C-111A (C)	C-181A (P)		I-87 (P)	A-54A (N)	T-11D (N)
C-23A (N)	C-113A (C)	C-182B (C)		I-93 (C)		T-12 (C)
C-25A (C)	C-114A (C)	C-183B (C)			S-6 (C)	T-14A (N)
C-26 (C)	C-124A (C)	C-184A (C)			S-18 (N)	T-19 (P)
C-27 (C)	C-125 (C)	C-186A (C)			S-20A (P)	T-20A (C)
C-28A (C)	C-126 (N)	C-189A (C)			S-54A (C)	T-24 (P)
C-29A (C)	C-127 (N)	C-190A (C)			S-60 (C)	T-28A (C)
C-32A (C)	C-128A (C)	C-191A (C)			S-64 (C)	T-28B (N)
C-37 (C)	C-129 (C)	C-194A (C)			S-69 (C)	T-29 (C)
C-38A (C)	C-130A (C)	C-198A (C)				
C-60A (C)	C-131 (C)	C-201A (C)				
C-61 (N)	C-132 (C)	C-202A (C)				
C-63 (C)	C-133A (C)	C-203A (C)				
C-64 (C)	C-134A (C)	C-207 (C)				
C-65A (C)	C-136 (C)	C-208A (C)				
C-77A (C)	C-137A (C)	C-212 (N)				
C-80A (C)	C-138 (N)	C-214 (N)				
C-81 (N)	C-139A (N)	C-217 (N)				
C-83 (C)	C-140 (C)	C-221A (C)				
C-86A (C)	C-148A (C)	C-222A (C)				
C-88A (C)	C-153 (C)	C-223A (C)				
C-92A (C)	C-166A (P)	C-224A (C)				
C-98A (C)	C-168A (C)	C-225 (C)				
C-100A (C)	C-171A (N)	C-228A (C)				
C-101 (N)	C-172 (C)					
C-103 (C)	C-174A (C)					

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

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Table 5-6. HED Summary for Panel C-05

Checklist		Checklist (continued)		Checklist (concluded)		Experience		Interview		Survey		Verification	
C-15	(C)	C-101	(N)	C-164	(C)	E-11	(C)	I-4	(C)	A-1A	(C)	T-1	(P)
C-15A	(C)	C-102A	(N)	C-165	(C)	E-12	(C)	I-37	(C)	A-17A	(P)	T-2	(P)
C-16A	(C)	C-103	(C)	C-166A	(P)			I-38	(C)	A-21	(C)	T-4B	(N)
C-23A	(N)	C-104	(C)	C-168A	(C)			I-47	(C)	A-28A	(N)	T-4C	(P)
C-25A	(C)	C-105A	(C)	C-169	(C)			I-54	(C)	A-29	(C)	T-7D	(N)
C-29A	(C)	C-107A	(C)	C-170A	(C)			I-57	(N)	A-30	(P)	T-9	(C)
C-31	(P)	C-108	(C)	C-171A	(N)			I-58	(N)	A-33	(C)	T-11D	(N)
C-32A	(C)	C-116	(C)	C-174A	(C)			I-71	(N)	A-34	(N)	T-12	(C)
C-33A	(C)	C-117	(C)	C-178A	(C)			I-72B	(C)	A-35	(N)	T-14B	(C)
C-37	(C)	C-118	(C)	C-179A	(C)					A-38A	(C)	T-16A	(C)
C-38A	(C)	C-119	(C)	C-181A	(P)					A-45A	(N)	T-16B	(N)
C-42	(C)	C-120	(C)	C-182B	(C)					A-53	(C)	T-19	(P)
C-43	(C)	C-121	(C)	C-183A	(C)					A-54A	(N)	T-20A	(C)
C-44	(P)	C-124A	(C)	C-184A	(C)							T-21	(P)
C-46	(C)	C-128A	(C)	C-185	(C)					S-19	(P)	T-23B	(P)
C-52	(C)	C-128B	(C)	C-186A	(C)					S-20A	(P)	T-24	(P)
C-53	(C)	C-133A	(C)	C-189A	(C)					S-33	(C)	T-28B	(N)
C-54	(C)	C-134A	(C)	C-191A	(C)					S-47	(P)	T-28C	(C)
C-55	(C)	C-137A	(C)	C-192A	(C)					S-50A	(C)		
C-56	(C)	C-138	(N)	C-197	(C)					S-50B	(N)		
C-57	(C)	C-139A	(N)	C-198A	(C)					S-51	(C)		
C-58A	(C)	C-140	(C)	C-200	(C)					S-52B	(C)		
C-67A	(C)	C-145	(C)	C-201A	(C)					S-52C	(C)		
C-77A	(C)	C-146A	(C)	C-202A	(C)					S-54B	(C)		
C-78A	(C)	C-148A	(C)	C-203A	(C)					S-67	(C)		
C-80A	(C)	C-155	(N)	C-212	(N)								
C-81	(N)	C-156	(C)	C-214	(N)								
C-82B	(P)	C-157	(N)	C-216A	(C)								
C-83	(C)	C-158	(C)	C-221A	(C)								
C-86A	(C)	C-159	(C)	C-222A	(C)								
C-87	(C)	C-160	(C)	C-223A	(C)								
C-88A	(C)	C-161	(N)	C-224A	(C)								
C-98A	(C)	C-162	(P)	C-225	(C)								
C-100A	(C)	C-163	(N)	C-228A	(C)								

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

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Table 5-7. HED Summary for Panel C-06

Checklist		Checklist (concluded)		Interview		Survey		Verification	
C-15A	(C)	C-137A	(C)	I-26	(C)	A-1A	(C)	T-1	(P)
C-16A	(C)	C-138	(N)	I-61	(N)	A-37	(P)	T-2	(P)
C-17	(C)	C-139A	(N)	I-62A	(C)	A-38A	(C)	T-19	(P)
C-23A	(N)	C-140	(C)			A-39	(C)	T-20A	(C)
C-24A	(C)	C-146A	(C)			A-40	(C)	T-28B	(N)
C-25A	(C)	C-147	(C)			A-41	(C)	T-30	(N)
C-74A	(C)	C-148A	(C)			A-42	(N)		
C-77A	(C)	C-154A	(C)			A-43	(C)		
C-80A	(C)	C-168A	(C)			A-45A	(N)		
C-81	(N)	C-170A	(C)			A-53	(C)		
C-83	(C)	C-176	(C)						
C-86A	(C)	C-183B	(C)			S-19	(P)		
C-88A	(C)	C-184A	(C)			S-20A	(P)		
C-92A	(C)	C-186A	(C)			S-52D	(C)		
C-94A	(C)	C-191A	(C)			S-52E	(P)		
C-94C	(C)	C-198A	(C)			S-55A	(C)		
C-95	(C)	C-201A	(C)			S-55B	(C)		
C-98A	(C)	C-203A	(C)			S-55C	(C)		
C-100A	(C)	C-206A	(C)			S-56	(C)		
C-101	(N)	C-208A	(C)			S-63	(P)		
C-103	(C)	C-211	(C)			S-68A	(P)		
C-105A	(C)	C-214	(N)			S-70A	(P)		
C-107A	(C)	C-216A	(C)						
C-108	(C)	C-220	(N)						
C-111A	(C)	C-222A	(C)						
C-133A	(C)	C-223A	(C)						
C-134A	(C)	C-224A	(C)						
C-135	(C)	C-228A	(C)						
C-137	(C)								

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3317X

Table 5-8. HED Summary for Panel C-07

Checklist	Checklist (continued)	Checklist (concluded)	Experience	Interview	Survey	Verification
C-15A (C)	C-105A (C)	C-174A (C)	E-06 (C)	I-15 (C)	A-1A (C)	T-6A (C)
C-16A (C)	C-106A (C)	C-179E (N)		I-34 (C)	A-17A (P)	T-7C (C)
C-23A (N)	C-107A (C)	C-181A (P)		I-36A (C)	A-18 (N)	T-12 (C)
C-25A (C)	C-108 (C)	C-184A (C)		I-36B (C)	A-21 (C)	T-13B (C)
C-29A (C)	C-109A (P)	C-185 (C)		I-36C (C)	A28B (N)	T-23A (N)
C-32A (C)	C-110A (C)	C-186A (C)		I-47 (C)	A-28C (C)	T-24 (P)
C-34A (C)	C-111A (C)	C-187 (N)		I-60A (P)	A-38A (C)	
C-35 (N)	C-112 (C)	C-189A (C)		I-74B (C)	A-43 (C)	
C-36 (C)	C-114A (C)	C-190A (C)		I-76 (N)	A-45A (N)	
C-38A (C)	C-115A (C)	C-191A (C)		I-77 (C)	A-51 (N)	
C-58A (C)	C-124A (C)	C-193 (C)		I-83 (P)	A-52 (C)	
C-60A (C)	C-130A (C)	C-195 (C)		I-87 (P)	A-53 (C)	
C-61 (N)	C-132 (C)	C-198A (C)				
C-62B (P)	C-133A (C)	C-199 (C)			S-6 (C)	
C-63 (C)	C-134A (C)	C-201A (C)			S-19 (P)	
C-77A (C)	C-136 (C)	C-202A (C)			S-20A (P)	
C-80A (C)	C-137 (C)	C-203A (C)			S-33 (C)	
C-81 (N)	C-137A (C)	C-204 (C)			S-50C (C)	
C-83 (C)	C-138 (N)	C-206A (C)			S-52A (N)	
C-88A (C)	C-139A (N)	C-210 (N)			S-52D (C)	
C-89 (C)	C-140 (C)	C-211 (C)			S-59 (N)	
C-92A (C)	C-147 (C)	C-212 (N)			S-67B (N)	
C-93 (C)	C-148A (C)	C-214 (N)			S-70A (P)	
C-94A (C)	C-154A (C)	C-216A (C)				
C-94C (C)	C-155 (N)	C-219 (C)				
C-95 (C)	C-156 (C)	C-220 (N)				
C-97 (C)	C-157 (N)	C-221A (C)				
C-98A (C)	C-158 (C)	C-222A (C)				
C-100A (C)	C-161 (N)	C-223A (C)				
C-101 (N)	C-163 (N)	C-224A (C)				
C-102D (N)	C-164 (C)	C-225 (C)				
C-103 (C)	C-168A (C)	C-228A (C)				
C-104 (C)	C-172 (C)					
C-104C (C)	C-173 (C)					

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3318X

Table 5-9. HED Summary for Panel C-08

Checklist	Checklist (concluded)	Experience	Interview	Survey	Verification
C-5 (C)	C-102D (N)	E-05 (C)	I-30 (P)	A-17A (P)	T-6A (C)
C-15A (C)	C-103 (C)	E-10 (C)	I-72A (N)	A-28A (N)	T-11C (N)
C-16A (C)	C-104 (C)		I-73 (C)	A-44 (N)	T-12 (C)
C-23A (N)	C-105A (C)			A-51 (N)	T-19 (P)
C-24A (C)	C-107A (C)			A-52 (C)	T-26 (N)
C-25A (C)	C-108 (C)			A-55 (C)	
C-29A (C)	C-110A (C)				
C-32A (C)	C-111A (C)			S-6 (C)	
C-34A (C)	C-114A (C)			S-19 (P)	
C-35 (N)	C-133A (C)			S-20A (P)	
C-36 (C)	C-134A (C)			S-43A (C)	
C-37 (C)	C-137A (C)			S-52A (N)	
C-38A (C)	C-138 (N)			S-66 (N)	
C-42 (C)	C-139A (N)				
C-43 (C)	C-140 (C)				
C-45 (N)	C-142 (C)				
C-47 (C)	C-146A (C)				
C-48 (N)	C-148A (C)				
C-53 (C)	C-168A (C)				
C-58A (C)	C-170A (C)				
C-66A (C)	C-171A (N)				
C-77A (C)	C-174A (C)				
C-78A (C)	C-178A (C)				
C-88A (C)	C-184A (C)				
C-94A (C)	C-186A (C)				
C-94B (C)	C-187 (N)				
C-95 (C)	C-189A (C)				
C-98A (C)	C-190A (C)				
C-100A (C)	C-191A (C)				
C-101 (N)	C-198A (C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3319X

Table 5-10. HED Summary for Panel C-02

Checklist	Experience	Interview	Survey	Verification
C-73A (P)	E-08 (C)	I-5A (N)	A-1A (C)	T-11F (N)
C-77A (C)		I-61 (N)	A-2 (N)	T-12 (C)
C-133A (C)		I-62B (C)	A-5 (N)	T-18 (C)
C-134A (C)		I-63 (N)	A-45A (N)	T-20A (C)
C-137A (C)		I-64 (C)		
C-138 (N)				
C-139A (N)				
C-140 (C)				
C-143 (C)				
C-148A (C)				
C-168A (C)				
C-176 (C)				
C-178A (C)				
C-181B (N)				
C-182A (N)				
C-184A (C)				
C-186A (C)				
C-189A (C)				
C-191A (C)				
C-201A (C)				
C-202A (C)				
C-203A (C)				
C-205 (C)				
C-206A (C)				
C-208A (C)				
C-209 (C)				
C-211 (C)				
C-212 (N)				
C-214 (N)				
C-215 (C)				
C-216A (C)				
C-217 (N)				
C-219 (C)				
C-220 (N)				
C-221A (C)				
C-223A (C)				
C-224A (C)				
C-225 (C)				
C-227 (C)				
C-228A (C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3382X

Table 5-11. HED Summary for Panel C-10

Checklist		Checklist (concluded)		Interview		Survey		Verification	
C-1A	(C)	C-122	(C)	I-5A	(N)	A-2	(N)	T-7D	(N)
C-3	(C)	C-123	(C)	I-61	(N)	A-8	(N)	T-18	(C)
C-5	(C)	C-133A	(C)	I-63	(N)	A-12	(C)	T-20A	(C)
C-8A	(C)	C-134A	(C)	I-64	(C)	A-19	(C)	T-23A	(N)
C-9	(C)	C-13	(C)					T-25A	(N)
C-11	(C)	C-137A	(C)						
C-12	(C)	C-138	(N)						
C-42	(C)	C-139A	(N)						
C-43	(C)	C-140	(C)						
C-47	(C)	C-145	(C)						
C-49	(N)	C-148A	(C)						
C-53	(C)	C-154A	(C)						
C-57B	(N)	C-166C	(N)						
C-58A	(C)	C-168A	(C)						
C-59	(C)	C-169	(C)						
C-67A	(C)	C-171A	(N)						
C-71	(C)	C-173	(C)						
C-72A	(C)	C-176	(C)						
C-74A	(C)	C-177A	(C)						
C-76A	(C)	C-178A	(C)						
C-77A	(C)	C-179C	(N)						
C-78A	(C)	C-181A	(P)						
C-79	(C)	C-181B	(N)						
C-86A	(C)	C-182C	(N)						
C-88A	(C)	C-183B	(C)						
C-91	(C)	C-184A	(C)						
C-92A	(C)	C-186A	(C)						
C-93	(C)	C-187	(N)						
C-117	(C)	C-189A	(C)						
C-118	(C)	C-191A	(C)						
C-120	(C)	C-198A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3320X

Table 5-12. HED Summary for Panel C-11

Checklist		Interview		Survey		Verification	
C-1A	(C)	I-5A	(N)	A-2	(N)	T-5A	(N)
C-3	(C)	I-63	(N)	A-9	(C)	T-12	(C)
C-5	(C)	I-64	(C)	A-12	(C)	T-25A	(N)
C-9	(C)						
C-10	(C)						
C-11	(C)						
C-12	(C)						
C-57	(C)						
C-57B	(N)						
C-58A	(C)						
C-66A	(C)						
C-67A	(C)						
C-69	(P)						
C-70A	(P)						
C-72A	(C)						
C-74A	(C)						
C-76B	(N)						
C-77A	(C)						
C-78A	(C)						
C-88A	(C)						
C-89	(C)						
C-92A	(C)						
C-93	(C)						
C-133A	(C)						
C-134A	(C)						
C-137A	(C)						
C-138	(N)						
C-139A	(N)						
C-140	(C)						
C-147	(C)						
C-148A	(C)						
C-154A	(C)						
C-168A	(C)						
C-171A	(N)						
C-176	(C)						
C-178A	(C)						
C-181A	(P)						
C-181B	(N)						
C-182C	(N)						
C-184A	(C)						
C-189A	(C)						
C-190A	(C)						
C-191A	(C)						
C-198A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3321X

Table 5-13. HED Summary for Panel C-13

Checklist		Checklist (concluded)		Survey	
C-29B	(P)	C-92B	(P)	A-2	(N)
C-32B	(P)	C-124B	(P)	A-6B	(P)
C-34B	(P)	C-128C	(P)	A-15	(N)
C-35	(N)	C-130B	(P)	A-17B	(P)
C-36	(C)	C-133B	(C)	A-45B	(P)
C-37	(C)	C-137	(C)	A-55	(C)
C-38B	(P)	C-137B	(P)		
C-57B	(N)	C-138	(N)	S-68B	(P)
C-60B	(P)	C-139B	(P)		
C-61	(N)	C-140	(C)		
C-62C	(P)	C-144B	(P)		
C-63	(C)	C-174B	(P)		
C-70B	(P)	C-179H	(P)		
C-73B	(P)	C-181A	(P)		
C-76C	(P)	C-184B	(P)		
C-77B	(P)	C-186B	(P)		
C-80B	(P)	C-187	(N)		
C-81	(N)	C-189B	(P)		
C-82C	(P)	C-202B	(P)		
C-83	(C)	C-203B	(P)		
C-88A	(C)	C-214	(N)		

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3322X

Table 5-14. HED Summary for Panel C-15

Checklist		Interview		Survey	
C-30	(C)	I-39	(C)	A-2	(N)
C-32A	(C)			A-3A	(N)
C-33A	(C)			A-4	(C)
C-37	(C)			A-17A	(P)
C-38A	(C)			A-52	(C)
C-39	(C)				
C-116	(C)				
C-118	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3323X

Table 5-15. HED Summary for Panel C-16

Survey		Verification	
A-2	(N)	T-20A	(C)
A-3A	(N)	T-22A	(N)
A-7	(C)		
A-11	(C)		
A-26B	(N)		

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3323X

Table 5-16. HED Summary for Panel C-17

Checklist		Interview		Survey	
C-30	(C)	I-39	(C)	A-2	(N)
C-32A	(C)			A-3A	(N)
C-33A	(C)			A-4	(C)
C-37	(C)			A-17A	(P)
C-38A	(C)			A-52	(C)
C-39	(C)			S-49	(P)
C-116	(C)				
C-118	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3325X

Table 5-17. HED Summary for Panel C-20

Checklist		Checklist (concluded)		Experience		Interview		Survey		Verification	
C-15A	(C)	C-147	(C)	E-07	(C)	I-32	(P)	A-1A	(C)	T-6A	(C)
C-16A	(C)	C-148A	(C)			I-85	(C)	A-2	(N)		
C-18A	(P)	C-149A	(C)					A-6F	(N)		
C-23A	(N)	C-154A	(C)					A-10	(C)		
C-24A	(C)	C-166B	(N)					A-14	(N)		
C-25A	(C)	C-168A	(C)					A-15	(N)		
C-65A	(C)	C-171A	(N)					A-45A	(N)		
C-77A	(C)	C-181B	(N)					A-50	(N)		
C-80A	(C)	C-184A	(C)					A-52	(C)		
C-81	(N)	C-186A	(C)					A-54A	(N)		
C-83	(C)	C-187	(N)								
C-85	(C)	C-188	(N)					S-7	(N)		
C-88A	(C)	C-191A	(C)					S-8	(N)		
C-101	(N)	C-201A	(C)					S-20A	(P)		
C-103	(C)	C-203A	(C)					S-47	(P)		
C-105A	(C)	C-204	(C)					S-52D	(C)		
C-111A	(C)	C-206A	(C)								
C-133A	(C)	C-210	(N)								
C-134A	(C)	C-211	(C)								
C-135	(C)	C-214	(N)								
C-136	(C)	C-216A	(C)								
C-137	(C)	C-220	(N)								
C-137A	(C)	C-221A	(C)								
C-138	(N)	C-222A	(C)								
C-139A	(N)	C-223A	(C)								
C-140	(C)	C-224A	(C)								
C-141C	(P)	C-228A	(C)								
C-145	(C)										

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3326X

Table 5-18. HED Summary for Panel C-21

Checklist		Interview		Survey		Verification	
C-57B	(N)	I-40	(C)	A-1A	(C)	T-5B	(C)
C-118	(C)			A-2	(N)	T-13A	(N)
C-168A	(C)			A-45A	(N)	T-22B	(N)
C-184A	(C)					T-25C	(N)
C-189A	(C)						
C-191A	(C)						
C-201A	(C)						
C-202A	(C)						
C-203A	(C)						
C-205	(C)						
C-206A	(C)						
C-211	(C)						
C-212	(N)						
C-214	(N)						
C-216A	(C)						
C-219	(C)						
C-220	(N)						
C-223A	(C)						
C-224A	(C)						
C-225	(C)						
C-226	(C)						
C-227	(C)						
C-228A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3327X

Table 5-19. HED Summary for Panel C-24A

Checklist	Checklist (concluded)	Survey	Verification
C-1C (C)	C-108 (C)	A-3B (N)	T-2 (P)
C-2 (P)	C-110A (C)	A-16 (N)	T-6A (C)
C-13A (C)	C-114A (C)	A-17A (P)	T-19 (P)
C-14B (C)	C-127 (N)	A-54A (N)	T-20A (C)
C-15B (C)	C-128A (C)		
C-16A (C)	C-133A (C)	S-20A (P)	
C-19 (P)	C-134A (C)		
C-20 (C)	C-137A (C)		
C-25A (C)	C-138 (N)		
C-60A (C)	C-139A (N)		
C-61 (N)	C-140 (C)		
C-63 (C)	C-146A (C)		
C-65A (C)	C-148A (C)		
C-75 (C)	C-149A (C)		
C-76A (C)	C-154A (C)		
C-77A (C)	C-167A (C)		
C-80A (C)	C-168A (C)		
C-81 (N)	C-170A (C)		
C-83 (C)	C-171A (N)		
C-88A (C)	C-175A (C)		
C-93 (C)	C-181A (P)		
C-97 (C)	C-182A (N)		
C-98A (C)	C-184A (C)		
C-100A (C)	C-186A (C)		
C-101 (N)	C-189A (C)		
C-103 (C)	C-191A (C)		
C-105A (C)	C-192A (C)		
C-107A (C)	C-198A (C)		

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3333X

Table 5-20. HED Summary for Panel C-24B

Checklist		Checklist (concluded)		Interview		Survey		Verification	
C-1C	(C)	C-107A	(C)	I-5C	(N)	A-3B	(N)	T-2	(P)
C-2	(P)	C-108	(C)			A-13	(N)	T-6A	(C)
C-13A	(C)	C-109A	(P)			A-14	(N)	T-12	(C)
C-14B	(C)	C-110A	(C)			A-16	(N)	T-19	(P)
C-15B	(C)	C-114A	(C)			A-17A	(P)	T-20A	(C)
C-16A	(C)	C-115A	(C)			A-49	(C)	T-24	(P)
C-18A	(P)	C-127	(N)			A-54A	(N)	T-25B	(N)
C-19	(P)	C-128A	(C)						
C-20	(C)	C-133A	(C)			S-20A	(P)		
C-25A	(C)	C-134A	(C)						
C-60A	(C)	C-137A	(C)						
C-61	(N)	C-138	(N)						
C-63	(C)	C-139A	(N)						
C-65A	(C)	C-140	(C)						
C-75	(C)	C-146A	(C)						
C-76A	(C)	C-148A	(C)						
C-77A	(C)	C-154A	(C)						
C-80A	(C)	C-168A	(C)						
C-81	(N)	C-170A	(C)						
C-83	(C)	C-171A	(N)						
C-88A	(C)	C-175A	(C)						
C-93	(C)	C-181A	(P)						
C-97	(C)	C-182A	(N)						
C-98A	(C)	C-184A	(C)						
C-100A	(C)	C-186A	(C)						
C-101	(N)	C-189A	(C)						
C-103	(C)	C-191A	(C)						
C-105A	(C)	C-192A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3334X

Table 5-21. HED Summary for Panel C-25

Checklist		Interview		Survey		Verification	
C-1B	(P)	I-11	(P)	A-1A	(C)	T-4D	(N)
C-2	(P)			A-3C	(N)	T-11E	(P)
C-8A	(C)			A-13	(N)	T-19	(P)
C-77A	(C)			A-14	(N)		
C-78A	(C)			A-45A	(N)		
C-80A	(C)			A-54A	(N)		
C-81	(N)						
C-82B	(P)			S-7	(N)		
C-83	(C)			S-8	(N)		
C-84	(C)						
C-86A	(C)						
C-88A	(C)						
C-92A	(C)						
C-133A	(C)						
C-134A	(C)						
C-137A	(C)						
C-138	(N)						
C-139A	(N)						
C-140	(C)						
C-141A	(C)						
C-148A	(C)						
C-168A	(C)						
C-170A	(C)						
C-177A	(C)						
C-181B	(N)						
C-184A	(C)						
C-186A	(C)						
C-187	(N)						
C-189A	(C)						
C-191A	(C)						
C-198A	(C)						
C-201A	(C)						
C-203A	(C)						
C-206A	(C)						
C-211	(C)						
C-214	(N)						
C-216A	(C)						
C-218	(C)						
C-219	(C)						
C-220	(N)						
C-221A	(C)						
C-223A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3328X

Table 5-22. HED Summary for Panel C-26

Checklist		Interview		Survey	
C-58A	(C)	I-20	(N)	A-45A	(N)
C-60A	(C)	I-21	(C)	A-54A	(N)
C-61	(N)			A-55	(C)
C-63	(C)				
C-67A	(C)			S-8	(N)
C-72A	(C)				
C-77A	(C)				
C-80A	(C)				
C-81	(N)				
C-83	(C)				
C-86A	(C)				
C-88A	(C)				
C-98A	(C)				
C-100A	(C)				
C-101	(N)				
C-102E	(P)				
C-103	(C)				
C-104	(C)				
C-105A	(C)				
C-107A	(C)				
C-114A	(C)				
C-168A	(C)				
C-170A	(C)				
C-171A	(N)				
C-176	(C)				
C-181A	(P)				
C-184A	(C)				
C-186A	(C)				
C-191A	(C)				
C-198A	(C)				
C-201A	(C)				
C-213	(N)				
C-214	(N)				
C-216A	(C)				
C-221A	(C)				
C-222A	(C)				
C-223A	(C)				
C-224A	(C)				
C-228A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3329X

Table 5-23. HED Summary for Panel C-31

Checklist		Interview		Survey	
C-58A	(C)	I-68B	(C)	A-1A	(C)
C-60A	(C)			A-6D	(C)
C-61	(N)			A-6E	(N)
C-62A	(C)			A-15	(N)
C-63	(C)			A-45A	(N)
C-77A	(C)			A-54A	(N)
C-80A	(C)				
C-81	(N)				
C-82A	(C)				
C-83	(C)				
C-84	(C)				
C-87	(C)				
C-96A	(C)				
C-98A	(C)				
C-106A	(C)				
C-107A	(C)				
C-108	(C)				
C-133A	(C)				
C-137A	(C)				
C-138	(N)				
C-139A	(N)				
C-140	(C)				
C-201A	(C)				
C-203A	(C)				
C-206A	(C)				
C-207	(C)				
C-214	(N)				
C-216A	(C)				
C-219	(C)				
C-220	(N)				
C-222A	(C)				
C-223A	(C)				
C-224A	(C)				
C-228A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3330X

Table 5-24. HED Summary for Panel C-36

Checklist	Survey
C-92A (C)	A-13 (N)
C-134A (C)	A-14 (N)
C-137A (C)	A-52 (C)
C-138 (N)	
C-140 (C)	
C-146A (C)	
C-148A (C)	
C-154A (C)	
C-171A (N)	
C-179B (C)	
C-180 (N)	
C-181A (P)	
C-184A (C)	
C-186A (C)	
C-189A (C)	

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3331X

Table 5-25. HED Summary for Panel C-37

Checklist	Interview	Survey	Verification
C-91 (C)	I-100 (C)	A-2 (N)	T-12 (C)
C-92A (C)		A-14 (N)	T-27 (N)
C-133A (C)		A-27 (C)	
C-134A (C)			
C-137A (C)		S-53 (N)	
C-138 (N)			
C-139A (N)			
C-140 (C)			
C-144A (C)			
C-148A (C)			
C-154A (C)			
C-168A (C)			
C-174A (C)			
C-179C (N)			
C-181A (P)			
C-184A (C)			
C-186A (C)			
C-187 (N)			
C-189A (C)			
C-190A (C)			
C-191A (C)			
C-196 (C)			

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3332X

Table 5-26. HED Summary for Panel C-257

Checklist		Interview		Survey		Verification	
C-37	(C)	I-31	(N)	A-1A	(C)	T-7D	(N)
C-77A	(C)			A-17A	(P)	T-13A	(N)
C-86A	(C)			A-45A	(N)		
C-88A	(C)			A-54A	(N)		
C-124A	(C)						
C-128A	(C)			S-8	(N)		
C-130A	(C)						
C-133A	(C)						
C-134A	(C)						
C-137	(C)						
C-138	(N)						
C-139A	(N)						
C-140	(C)						
C-148A	(C)						
C-149A	(C)						
C-154A	(C)						
C-168A	(C)						
C-184A	(C)						
C-186A	(C)						
C-189A	(C)						
C-191A	(C)						
C-192A	(C)						
C-201A	(C)						
C-203A	(C)						
C-212	(N)						
C-214	(N)						
C-223A	(C)						
C-224A	(C)						
C-228A	(C)						

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3335X

Table 5-27. HED Summary for Panel C-258

Checklist	Interview	Survey	Verification
C-37 (C)	I-31 (N)	A-1A (C)	T-7D (N)
C-77A (C)		A-17A (P)	T-13A (N)
C-86A (C)		A-45A (N)	
C-88A (C)		A-54A (N)	
C-124A (C)			
C-128A (C)		S-8 (N)	
C-130A (C)			
C-133A (C)			
C-134A (C)			
C-137 (C)			
C-138 (N)			
C-139A (N)			
C-140 (C)			
C-148A (C)			
C-149A (C)			
C-150 (C)			
C-154A (C)			
C-168A (C)			
C-184A (C)			
C-186A (C)			
C-189A (C)			
C-191A (C)			
C-192A (C)			
C-194A (C)			
C-201A (C)			
C-203A (C)			
C-212 (N)			
C-214 (N)			
C-223A (C)			
C-224A (C)			
C-228A (C)			

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3336X

Table 5-28. HED Summary for Panel C-259

Checklist		Interview		Survey	
C-3	(C)	I-31	(N)	A-1A	(C)
C-4	(N)			A-45A	(N)
C-8A	(C)			A-54A	(N)
C-42	(C)				
C-43	(C)			S-8	(N)
C-47	(C)			S-20A	(P)
C-50	(N)				
C-51	(P)				
C-53	(C)				
C-58A	(C)				
C-65A	(C)				
C-67A	(C)				
C-77A	(C)				
C-80A	(C)				
C-81	(N)				
C-83	(C)				
C-86A	(C)				
C-87	(C)				
C-92A	(C)				
C-133A	(C)				
C-137	(C)				
C-138	(N)				
C-139A	(N)				
C-140	(C)				
C-141B	(N)				
C-179F	(N)				
C-181B	(N)				
C-184A	(C)				
C-189A	(C)				
C-201A	(C)				
C-203A	(C)				
C-211	(C)				
C-212	(N)				
C-214	(N)				
C-221A	(C)				
C-223A	(C)				
C-228A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3337X

Table 5-29. HED Summary for Panel C-260

Checklist		Interview		Survey	
C-3	(C)	I-31	(N)	A-1A	(C)
C-4	(N)			A-45A	(N)
C-8A	(C)			A-54A	(N)
C-42	(C)				
C-43	(C)			S-8	(N)
C-47	(C)				
C-50	(N)				
C-51	(P)				
C-53	(C)				
C-58A	(C)				
C-67A	(C)				
C-80A	(C)				
C-81	(N)				
C-83	(C)				
C-86A	(C)				
C-87	(C)				
C-92A	(C)				
C-133A	(C)				
C-137	(C)				
C-138	(N)				
C-139A	(N)				
C-140	(C)				
C-141B	(N)				
C-179F	(N)				
C-181B	(N)				
C-184A	(C)				
C-189A	(C)				
C-201A	(C)				
C-203A	(C)				
C-211	(C)				
C-212	(N)				
C-214	(N)				
C-221A	(C)				
C-223A	(C)				
C-224A	(C)				
C-225	(C)				
C-228A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3338X

Table 5-30. HED Summary for Panel C-252A

Checklist		Checklist (continued)		Interview		Survey		Verification	
C-8B	(P)	C-137	(C)	I-2	(P)	A-1B	(P)	T-6B	(P)
C-13B	(P)	C-137C	(P)	I-60B	(P)	A-6C	(P)		
C-16B	(P)	C-138	(N)	I-75	(P)	A-14	(N)		
C-23B	(P)	C-139C	(P)			A-17C	(P)		
C-24B	(P)	C-140	(C)			A-26A	(N)		
C-25B	(P)	C-146B	(P)			A-45C	(P)		
C-28B	(P)	C-168B	(P)			A-54B	(P)		
C-29C	(P)	C-171B	(P)						
C-32C	(P)	C-184C	(P)			S-2	(P)		
C-38C	(P)	C-186C	(P)			S-43B	(P)		
C-58B	(P)	C-190B	(P)			S-53	(N)		
C-60C	(P)	C-191B	(P)						
C-61	(N)	C-198B	(P)						
C-62D	(P)	C-201B	(P)						
C-63	(C)	C-202C	(P)						
C-96B	(P)	C-203C	(P)						
C-98B	(P)	C-206B	(P)						
C-100B	(C)	C-208B	(P)						
C-101	(N)	C-211	(C)						
C-102B	(P)	C-212	(N)						
C-103	(C)	C-214	(N)						
C-105B	(P)	C-221B	(P)						
C-106B	(P)	C-222B	(P)						
C-107B	(C)	C-223B	(P)						
C-114B	(P)	C-224B	(P)						
C-133C	(C)	C-228B	(P)						
C-134B	(P)								

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3339X

Table 5-31. HED Summary for Panel C-252B

Checklist	Checklist	Interview	Survey	Verification
C-16B (P)	C-134B (P)	I-5B (P)	A-1B (P)	T-6B (P)
C-18B (P)	C-137 (C)		A-6C (P)	T-7E (P)
C-23B (P)	C-137C (P)		A-14 (N)	T-20B (P)
C-24B (P)	C-138 (N)		A-17C (P)	
C-25B (P)	C-140 (C)		A-38B (P)	
C-28B (P)	C-148B (P)		A-45C (P)	
C-29C (P)	C-149B (P)		A-54B (P)	
C-32C (P)	C-154B (P)		A-55 (C)	
C-33B (P)	C-168B (P)			
C-34C (P)	C-170B (P)		S-20B (P)	
C-35 (N)	C-171B (P)		S-70B (P)	
C-36 (C)	C-184C (P)			
C-38C (P)	C-186C (P)			
C-58B (P)	C-190B (P)			
C-65B (P)	C-191B (P)			
C-67B (P)	C-198B (P)			
C-94D (P)	C-201B (P)			
C-97 (C)	C-202C (P)			
C-98B (P)	C-203C (P)			
C-100B (C)	C-212 (N)			
C-101 (N)	C-214 (N)			
C-102B (P)	C-216B (P)			
C-103 (C)	C-221B (P)			
C-105B (P)	C-222B (P)			
C-107B (C)	C-223B (P)			
C-110B (P)	C-224B (P)			
C-111B (P)	C-228B (P)			

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3340X

Table 5-32. HED Summary for Panel C-252C

Checklist		Checklist (continued)		Survey		Verification	
C-16B	(P)	C-114B	(P)	A-1B	(P)	T-6B	(P)
C-18B	(P)	C-115B	(P)	A-6C	(P)	T-7E	(P)
C-23B	(P)	C-134B	(P)	A-14	(N)	T-20B	(P)
C-24B	(P)	C-137	(C)	A-17C	(P)		
C-25B	(P)	C-137C	(P)	A-38B	(P)		
C-28B	(P)	C-138	(N)	A-45C	(P)		
C-29C	(P)	C-140	(C)	A-54B	(P)		
C-32C	(P)	C-148B	(P)	A-55	(C)		
C-33B	(P)	C-149B	(P)				
C-34C	(P)	C-154B	(P)	S-20B	(P)		
C-35	(N)	C-168B	(P)	S-70B	(P)		
C-36	(C)	C-171B	(P)				
C-38C	(P)	C-177B	(P)				
C-58B	(P)	C-178B	(P)				
C-65B	(P)	C-184C	(P)				
C-67B	(P)	C-186C	(P)				
C-94D	(P)	C-190B	(P)				
C-97	(C)	C-191B	(P)				
C-98B	(P)	C-198B	(P)				
C-100B	(C)	C-201B	(P)				
C-101	(N)	C-202C	(P)				
C-102B	(P)	C-203C	(P)				
C-103	(C)	C-212	(N)				
C-105B	(P)	C-214	(N)				
C-107B	(C)	C-216B	(P)				
C-109B	(P)	C-222B	(P)				
C-110B	(P)	C-223B	(P)				
C-111B	(P)	C-224B	(P)				
C-113B	(P)	C-228B	(P)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3341X

Table 5-33. HED Summary for Panel C-252D

Checklist		Checklist		Survey	
C-16B	(P)	C-133C	(C)	A-6C	(P)
C-22	(N)	C-134B	(P)	A-14	(N)
C-25B	(P)	C-138	(N)	A-15	(N)
C-57B	(N)	C-139C	(P)	A-45C	(P)
C-58B	(P)	C-140	(C)	A-46	(P)
C-65B	(P)	C-148B	(P)	A-47	(P)
C-66B	(P)	C-167B	(P)	A-48	(P)
C-68	(P)	C-168B	(P)	A-53	(C)
C-72B	(P)	C-171B	(P)	A-54B	(P)
C-73C	(P)	C-175B	(P)	A-55	(C)
C-74B	(P)	C-179G	(P)	A-56	(P)
C-76D	(P)	C-181C	(P)		
C-77C	(P)	C-182E	(P)	S-50D	(P)
C-78B	(C)	C-184C	(P)		
C-80C	(P)	C-186C	(P)		
C-81	(N)	C-189C	(P)		
C-82D	(P)	C-190B	(P)		
C-83	(C)	C-191B	(P)		
C-86B	(P)	C-192B	(P)		
C-88B	(P)	C-194B	(P)		
C-94D	(P)	C-198B	(P)		
C-98B	(P)	C-211	(C)		
C-99	(P)	C-214	(N)		
C-100B	(C)	C-216B	(P)		
C-101	(N)	C-219	(C)		
C-103	(C)	C-220	(N)		
C-105B	(P)	C-221B	(P)		
C-107B	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3342X

Table 5-34. HED Summary for Panel C-263A

Checklist		Interview		Survey	
C-96A	(C)	I-56	(P)	A-13	(N)
C-98A	(C)	I-80	(C)	A-52	(C)
C-100A	(C)				
C-101	(N)				
C-103	(C)				
C-105A	(C)				
C-107A	(C)				
C-111A	(C)				
C-113A	(C)				
C-133A	(C)				
C-134A	(C)				
C-137	(C)				
C-137A	(C)				
C-138	(N)				
C-139A	(N)				
C-140	(C)				
C-142	(C)				
C-148A	(C)				
C-149A	(C)				
C-154A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3343X

Table 5-35. HED Summary for Panel C-264B

Checklist		Interview		Survey	
C-96A	(C)	I-56	(P)	A-13	(N)
C-98A	(C)	I-80	(C)	A-52	(C)
C-100A	(C)				
C-101	(N)				
C-103	(C)				
C-105A	(C)				
C-107A	(C)				
C-111A	(C)				
C-113A	(C)				
C-133A	(C)				
C-134A	(C)				
C-137	(C)				
C-137A	(C)				
C-138	(N)				
C-139A	(N)				
C-140	(C)				
C-142	(C)				
C-143	(C)				
C-148A	(C)				
C-149A	(C)				
C-152	(C)				
C-154A	(C)				

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3344X

Table 5-36. HED Summary for Panel C-223D

Verification
T-11A (N)

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3345X

Table 5-37. HED Summary for Panel C-291A and 291B

Survey
A-13 (N)

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3347X

Table 5-38. HED Summary for Panel C-292 (Auxiliary Shutdown Panel)

Checklist		Checklist (concluded)	
R-1	(N)	R-21	(N)
R-2	(N)	R-22	(N)
R-3	(P)	R-23	(C)
R-4	(N)	R-24	(C)
R-5	(C)	R-25	(P)
R-6	(P)	R-26	(C)
R-7	(N)	R-27	(C)
R-8	(P)	R-28	(C)
R-9	(C)	R-31	(C)
R-10	(C)	R-32	(N)
R-11	(C)	R-33	(P)
R-12	(P)	R-34	(C)
R-13	(P)	R-35	(N)
R-14	(P)	R-36	(N)
R-15	(P)	R-37	(C)
R-16	(N)	R-38	(N)
R-17	(P)	R-39	(C)
R-18	(N)	R-40	(C)
R-19	(N)	R-41	(C)
R-20	(N)	R-42	(C)

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

60526-3340X

- Poor illumination exists under normal control room conditions on panel C20.

- Some low level alarms are set at a limit that does not allow the operator enough time to correct the problem.

- Some annunciator window tiles are not located over the panels most closely related to their function.

- The control room should be arranged for efficient, unobstructed movement and communication--with respect to radiation and temperature monitoring panels, offgas storage, standby gas treatment.

The list of general HEDs that involve problems in conditions that similarly affect any work station or operating sequence is shown in Table 5-39.

Proper justification for all HEDs that are not corrected is found in Appendixes D through F.

5.3.3 Comparison of Potential with Existing Discrepancies

The result of the human engineering review of the proposed panel redesigns was a set of potential discrepancies affecting the instrumentation and layout of the new panel designs. These potential discrepancies are described fully in the report addressing evaluation of proposed panel redesigns. The set of discrepancies generated by the redesign does not necessarily identify new potential HEDs until a comparison is made with the set of existing HEDs. Such a comparison was made to determine whether the discrepancies have already been documented as HEDs. The comparison showed that the discrepancies generated by the redesign fall into one of three groups:

1. Existing HEDs already documented--These discrepancies are HEDs already identified during the DCRDR.

2. New potential HEDs--The discrepancies in this category would be new HEDs created by redesign of the control room.

3. Existing HEDs not previously documented--This set of discrepancies pertains to the existing design, but they were not identified during the DCRDR.

Existing HEDs Already Documented--In some cases, the potential HEDs identified during the review of the mock-up and convention specification had already been identified as HEDs during the control room survey, the operating experience review, or the verification DCRDR activities.

For the mock-up review, HEDs for DCRDR label enhancements and the control panel layout issues listed in Table 5-1 had already been documented. Resolutions to these problems are listed in Appendixes D and E. The

Table 5-39. Summary of Disposition of General HEDs

Experience	Interview	Interview	Survey	Verification
E-02 (C)	I-1 (C)	I-67 (C)	A-20 (C)	T-10 (P)
E-03 (C)	I-3 (C)	I-69 (N)	A-22 (P)	
E-04 (C)	I-6 (C)	I-70 (N)	A-23 (N)	
E-09 (C)	I-7 (P)	I-79 (N)	A-24 (P)	
	I-8 (P)	I-81 (C)	A-25 (N)	
	I-9 (P)	I-82 (C)		
	I-10 (P)	I-84 (P)	S-1 (C)	
	I-12 (N)	I-86 (C)	S-3 (C)	
	I-13 (C)	I-88 (P)	S-4 (N)	
	I-18 (N)	I-89 (N)	S-5 (N)	
	I-23 (N)	I-90 (P)	S-9 (P)	
	I-28 (C)	I-91 (P)	S-10 (C)	
	I-29 (C)	I-94 (C)	S-11 (C)	
	I-41 (C)	I-95 (C)	S-12 (C)	
	I-42 (P)	I-96 (C)	S-13 (N)	
	I-43 (C)	I-97 (N)	S-14 (C)	
	I-44 (C)	I-98 (N)	S-15 (C)	
	I-45 (N)	I-99 (C)	S-16 (P)	
	I-46 (N)	I-101 (N)	S-17 (P)	
	I-49 (N)	I-102 (P)	S-21 (P)	
	I-50 (N)	I-103 (N)	S-22 (P)	
	I-51 (N)		S-23 (P)	
	I-52 (C)		S-24 (P)	
	I-53 (C)		S-25 (P)	
	I-55 (N)		S-26 (P)	
	I-65 (P)		S-27 (P)	
	I-66 (C)		S-28 (C)	
			S-29 (N)	
			S-30 (C)	
			S-31 (N)	
			S-32 (P)	
			S-34 (P)	
			S-35 (P)	
			S-36 (P)	
			S-37 (P)	
			S-38 (P)	
			S-40 (P)	
			S-41 (P)	
			S-42 (P)	
			S-44 (P)	
			S-45 (P)	
			S-46 (C)	
			S-48 (P)	
			S-57 (C)	
			S-61 (C)	

Key: (C) = Corrected
(P) = Pending
(N) = Uncorrected

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convention specification document will resolve all of the labelling problems identified during the mock-up review.

The resolutions to the discrepancies between NUREG-0700 guidelines and the convention specifications will be implemented in the next revision to the convention specification document. These revisions will include additional specifications for text fonts for labels and color codes to resolve these problems.

New Potential HEDs--The discrepancies from human engineering guidelines that would be created from the redesign are documented as new potential HEDs. They are problem areas that would be identified as HEDs if the proposed panel redesign was in place in the control room. These new problems involve the application of demarcation and mimic lines. Revised designs will be prepared to resolve these discrepancies.

Existing Discrepancies Not Previously Documented--The discrepancies in this category pertain to the existing design but were not identified during the control room design review. They were not documented previously, assessed for human performance, safety, or operation consequences, or categorized by priority level.

This set of HEDs was added to the data base between June and December 1986. The individual components were added to existing HEDs when the HED had already been documented, or a new HED was prepared to document the discrepancy. The complete assessment process described in Section 4 was applied to the new HEDs to determine their significance. Resolutions were determined in the same manner as for the remainder of the HEDs. Those resolutions are also described in Appendixes D and E. A separate listing of these HEDs is available at the Monticello site.

5.3.4 Overall Conclusions

The following conclusions regarding the proposed control room modifications are warranted based on the human engineering review:

- The design modifications effectively correct a significant number of inadequate or unsuitable design features. (Resolutions for the remaining HEDs not corrected by the proposed redesigns are described in Appendixes D and E.)

- A number of new discrepancies would be generated, according to the guidelines expressed in NUREG-0700.

- The panel layout conforms much more closely to approved conventions for flow path and control/display interrelationship as stated in the Monticello Human Engineering Design Requirements and Conventions Specification.

- Operator involvement in the redesign process and approval of the results helps assure high operator acceptance of the new designs.

- Possible negative effects of the redesign on the operating staff in lengthened reaction time to locating correct instruments should be very short term in duration and mitigated by training to be conducted in the Monticello simulator.

- There is a high likelihood of long-term improvements in operator performance and reduction of errors under both normal and emergency operating procedures.

SECTION 6
IMPLEMENTATION PHASE

The primary product of the review and assessment phases of the control room design review described in Sections 2 through 5 is a set of proposed control room modifications designed to resolve human engineering discrepancies. Northern States Power Company recognizes the need to integrate the results of the DCRDR with other requirements, such as refueling outage schedules, maintenance plans, and other scheduled plant upgrades (for example, a new plant process computer system and SPDS). To integrate the requirements in an effective and cost-efficient manner, Monticello has designed a coordinated program for plant improvements. This integrated program will be a management tool for use by Northern States Power Company to allocate human and financial resources effectively.

This section describes the coordinated program for plant improvements, correction implementation categories that have been identified to support the program, and correction schedule milestones.

6.1 CONTROL ROOM DESIGN IMPROVEMENT PLAN

6.1.1 Work Completed

Substantial progress has already been made in the implementation of control room improvements. The following work has been completed or is scheduled for completion in 1986:

- New operator work station:
  - Add operator work space,
  - Include shift site superintendent work space,
  - Incorporate SPDS CRTs into operator's desk,
  - Add storage space,
  - Provide print lay down space;
- New operator chairs:
  - With automatic height adjustment,
  - Anthropometrically designed for comfort,
  - With carpet rollers,
  - Cloth covered;
- Control room carpeting:
  - To reduce background noise,
  - To reduce glare from the floor,
  - To improve control room aesthetics;

- Control room communications:

  - Add multiline phones,
  - Add telephone head sets for refueling activities;

- C-04 panels:

  - Obtained management approval to modify C-04 panels in 1987.

Conceptual designs for the main control panels and most back panels have been developed and implemented on the control board full-scale mock-up. As described in Section 5, these conceptual designs have been evaluated and approved by the Control Room Design Review Committee. Budget estimates have been developed and presented to the corporate budget management committee.

Formal budget preparation for capital improvements occurring after 1987 is continuing. Plans for miscellaneous improvements include:

- Improve control room ventilation, add diffusers:

  - To reduce noise,
  - To reduce drafts;

- Install accoustical ceiling tile:

  - To reduce noise,
  - To improve aesthetics;

- Install wide-spectrum fluorescent light bulbs:

  - To improve control room lighting,
  - To ease strain on operator's eyes;

- Install parabolic louvers in control room light fixtures:

  - To reduce instrument glare,
  - To relieve strain on operator's eyes.

6.1.1.1 Operator Work Station--A new operator work station and its associated work areas in the simulator and the control room are evidence of the approach that Monticello plans to use for other panel modifications. This change was based on identifying problems with the original equipment; a modification plan was designed to remedy these problems and add needed functions. These plans were used to guide construction of a full-scale mock-up that was reviewed extensively by the Control Room Design Review Committee and the operators. Because of this review, a number of modifications were added to the design.

The installation of the new work station was completed during the outage in the spring of 1986. Review of the work station continues. Plans call for a modification to the geometry of the working surface on the main work station to better match the original design concept.

Figures 6-1 through 6-5 show scenes of the control room before the installation of the new work station, and Figures 6-6 through 6-9 show the key features of the new work station.

6.1.1.2 Component Modifications--Several component modifications have been made during the course of the review, based on ongoing plant requirements for modification. These modifications were reviewed and approved by the Control Room Design Review Committee. These modified components were reexamined at the end of the review cycle to complete the survey of control room components.

6.1.2 Review of Implemented Modifications

Section 4 describes the selection process for panel redesign, and Section 5 discusses how the human engineering review and assessment of safety consequences associated with the proposed redesign were accomplished. As redesign plans become further defined, additional review procedures will be implemented as necessary. However, review of modifications will focus on full-scale mock-up rather than on installed modifications to control room panels.

6.1.3 Continuing Human Engineering Review

Northern States Power Company has committed to providing the capability for continued human engineering assessment during the course of the correction implementation phase. The commitment is demonstrated in four ways:

- The Monticello Human Engineering Design Requirements and Conventions Specification is being adopted as a guide for all subsequent control room changes to standardize the operator interface against proven guidelines.

- The Control Room Design Review Committee will continue to be involved in overseeing the implementation effort and providing any further human engineering support.

- Northern States Power Company has requested additional human factors support from Honeywell throughout 1987.

- NSP administrative controls for nuclear plant modification requires human factors engineering review of all control room modifications.

6.2 CORRECTION SCHEDULE

6.2.1 Correction Implementation Plans

Monticello has assessed the impact of the Detailed Control Room Design Review. The underlying result will require substantial expenditures of personnel time, engineering talents, operator and plant personnel training, and plant improvement costs over a period of several years.

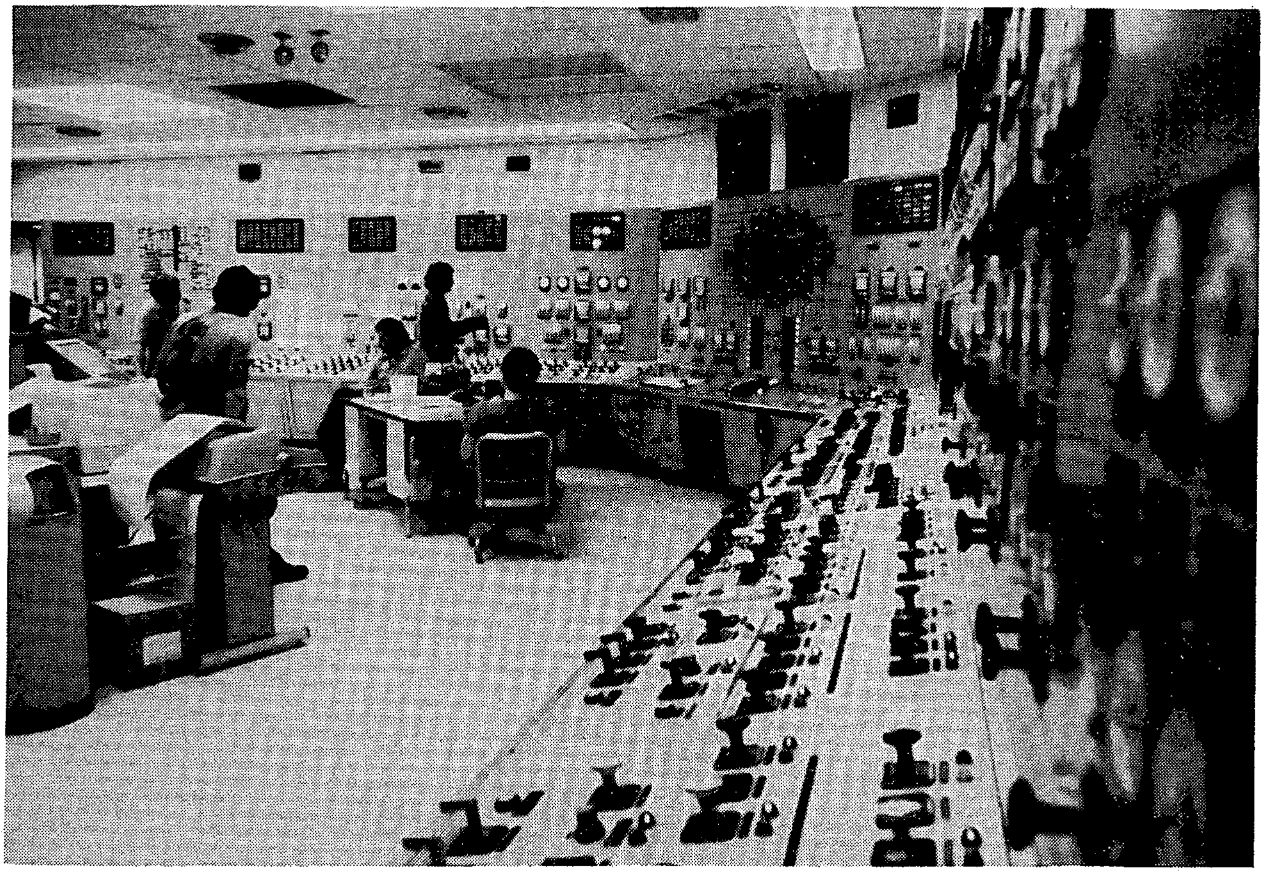

Figure 6-1. Control Room View Prior to April 1986: Generation Components (Foreground); Nuclear and Emergency Core Cooling System Components (Background)

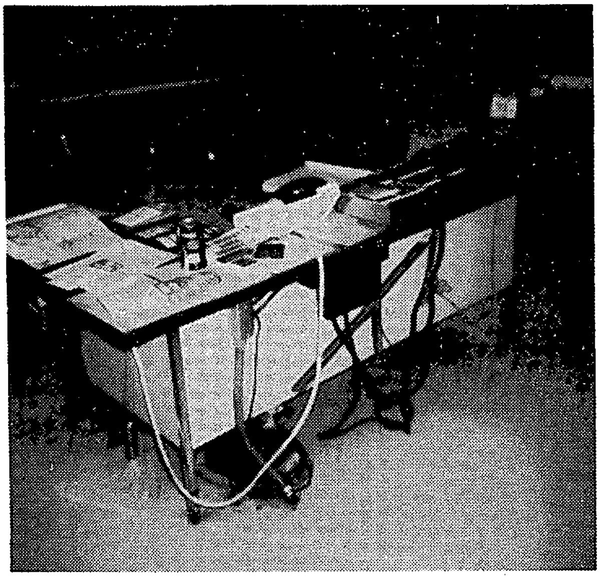

Figure 2. Control Room View Prior to April 1986: Operator Work Station Area

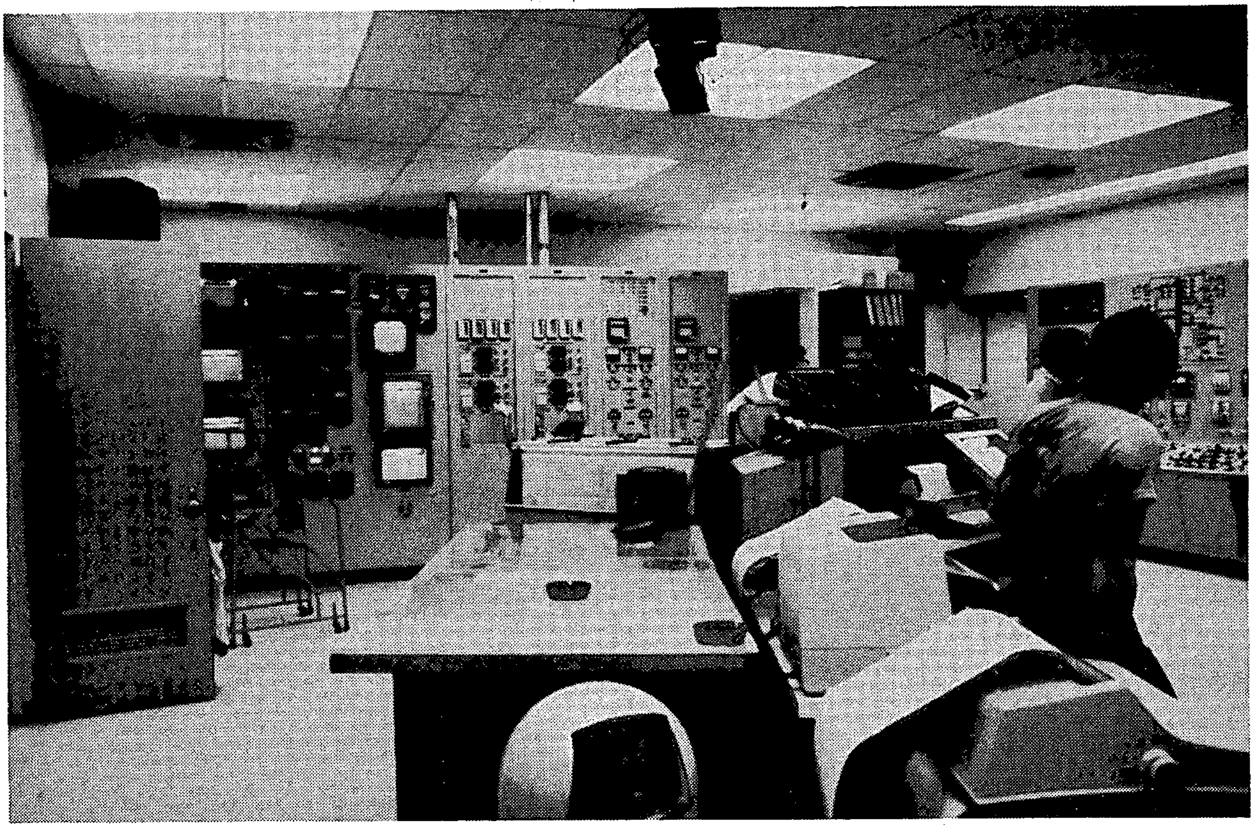

Figure 6-3. Control Room View Prior to April 1986: Overview of Plant Process Computer Work Area

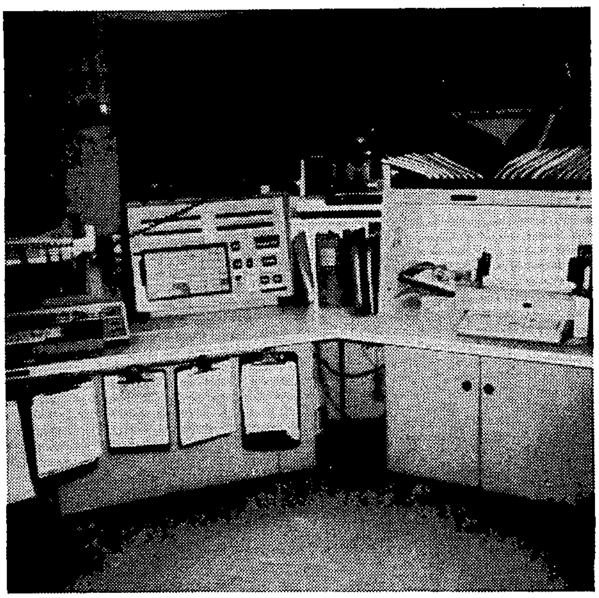

Figure 6-4. Control Room View Prior to April 1986: Left Front of Plant Process Computer Work Area

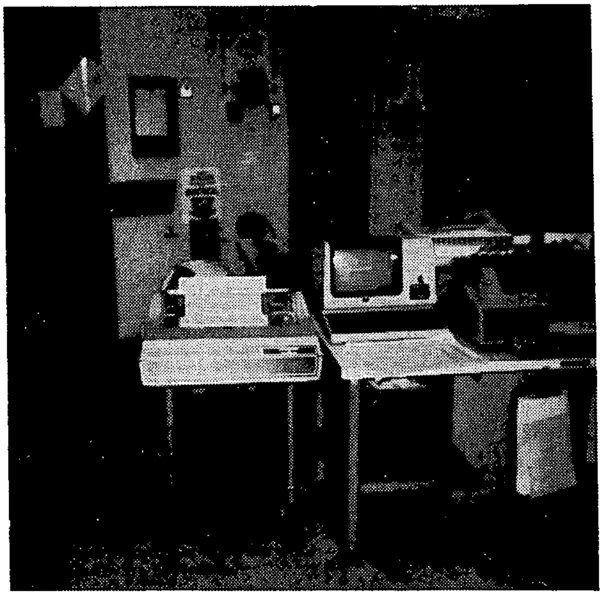

Figure 6-5. Control Room View Prior to April 1986: Right Front of Plant Process Computer Work Area

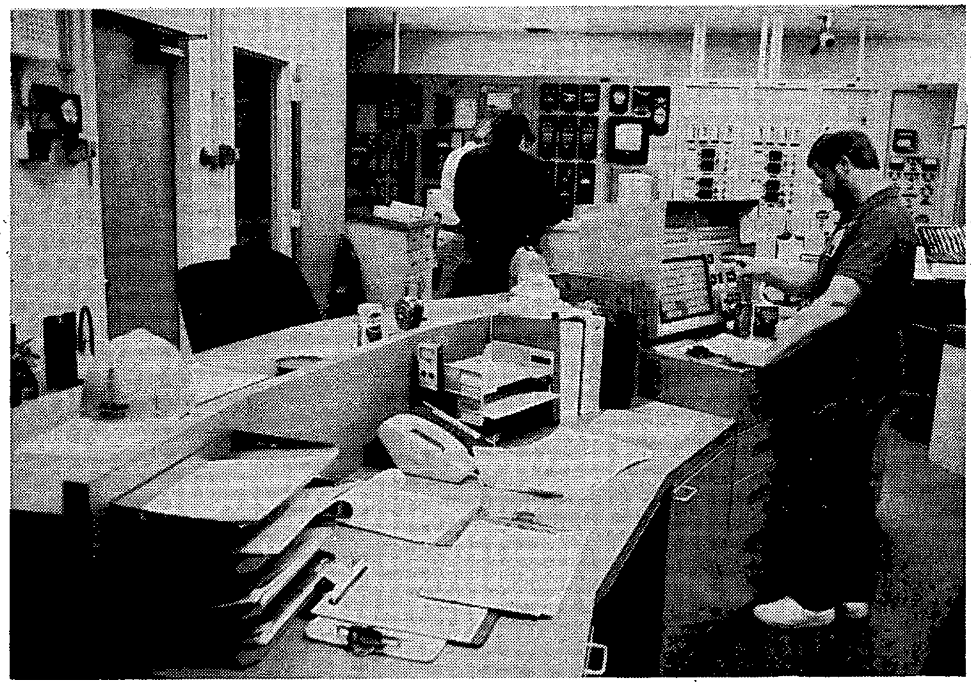

Figure 6-6. Current Control Room View: Front of Plant Process Computer Work Area

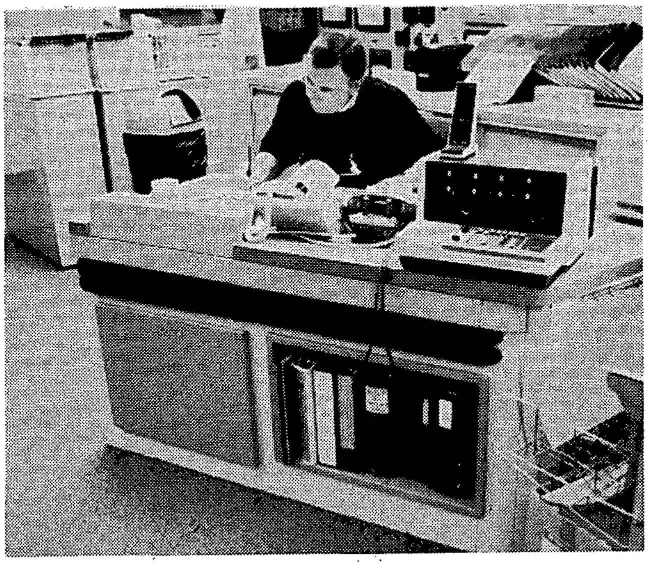

Figure 6-7. Current Control Room View: Shift Supervisor's Work Station

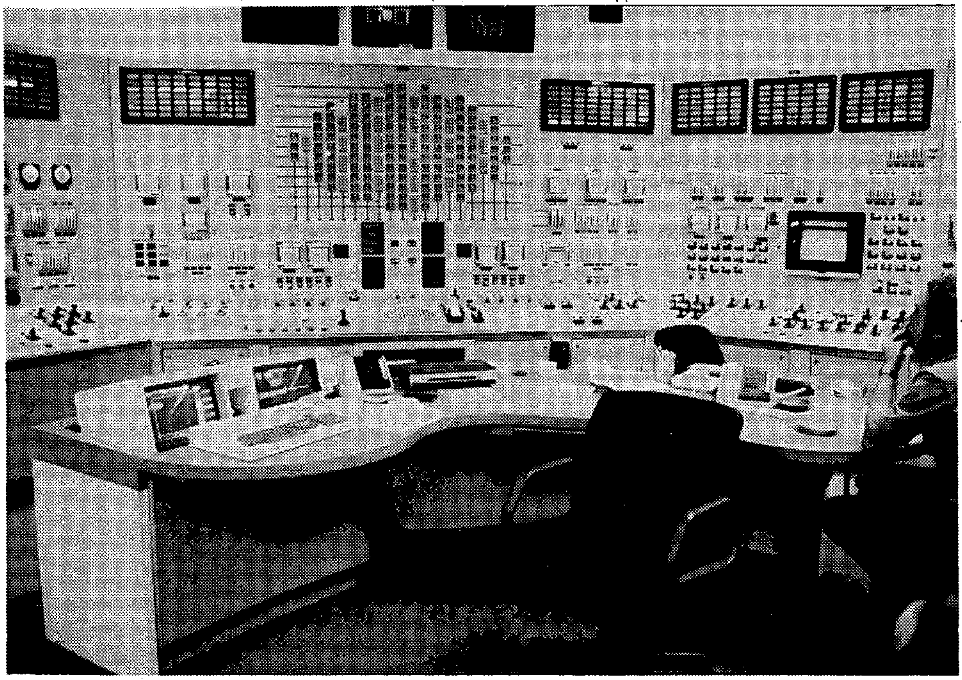

Figure 6-8. Current Control Room View: Closeup of Operator's Work Station

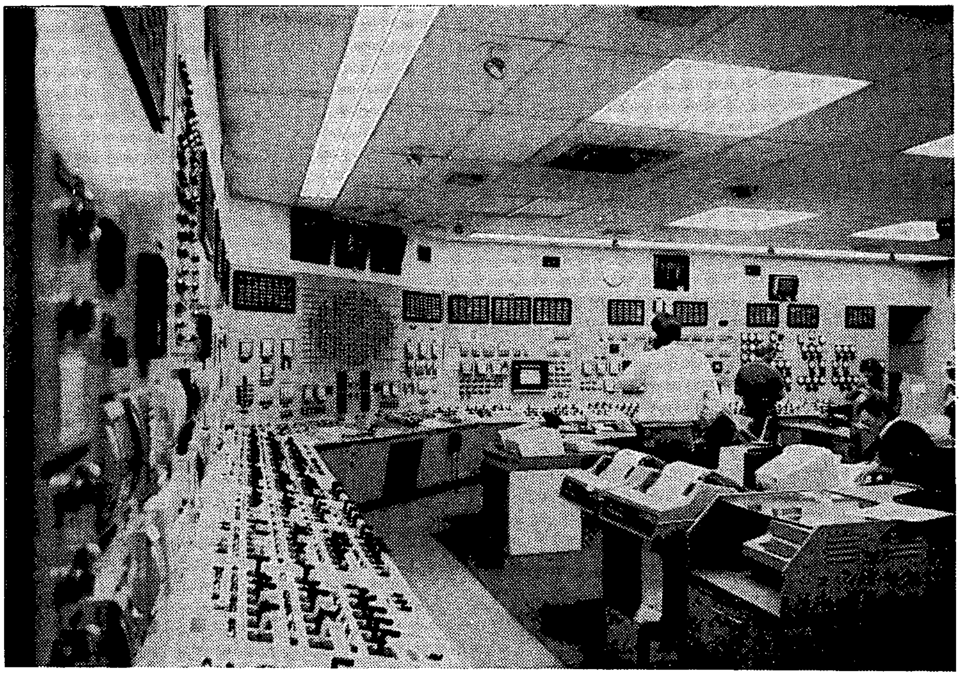

Figure 6-9. Current Control Room View: Emergency Core Cooling System (Foreground); Nuclear and Generation Components (Background)

The magnitude of the project requires a concentrated effort from many plant departments while dictating that these changes be implemented with a minimum of disruption to plant operations and staff during the interim period.

Discrepancies identified in the review will be corrected in a timely manner consistent with safe plant operation.

6.2.2. Integrated Schedule

Large-scale Detailed Control Room Design Review corrections during the 1987 fueling cycle outage are not planned. Implementation of the plant modification process, construction planning and scheduling after the receipt of the NRC review results and approval of this summary report precludes significant modification projects in 1987. Monticello will, however, use the 1987 outage for collection of necessary information to aid in future control room modifications.

Monticello has already consulted outside expertise in the repair of existing control room panels. Based on this information, Monticello intends to pursue a conservative approach for modifying control room panels. Monticello presently plans on modifying a portion of one panel initially, using the acquired experience to gauge future repairs in the area of task scheduling, worker productivity, equipment installation problems, and control room disruption. Additional modifications will be done on a panel-by-panel basis during future plant outages.

Attempting to establish a defined schedule of what panels would be repaired during any particular outage would not be meaningful at this time. As Monticello gains knowledge in the process of control room panel repair, it should be expected that the overall control room design review improvement course should accelerate and a definitive schedule evolve.

Monticello intends to provide the NRC with periodic progress reports. It should be expected that these reports will provide quantitative scheduling as the project proceeds. Monticello believes this prudent approach to scheduling to be the best action in correcting the deficiencies indentified in the detailed control room design review.

The integrated plan for control room design improvements will include required modifications. The goal of the Control Room Design Review Committee is to have all the required modifications completed by the end of 1996.

In addition, relabeling and meter scale replacement to comply with the Monticello Human Engineering Design Requirements and Conventions Specification will be done on a continuing basis as plant and system conditions allow. The conventions specifications will be used as a guide for future modifications to the control room.

SECTION 7
LIST OF ABBREVIATIONS

System Abbreviation	System Title
345/230/115 kV SUBSTATION	345/230/115 kV Substation
4.16 kV STATION AUX	4.16 kV Station Auxiliary
4.16 kV STN	4.16 kV Station
480 V AC STATION AUX	480 VAC Station Auxiliary
480 V STN	480 V Station
ANNUNCIATOR SYS	Annunciator System
APRM	Average Power Range Monitor
APRS	Auto Pressure Relief System
ARM	Area Radiation Monitor
ATWS	Anticipated Transient Without Scram
BWR	Boiling Water Reactor
CGCS	Combustible Gas Control System
CIRC WATER	Circulating Water
COMPUTER	Computer
COND & FW	Condensate and Feedwater
COND STOR	Offgas Condensate Storage
CRD	Control Rod Drive
CRW	Clean Radioactive Waste
CS	Core Spray
DG	Diesel Generator
DIESEL OIL	Diesel Oil
DMIN WTR STOR	Demineralized Water Storage
EOP	Emergency Operating Procedures
ERG	Emergency Response Guideline
ESW	Emergency Service Water
FPS	Fire Protection System
FW	Feedwater
GEN	Generation
GEN H2 CLG	Generator Hydrogen Cooling
GEN H2SO	Generator Hydrogen-Seal Oil
GEN STATOR	Generator Stator
GEN STATOR CLG	Generator Stator Cooling
GRW	Gaseous Radioactive Waste
HCU	Hydraulic Control Unit
HED	Human Engineering Discrepancy
HPCI	High-Pressure Coolant Injection
HVAC	Heating, Ventilation, and Air Conditioning
I & SERV AIR	Instrumentation and Service Air
INST & SERVICE AIR	Instrumentation and Service Air
IRM	Intermediate Range Monitor
LARGE MTR MON	Large Motor Monitor
LPRM	Local Power Range Monitor
LRW	Liquid Radioactive Waste
MCOND	Main Condenser

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System Abbreviation	System Title
MS	Main Steam
MS PRESS CTRL	Main Steam Pressure Control
MSIV	Main Steam Isolation Valves
N2 SAMPLE	Nitrogen Sample
OG	Offgas
OFFGAS COMP STOR	Offgas Compressor Storage
PC	Primary Containment
PCTMT	Primary Containment
PCTMT CLNG & VENT SYS	Primary Containment Cooling and Ventilation
PLANT MAKEUP	Plant Makeup
PLANT PROTECTION	Plant Protection
POST LOCA H2/02 CTRL	Post Loss of Coolant H2/02 Control
POWER METER	Power Meter
PRM	Process Radiation Monitor
PROCESS COMPUTER	Process Computer
RBCCW	Reactor Building Closed Cooling Water
RBM	Rod Block Monitor
RCIC	Reactor Core Isolation Cooling
RECIRC	Recirculation
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
RPIS	Rod Position Information System
RPS	Reactor Protection System
RPV	Reactor Pressure Vessel
RV&A	Reactor Vessel and Assembly
RWCU	Reactor Water Cleanup
RWM	Rod Worth Minimizer
RX LEVEL CTRL	Reactor Level Control
RX MAN CTRL	Reactor Manual Control
RX RECIRC	Reactor Recirculation
SECONDARY CONTAINMENT	Secondary Containment
SGTS	Standby Gas Treatment System
SBLC	Standby Liquid Control
SPDS	Safety Parameter Display System
SRM	Start-up Range Monitor
SW	Service Water
TIP	Traversing Incore Probe
TURB	Turbine
TURB CNTRL	Turbine Control
TURB HD SPRAY	Turbine Hood Spray
TURB LUBE OIL	Turbine Lube Oil
TURB SEAL STEAM	Turbine Seal Steam
TURB TURNING GEAR	Turbine Turning Gear
TURBINE VALVES	Turbine Valves

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APPENDIX A
QUALIFICATIONS OF CONTROL ROOM DESIGN REVIEW AND SIGNIFICANT CONTRIBUTORS

LAWRENCE L. NOLAN

POSITION: Superintendent, Nuclear Technical Services
Monticello Nuclear Generating Plant
Northern States Power Company

EXPERIENCE HIGHLIGHTS:

BS, Chemical Engineering, University of Minnesota
MS, Chemical Engineering, Oregon State University
Four years USN Nuclear Power Program
Seventeen and one-half years at Monticello Nuclear Power Plant in various engineering positions
Current SRO license at Monticello Nuclear Plant

PROFESSIONAL EXPERIENCE:

Fourteen years as an operations engineer on the Monticello plant staff in various capacities, including preoperational testing, procedure writing and technical assistance to operational and maintenance personnel.

From July 1976 to August 1983, he was responsible for operational engineering support for all the Solid, Liquid and Gaseous Radwaste Treatment Systems and the water processing filter-demineralizers, reactor water cleanup system filter-demineralizers and the fuel pool filter-demineralizers.

In September 1983, he assumed the position of Superintendent, Nuclear Technical Services, which is a plant support group for projects that are long term and/or not directly related to routine plant operations. This group presently consists of nine engineers, two senior operation specialists, one technical support supervisor and one engineer associate and is involved in a wide variety of plant studies and modifications.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

Mr. Nolan presented papers at: The American Nuclear Society Executive Conference on Decontamination of Power Reactors; The Costs, Benefits and Consequences, September 1984 (Planning for BWR Decontamination).

- The EPRI BWR Owner's Group for IGSCC Research Seminar on Chemical Decontamination of BWRs, February 1985.
- The American Nuclear Society 1983 Winter Meeting (Shift Technical Advisor at the Monticello Nuclear Generating Plant).
- The 1982 ANS Winter Meeting (Evaluation of an Asphalt System for an Operating BWR).

RAY K. ROGERS

POSITION: Senior Operations Specialist
Nuclear Technical Services
Monticello Nuclear Generating Plant
Northern States Power Company

EDUCATION:

Balsam Lake High School, Balsam Lake, WI
Steam Engineering I and II St. Cloud Vocational School, St. Cloud, MN
Electricity I, II, and III, Anoka Vocational School, Anoka, MN

NUCLEAR TRAINING:

Northern States Power Company Nuclear Training School
Pathfinder Nuclear Plant, Sioux Falls, SD
General Electric Boiling Water Reactor Technology School, San Jose, CA
General Electric Boiling Water Reactor Training School, Morris, IL

HUMAN FACTORS TRAINING:

Human Factors Engineering
Engineering Summer Conference, 1984
University of Michigan (Ann Arbor)

Human Performance and Nuclear Safety Extension Course
University of Wisconsin (Madison), 1981

Boiling Water Reactors Owners Group, 1983
Control Room Human Factors Seminar, Tulsa, OK

Boiling Water Reactors Owners Group, 1980
Control Room Human Factors Seminar, Joliet, IL

EMPLOYMENT HISTORY:

1981 - Present Senior Operations Specialist
Nuclear Technical Services
Monticello Nuclear Plant

1979 - 1981 Senior Operations Specialist
Nuclear Technical Services
Prairie Island Nuclear Plant

1978 - 1979 Senior Operations Specialist
Northern States Power Company
Tyrone Nuclear Plant Operations Task Force
Primary responsibilities: Reviewing systems design and operations, writing and reviewing system operating and maintenance procedures.

1977 - 1978	Shift Supervisor Monticello Nuclear Plant
1968 - 1978	Lead Plant Equipment and Reactor Operator Monticello Nuclear Plant SRO License, 1970 - 1979
1974 - 1977	Supervisor, Radwaste Processing, Monticello Including solidification and off-site shipping
1955 - 1968	Assistant Steam Plant Operator Northern States Power Company, Whitney Steam Plant

PROFESSIONAL CREDENTIALS

SRO Licensed Monticello Nuclear Plant, 1970 - 1979
SRO Certified, Dresden Nuclear Plant, 1968
State of Minnesota Chief A Engineer, Licensed 1966 - 1987

EUGENE B. EARNEY

POSITION: Superintendent, Training
Monticello Nuclear Generating Plant
Northern States Power Company

EDUCATION:

Prescott High School, Prescott, Wisconsin
18 years in the nuclear power industry
Monticello SRO license

EMPLOYMENT HISTORY:

1975 - 1978 Lead Plant Equipment and Reactor Operator

1978 - 1980 Plant Training Supervisor

1980 - Present Mr. Earney was promoted to Superintendent of Training in 1980 and as such has responsibility for the operation of the Monticello Training Center. This responsibility includes the supervision of more than 25 permanent training center personnel as well as several contract instructors. He is also responsible for the development and implementation of all the various training programs offered to Monticello Nuclear Plant staff.

Mr. Earney has been heavily involved in the design, construction and equipping of a training center for the Monticello Plant. He is heavily involved in the design, procurement and testing of a plant-specific simulator for the Monticello Plant. This also includes benchmarking the simulator to actual plant transients.

BILL J. HILL

POSITION: Superintendent, Technical Engineering
Monticello Nuclear Generating Plant
Northern States Power Company

EXPERIENCE HIGHLIGHTS:

BSEE, University of North Dakota
Fifteen years in nuclear power industry
Current SRO license at the Monticello Nuclear Plant
Fifteen years experience in instrument and control maintenance and design
Participated as member of BWR Owners's Group Control Room Subcommittee

PROFESSIONAL EXPERIENCE:

Mr. Hill is currently the Superintendent, Technical Engineering, at the Monticello Nuclear Plant. He is responsible for the computer, instrument and control and nuclear engineering sections as well as instrument and control maintenance. The duties of his staff include performance monitoring, testing, maintenance, modification design and installation for systems and equipment assigned to the respective sections. Mr. Hill's prior supervisory duties were as Instrument Engineer at Monticello. This included supervision of the instrument and control technicians, development of surveillance and preventive maintenance programs for instrument and control systems and design modifications for assigned systems. Other experience includes: Operator training, system preoperating testing, start-up testing and system engineering for selected systems at Monticello. Participated for 3 years as a member of the BWR Owners's Group Control Room subcommittee, which developed an HFE survey program and SPDS displays for the control room.

DOUGLAS D. ANTONY

POSITION: General Superintendent, Operations
Monticello Nuclear Generating Plant
Northern States Power Company

EXPERIENCE HIGHLIGHTS:

Bangor High School
University of Wisconsin (LaCrosse), Preengineering
University of Wisconsin (Madison), BS, Nuclear Engineering
SRO License to operate the Monticello Nuclear Generating Plant
American Nuclear Society Membership

PROFESSIONAL EXPERIENCE:

April 1983 - Present	NSP, General Superintendent, Operations. Supervises Operations Group for the Monticello Plant. Total group is 59.
July 1983 - April 1983	NSP, Superintendent, Operations Engineering. Supervised engineering staff that provided operating support to the Monticello plant. Staff of 18 engineers and three engineer associates.
June 1969 - July 1973	NSP, Engineer. Performed engineering duties at the Monticello Nuclear Generating Plant.
January 1966 - June 1969	While attending the University of Wisconsin, he held several part-time jobs. These included: Accountant, Oscar Meyer Corporation; Postal Clerk/Carrier; U.S. Post Office; Mechanic, Northwest Elevator Company.
May 1962 - May 1965	U.S. Army, Specialist. Radar specialist, U.S. Army Air Defense Command.

NUCLEAR TRAINING;

Managing Management Times (2 days), completion certificate.
Nuclear Environmental Qualification (1 day), completion certificate.
Abnormal Events Analysis (3 days), completion certificate.
Qualified Vibration Analyst Certificate (2 days), IRD Mechanalysis, Inc.
Analytic Troubleshooting (2 days), completion certificate, NSP.

Supervisory Management Program (2 days), certificate, NSP.
Control Room Management (2 days), attendance certificate, GE.
Basic IMS Training (6 days), NSP.
PRIDE (5 days), NSP.
Numerous miscellaneous PRIDE modules (1- and 2-day sessions).

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

Presented a paper at the 40th International Water Conference (1979) (Evaluation of the Filter/Demineralizer Precoat Materials on Monticello Nuclear Station Condensate System).

Guest Speaker at the NUS BWR Offgas Workshop, January 1976.

RICHARD GORANSON

POSITION: Senior Production Engineer
Monticello Nuclear Generating Plant
Northern States Power Company

EXPERIENCE HIGHLIGHTS:

BME, University of Minnesota
Fifteen years in nuclear power industry
Eleven and one-half years experience at Monticello Nuclear Plant
Current SRO license at Monticello Nuclear Plant
Responsible for development of Emergency Operating Procedures
Responsible for Abnormal Operating Procedures
Former engineering group supervisor

PROFESSIONAL EXPERIENCE:

Mr. Goranson, Senior Production Engineer, Northern States Power Company's Monticello Nuclear Generating Plant, is responsible for development and implementation of Emergency Operating Procedures. These procedures are developed from the Emergency Procedure Guidelines developed by the BWR Owner's Group Emergency Procedures Committee. Mr. Goranson has been a member of the Emergency Procedures Committee since 1984 and is currently the chairman of that committee.

Mr. Goranson is also responsible for other integrated operating procedures, including plant start-up, plant shutdown and Abnormal Operating Procedures.

Mr. Goranson has held a Senior Reactor Operator's license for the Monticello Plant since March 1983.

From 1980 to 1985, Mr. Goranson was responsible for a staff of four electrical and mechanical engineers. This staff was responsible for all plant electrical systems, mechanical service systems and the integrated plant operating procedures for plant start-up, shutdown and abnormal conditions and Emergency Operating Procedures. Other experience includes: System engineer for various mechanical and electrical systems at Monticello; served as Operations Committee member when the Superintendent, Operations Engineering, was not available; and attended training seminars sponsored by the BWR Owner's Group on Emergency Operating Procedures.

Mr. Goranson served in the U.S. Army as a Nuclear Power Plant Operator for 3 years.

TRAINING:

Shift Technical Advisor training.

Senior Reactor Operator's license since June 1972; participated in Requal Program.

Refueling Activities Course (5 days); completion certificate, GE.

Managing for Productivity (4 days); completion certificate, ODI.

DONALD O. ROISUM

POSITION: Day Lead Plant Equipment and Reactor Operator
Monticello Nuclear Plant
Northern States Power Company

EDUCATION:

New London High School, New London, Minnesota
Basic AC Electricity, NATO Signal School, Ansbach, Germany
Basic DC Electricity, NATO Signal School, Ansbach, Germany

NUCLEAR TRAINING:

Northern States Power Company, Nuclear Training School
Pathfinder Nuclear Plant, Sioux Falls, South Dakota
General Electric BWR Technology Course, San Jose, California
General Electric BWR Training Course, Morris, Illinois

EMPLOYMENT HISTORY:

1985 - Present	Day Lead Equipment and Reactor Operator Monticello Nuclear Plant
1968 - 1985	Lead Plant Equipment and Reactor Operator Monticello Nuclear Plant
1957 - 1968	Plant Equipment Operator Blackdog Fossil Generating Plant
1955 - 1957	Military Service U.S. Army
1952 - 1955	Apprentice Plant Attendant and Assistant Plant Equipment Operator Riverside Generating Plant

PROFESSIONAL CREDENTIALS:

Reactor Operator License, Monticello Nuclear Plant, 1970 - Present
State of Minnesota Chief A Engineers License, 1980 - Present

MICHAEL FREDE

POSITION: Member, Technical Staff
Energy Incorporated
Idaho Falls, Idaho

EDUCATION:

Attended Purdue University
Naval Nuclear Power School
Naval Nuclear Prototype Training
Night Classes, University of Idaho, Idaho State

EMPLOYMENT HISTORY:

April 1982 - Present	Energy, Inc.
June 1980 - March 1982	Walsh Instrumentation/I&ESCo
August 1978 - June 1980	Argonne National Laboratory
March 1970 - August 1978	U.S. Navy

EXPERIENCE:

Mr. Frede has over 16 years experience in the construction, start-up, maintenance and administrative aspects of nuclear power plants. His experience has been primarily at plant sites as a field employee at the Monticello, Byron Station, Palo Verde, and Three Mile Island nuclear generating stations.

Mr. Frede's background includes computer programming, procedure writing, plant instrumentation, system testing, quality control auditing, maintenance and plant security.

During his employment for the Monticello Detailed Control Room Design Review, Mr. Frede aided in the investigation of Human Engineering Discrepancies, tracked component moves by computer data base and full-scale control room mock-up and provided support to the DCRDR Committee.

Prior to providing consulting services to the nuclear utility industry, Mr. Frede was employed by Argonne National Laboratory at the Experimental Breeder Reactor II and served in the U.S. Navy as a submarine nuclear propulsion plant supervisor and nuclear prototype instructor.

MICHAEL PERRY

POSITION: Senior Operations Specialist
Nuclear Technical Services
Monticello Nuclear Generating Plant
Northern States Power Company

EDUCATION:

Wright State University, December 1972
U.S. Navy Nuclear Program, December 1978
Licensed Operator Program at Brunswick Nuclear Plant, Carolina Power & Light, February 1980
Licensed Operator Program at St. Lucie Nuclear Plant, Florida Power & Light, June 1981
Senior Operator Program at Monticello Nuclear Plant, Northern States Power, July 1984
Tii 1, University of Wisconsin, Eau Claire, September 1984
Tii 3, University of Wisconsin, Eau Claire, July 1986

EMPLOYMENT HISTORY:

August 1986 - Present	Senior Operation Specialist Nuclear Technical Services Monticello Nuclear Plant Northern States Power Company
August 1983 - 1986	Operations Instructor Monticello Training Center Northern States Power Company
March 1981 - 1983	Reactor Operator St. Lucie Nuclear Plants Florida Power & Light
March 1978 - 1981	Operator Brunswick Steam Electric Plant Carolina Power & Light

EXPERIENCE:

Mr. Perry is currently the Senior Operations Specialist in the Nuclear Technical Services Staff at Northern States Power Company's Monticello Nuclear Generating Plant. He has held supervisory positions at the plant and at the Monticello Training Center and is a current member of the BWROG SFRC. He has nuclear experience as a licensed operator in both BWR and PWR reactors.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

Has a SRO license at Monticello Nuclear Plant; has held a cold RO license and a hot RO license at Florida Power & Light's St. Lucie units 1 and 2.

RONALD JAMES UGLOW, JR.

POSITION Start-up Test Engineer
Operations Engineering
Monticello Nuclear Generating Plant
General Electric Company

EDUCATION:

BS, Ocean Engineering, U.S. Naval Academy, June 1978
Naval Nuclear Power School, Orlando, FL, February 1979
Naval Nuclear Prototype, Qualified Engineering Officer of the Watch, August 1979
Senior Reactor Operator certification, BWR 6

EMPLOYMENT HISTORY:

September 1983 - Present	Startup Test Engineer, General Electric Company
June 1982 - June 1983	Electronic Warfare Officer, U.S. Navy, USS Virginia
March 1980 - June 1982	Repair Division Officer, U.S. Navy, USS Nimitz

EXPERIENCE:

General Electric: Worked as an engineering consultant for Northern States Power; was responsible for writing and implementing Emergency Operating Procedures and support documentation.

U.S. Navy: Standard Engineering Officer of the Watch duty; division officer responsible for approximately 90 enlisted personnel.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

Senior Reactor Operator certification on BWR 6.

Professional Engineer, State of Minnesota, in mechanical engineering.

STEPHEN V. METZ

POSITION: Senior Development Engineer
Corporate Systems Development Division
Honeywell Inc.

EDUCATION:

1981 - Present Doctoral candidate
Psychology
University of Minnesota

Graduate coursework completed:

- Statistical Methods
- Experimental Design
- Perception
- Cognition (Learning and Memory)
- Speech Perception
- Observational Methods
- Seminar in Philosophy of Science
- Language and Linguistics
- Biological Determinants of Human Behavior
- Independent Research in Event Perception and Speech

1975 BA, Psychology
St. Olaf College

EMPLOYMENT HISTORY:

June 1985 - Present
Senior Development Engineer
Ergonomics Section
Corporate Systems Development Division
Honeywell Inc.

June 1983 - May 1985
Development Engineer
Ergonomics Section
Technology Strategy Center
Honeywell Inc.

September 1982 - May 1983
Research Associate
Ergonomics Section
Technology Strategy Center
Honeywell Inc.

May 1980 - August 1982
Research Associate
Man-Machine Sciences Group
Systems and Research Center
Honeywell Inc.

EXPERIENCE:

Mr. Metz has a thorough background and extensive experience in the human factors aspects of industrial control centers, workplaces, and both conventional and advanced man-machine systems.

Mr. Metz serves as the Honeywell project manager for the control room design review at Monticello Nuclear Generating Plant under contract with Northern States Power Company. He has been involved with the project since its start in December 1984 and has been responsible for all phases of the project, including human engineering review of the control room, assessment of human engineering discrepancies and recommendations of resolutions. He is a member of the Monticello Control Room Design Review Committee.

While at Honeywell's Technology Strategy Center, Mr. Metz participated in several power industry projects. Under internal research funding, he developed the Honeywell Voice Interactive Maintenance Aiding Device (VIMAD) system for electric utility applications. These applications include procedural aiding and diagnostic support for maintenance and operating activities.

Under contract with Northern States Power, he has participated in the evaluation and review of the control rooms at the Prairie Island and Monticello Nuclear Generating Plants. This work provided experience with the human factors of control room components and procedures. Additionally, he has been a key contributor to an EPRI-sponsored effort for human factors guidelines for fossil-fired power plant design. Mr. Metz has also participated on the EPRI-funded evaluation of the colorgraphics display and control system at the 10-MWe Solar Pilot Plant and an EPRI-funded review of the application of speech technology in electric utility power dispatch control centers.

While at Honeywell's Systems and Research Center, Mr. Metz participated in several experimental studies of voice interactive systems for the Naval Air Development Center. He evaluated navigation changes during simulated flight using automated voice recognition/generation equipment. Additional experience at the Systems and Research Center includes the preparation of technical literature and technology reviews and human factors guidelines for display and control devices, including a comprehensive application guideline document.

Prior to joining Honeywell, Mr. Metz was a research assistant at the University of Minnesota where he conducted research in speech perception, acoustic analysis, speech production and related topics.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

- Human Factors Society (Member)
- Computer Systems Technical Group--Human Factors Society (Member)
- Consumer Products Technical Group--Human Factors Society (Member)
- Association for Computing Machinery (Member)

Mr. Metz has published approximately 15 research papers and technical reports in the areas of control room review, design guidelines and applications of new technology for interface design.

THOMAS R. EDMAN

POSITION: Former Supervisor, Cognitive Systems Section
Human Interface Systems Group
Technology Strategy Center
Honeywell Inc.

EDUCATION:

1980 PhD, Experimental Cognitive Psychology
University of Minnesota

1970 BA, English
University of Notre Dame

EXPERIENCE:

Dr. Edman was the supervisor of the Honeywell Technology Strategy Center's Cognitive Systems section during the first 2 years of Honeywell's support of the Monticello Detailed Control Room Design Review. Before his transfer to another Honeywell division, he led a group of ten staff scientists and engineers who are pursuing empirical, advanced development and research in the areas of human-computer interaction, man-machine devices, control/display systems and human factors evaluations. Dr. Edman provided his personal leadership to a pioneering Honeywell effort to develop an expert systam for preventive maintenance and diagnosis of a large refrigeration system. In this role, he has directed a team of psychologists and software engineers in the construction and testing of the expert system, which is to be used in Honeywell's maintenance business for the subject equipment. This expert-system-based maintenance system was installed in over 200 Honeywell branch offices nationwide and is the foundation of subsequent Honeywell activities involving expert system applications.

Dr. Edman is also highly qualified in speech systems technologies. He has over 12 years of experience in speech processing research and development. He has contributed significantly to the study of speech processing and production and has designed, developed and implemented several experimental speech recognition systems. An early recognition system developed by Dr. Edman was distinguished through the application of charge-coupled devices to perform acoustic preprocessing and spectral characterization in a speaker-dependent, isolated-word recognition system. More recently, he led a 2-year program to investigate a linguistic-based approach to achieving speaker-independent recognition.

Dr. Edman's interest in voice systems includes identifying, designing and evaluating candidate applications for speech recognition and synthesis. He was an early contributor to Honeywell's development of an application identification methodology and has applied the resulting methods in areas of military avionics, manufacturing and production and CRT-based control and display systems. He has also designed human factors studies to compare voice and manual data entry techniques, led an effort to study the feasibility of using voice warning systems in aircraft cockpits and published guidelines for speech recognition and synthesis applications. His responsibilities have included the design and implementation of a prototype speech store and forward system for voice messaging and the analysis and design of the user terminal for a digital PBX systam.

Dr. Edman's professional interests also encompass human factors studies of large and small control room environments. He was a principal investigator for Northern States Power Company's human factors control room review, the "Human Engineering Guide for Enhancing Nuclear Control Rooms" program conducted under EPRI sponsorship, and a human engineering review of a vehicular traffic management control room for the Minnesota Department of Transportation.

Dr. Edman has made major technical contributions to the integration of advanced man-machine interfaces in complex control envirouments. This work has included data gathering (task analysis, interviews, checklists); redesign and functional definition for equipment, control panels and workspace; and analytical and empirical studies of graphic display systems. He also maintains special interest in European activities in industrial ergonomics and has conducted a workshop entitled, "European Research in Process Control--Human Interactions with Computer-Based Systems," for the Human Factors Society and also chaired a special session at the 1982 annual Human Factors Society meeting on the control room of the future.

While pursuing his doctorate, Dr. Edman was the project director of the University of Minnesota Speech Perception Laboratories. In this role, he was responsible for hardware and software engineering in that speech laboratory and for psychological investigations of human speech processing.

CHRISTOPHER G. KOCH

POSITION: Principal Development Engineer
Corporate Systems Development Division
Honeywell Inc.

EDUCATION:

1980 - Present — Rice University, Houston, Texas
Degree research--currently completing degree requirements for a PhD in Engineering Psychology

1975 - 1979 — Rice University, Houston, Texas
Completed 96 credits of graduate degree coursework and research

Graduate coursework included:
- Statistics and Experimental Design
- Bayesian Statistics
- Nonparametric Statistics
- Advanced Experimental Design
- Topics in Engineering Psychology
- Human Performance Theory
- Human Learning and Memory
- Cognitive Psychology
- Topics in Industrial/Organizational Psychology
- Personnel Selection and Placement
- Personnel Training
- Job Design
- Social Psychology

June 1975 — BA, Psychology
University of Notre Dame

EMPLOYMENT HISTORY:

February 1986 - Present — Principal Development Engineer
Artificial Intelligence Group
Corporate Systems Development Division
Honeywell Inc.

February 1984 - February 1986 — Senior Development Engineer
Human Interface Systems Group
Technology Strategy Center
Honeywell Inc.

February 1982 - January 1984 — Development Engineer
Ergonomics Section
Technology Strategy Center
Honeywell Inc.

September 1981 - January 1982	Research Scientist Man-Machine Sciences Group Systems and Research Center Honeywell Inc.
September 1979 - August 1981	Research Associate Man-Machine Sciences Group Systems and Research Center Honeywell Inc.
August 1978 - August 1979	Research Intern Man-Machine Sciences Group Systems and Research Center Honeywell Inc.
January 1978 - July 1978	Management Skills Training Specialist Administrative/Training Department Carter Oil Co. (Exxon Subsidiary) Houston, Texas

EXPERIENCE:

Mr. Koch has broad experience in human factors design and evaluation of control rooms for many applications. He continues to serve as the Honeywell project manager for the control room design review at Prairie Island Nuclear Generating Plant under contract with Northern States Power Company. He has been involved with the project since its start in June 1982 and was responsible for all phases of the project, including human engineering review of the control room, assessment of human engineering discrepancies and determination of resolutions. He is a member of the Prairie Island Control Room Design Review Committee.

Mr. Koch managed a project to evaluate the colorgraphics display and digital control system developed for the 10-MWe Solar Pilot Plant in Barstow, California. The focus of the evaluation was the advanced CRT-based control consoles used for control and monitoring of the entire power plant. This project was sponsored by the Electric Power Research Institute Advanced Power Systems Division and was conducted from September 1983 to December 1984.

Mr. Koch has conducted a multiyear internal research and development project targeted for utility control room CRT applications. During this project, he investigated operator performance effectiveness of alternative formats for CRT display of process trend data and examined information transmission characteristics of control room annunciator and alarm systems.

Mr. Koch has also provided human factors assistance for the expansion of the control room for the metropolitan area freeway management system under contract with Minnesota Department of Transportation.

Mr. Koch is an expert in user interface design for computer-based operating, training, aiding and maintenance systems. He has led design projects for systems ranging from lap-size microcomputers to main frame process control computers. He served as human factors specialist for a project to develop the user interface for a computer-based expert system for gas turbine power plant electronic controls maintenance and troubleshooting. He was responsible for developing design concept specifications for the interface--a portable graphics and video unit with speech recognition and synthesis. This project is sponsored by the Electric Power Research Institute. Mr. Koch has designed and demonstrated a colorgraphics interface for factory manufacturing automation using the Honeywell TDC 3000 total distributed process control system. He also designed the user interface for an expert system applied to building services refrigeration equipment using a portable microcomputer as the delivery vehicle.

Mr. Koch worked at the Honeywell Systems and Research Center in several large-scale interface design projects sponsored by the military. He managed two contracts funded by the U.S. Army Research Institute dealing with computer-based training and testing systems. On one project, he developed the Army's first embedded training and testing capability to be implemented in the field; its application was the TACFIRE tactical fire direction system. On the second, he conducted a feasibility study for embedded training on an Army Air Defense missile systam. Prior to these efforts, he worked on concept definition of an electronic equipment maintenance training system for Navy Class A technicians.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

- Human Factors Society (Member)
- Upper Midwest Chapter--Human Factors Society (Director)
- Computer Systems Technical Group--Human Factors Society (Member)

Mr. Koch has published over 30 research papers and technical reports in the areas of control room review, colorgraphics applications for process control, interface design for electronic maintenance and troubleshooting, process trend data display, computer-based skill qualification testing and electronic equipment maintenance training. He has presented research results at seven professional conferences and conventions.

ROSE MAE M. RICHARDSON

POSITION: Development Engineer
Corporate Systems Development Division
Honeywell Inc.

EDUCATION:

1984 - Present	PhD Candidate, Developmental Psychology University of Minnesota
1984	MA, Developmental Psychology University of Minnesota
1978	BA, Psychology University of Colorado

EMPLOYMENT HISTORY:

September 1984 - Present	Development Engineer Corporate Systems Development Division Honeywell Inc.
June 1983 - September 1984	Research Associate Technology Strategy Center Honeywell Inc.

EXPERIENCE:

Ms. Richardson has an extensive background in both the design and evaluation of the man-machine interface, including equipment front panels, CRT displays, software transactions and interactive devices. She has applied her human factors expertise in a variety of applications ranging from the design of individual pieces of equipment to the evaluation and modification of industrial control centers.

Ms. Richardson is currently the principal investigator for a Honeywell internal development project to develop and demonstrate a software package that will aid designers in the rapid design and simulation of user interface prototypes for small front panels. This rapid prototyping capability is being developed to assist human factors specialists, design engineers and other nonprogrammers. To eliminate the need for the end user to enter or interpret the programming language, the software interface will be graphically based and incorporate state-of-the-art techniques such as icons, pop-up menus and form-filling. The rapid prototyper is being developed using an object-oriented programming language that allows software modules to communicate with one another without the user explicitly calling up executive routines. This capability facilitates the development of generic software templates, which specify the geometry of each man-machine interface component in the rapid prototyper's inventory, its modes of operation, and the information flow into and out of each component. This user interface rapid prototyper will enable a designer to mock up a dynamic simulation of a proposed user interface design, test both the physical layout and the dialogue structure of that design, and if desired, modify the design mock-up.

Ms. Richardson was the principal investigator for a keyboard comparison study conducted for the U.S. Postal Service. The primary focus of this project was the development of optimal character assignment schemes for a data entry task based on character frequency and anthropometric characteristics of the human hands. Ms. Richardson was also a key contributor in an internal Honeywell research project comparing the effects of different keyboard technologies on user preference and performance in typing tasks.

Ms. Richardson participated in the evaluation and review of the control rooms at the Prairie Island and Monticello Nuclear Generating Plants. In particular, she has been involved in component checklist development, control room survey activities and development of a control room convention specification. Prior to this, she was a key contributor to an EPRI project to evaluate the colorgraphic and digital control system at the 10-MWe Solar Pilot Plant in Barstow, California. In addition to evaluating the plant control system, this project involved the implementation and assessment of an evaluation methodology developed by EPRI.

Ms. Richardson has also contributed to the design of both the hardware and software interface on various potential Honeywell products.

Prior to joining Honeywell, Ms. Richardson was a research assistant at the University of Minnesota, where she conducted research in the areas of auditory perception, visual perception and social development. While at the University of Minnesota, Ms. Richardson also taught courses in developmental psychology.

PROFESSIONAL CREDENTIALS/AFFILIATIONS:

Human Factors Society (Member)

DANIEL R. BAKER

POSITION: Research Intern
Corporate Systems Development Division
Honeywell Inc.

EDUCATION:

August 1986	MSE, Industrial and Operations Engineering (Ergonomics) University of Michigan, Ann Arbor, Michigan
August 1985	BSE, Industrial and Operations Engineering University of Michigan, Ann Arbor, Michigan

EMPLOYMENT HISTORY:

September 1986 - present	Research Intern Corporate Systems Development Division Honeywell Inc.
May 1985 - August 1986	Research Assistant Mercury Worker's Health Project Department of Industrial and Operations Engineering University of Michigan
May 1984 - July 1986	Engineer Daniel R. Baker Ann Arbor, Michigan
August 1986 and August 1985	Staff member under R. W. Pew University of Michigan Human Factors Short Course Chrysler Center for Continuing Engineering Education
January 1985 - April 1985	Grader for a Human Performance Class Department of Industrial and Operations Engineering University of Michigan

EXPERIENCE:

Mr. Baker has a varied background in human factors design and evaluation of work spaces for many different applications. He is currently a member of the detailed control room design review team for the Monticello Nuclear Generating Plant under contract with Northern States Power. He has been involved with the project since joining Honeywell in September 1986.

Mr. Baker was in charge of data reduction and instrumentation for some of the physiological tests for the Mercury Worker's Health Project at the University of Michigan. His duties included writing programs to reduce and summarize the raw data before uploading to a main frame for further statistical analysis and to build/repair the test equipment. He also helped in the development and administration of these tests.

Mr. Baker has a strong background in safety as it applies to industrial situations. He has worked for a consulting firm for several years on cases that involved safety and human factors issues. Among his duties were to design and run experiments to anawer human factors questions, build and test the equipment and research the specific topic areas under investigation. He has also done some consulting on his own. The areas in which he consulted were job analysis and redesign for several small manufacturing firms under contract from a health care firm and safety analysis of truck tractor and trailer climbing systems.

Mr. Baker has helped teach seminars in human factors and has been a grader for a human performance course. He plans to pursue a PhD in the field of human performance and man-machine interaction.

PROFESSIONAL AFFILIATIONS/CREDENTIALS:

- Human Factors Society
- Institute of Industrial Engineers

Mr. Baker has published five research papers and technical reports in the areas of command language formatting, work place design, and control room review. He has presented research results at a professional conference.

APPENDIX B
DATA COLLECTION FORMS USED DURING HUMAN ENGINEERING REVIEW

SAMPLE BWROG INTERVIEW FORMS
OPERATOR INTERVIEW QUESTIONNAIRE

A. Would you recommend any changes in the following areas:
- A1. shift coverage
- A2. shift turnover
- A3. training
- A4. color coding
- A5. control room access
- A6. control panel layout or access
- A7. communication systems
- A8. heating or ventilation
- A9. lighting or noise levels
- A10. special test equipment
- A11. maintenance or surveillance testing
- A12. data recording and log entries
- A13. information flow
- A14. furniture, equipment or work space
- A15. computers
- A16. other?

B. Are any controls difficult to operate?

C. Are any controls designed, positioned or labeled in a manner that causes risk of inadvertent operation?

D. Are any recorders or indicators difficult or confusing to read?

E. Are any important indicators located such that they are difficult to see during normal or emergency operation?

F. Do you feel any control room displays are necessary, provide unimportant information or needlessly clutter the control panels?

G. Based on your operational experience, does your control room lack any controls or displays needed in your response to normal or emergency situations?

H. Do you consider the annunciator system to be effective in conveying important information to you?

I. Do you have any problems locating or using procedures or operational instructions?

J. Are individual responsibilities and chain-of-command clearly understood during all operating conditions?

K. Is there an adequate number of operators available in the control room (or immediately available) to effectively operate the plant during all conditions?

L. Are you required to perform any duties that you consider unreasonable or distracting in your responsibility as an SRO or RO?

M. Based on your operational experience, have any errors or incidents occurred which could have been averted through improved control room design?

N. Have you experienced any problems using or understanding your procedures?

O. Is there a particular panel which you consider more difficult or confusing to operate than the others?

P. General Comments:

SAMPLE HONEYWELL INTERVIEW FORMS

OPERATOR INTERVIEW--INTRODUCTION

Hello, my name is ______________ (and this is ________________). I (We) work as Human Factors Specialist(s) for the Honeywell Technology Strategy Center. Presently, Honeywell is working with NSP in a joint effort to carry out a systematic control room review at Monticello Nuclear Generating Plant. This review complies with NRC regulations for human engineering evaluation of all operational aspects of the control room to ensure maximum safety and system reliability.

One aspect of the control room review is structured interviews with reactor operators since they are the most knowledgeable about operational problems encountered on a day-to-day basis. Consequently, we asked for your participation in these interviews to help us define problems that exist with your control room and possible remedial courses of action. Your responses will be kept anonymous and will be reported only in summary form in a final report on the control room review. Are there any questions?

BIOGRAPHICAL DATA

YOUR JOB TITLE: (RO, SRO, SHIFT SUPERVISOR, etc.) ______________________

YEARS OPERATIONAL EXPERIENCE:
NAVY NUCLEAR __________
FOSSIL PLANT __________
NUCLEAR PLANT __________

EDUCATIONAL BACKGROUND: ____

____

TOTAL WEEKS SIMULATOR TRAINING: ______________________________________

AGE: ________ HEIGHT: __________ WEIGHT ________

A. CONTROL ROOM DESIGN

1. How easy is it for you to move about the control room in the course of normal or emergency operations? Are there any major obstacles in your path?

2. Do you have any problems controlling the number of people in the control room during normal periods? During emergency periods?

3. Is the control room designed to restrict nonoperational personnel from coming into contact with the boards?

4. Are you required to leave the primary control boards to attend to instruments or displays on backracks or other areas away from the main control boards? What displays, if any, do you wish had been placed closer at hand?

5. During normal or off-normal operations, do the actions or tasks of another operator ever interfere with performance of your tasks?

6. Does each operator have a specific station or desk? Do the Shift Supervisor, Assistant Shift Supervisor, and Shift Technical Advisor have designated stations?

7. Can the status of the control boards be adequately monitored from each operational station?

8. Are all peripheral consoles, e.g., computer, properly arranged to allow effective operations?

9. Are rest rooms, kitchen, etc. properly arranged?

10. Have all necessary measures been taken to provide you with a pleasant, comfortable, or attractive working environment? What changes would you recommend?

B. CONTROL ROOM ENVIRONMENT

1. Is the noise level in the control room maintained at a reasonable level and free of annoying or distracting noises?

2. Do you have adequate control over room illumination? Can you avoid glare or reflections on display faces while maintaining overall illumination at a comfortable level?

3. Is the emergency backup illumination system properly designed to allow you to conduct operations effectively in an emergency illumination environment?

4. Have you experienced any problems with temperature, humidity, or ventilation in the control room on a year-round basis?

5. Have you had any problems with contamination in the control room? How easy is it to decontaminate rugs, etc.? Is the control room designed to allow you to operate it wearing a face mask?

C. CONTROL BOARD DESIGN

1. Is your control board shaped right to allow effective monitoring of displays and access to instruments and controls?

2. Are the major systems organized properly around the control boards for both normal and emergency operations?

3. Are there cases where you must be in two places at once because the panels aren't designed correctly or where two operators are required to do what one operator should be able to handle?

4. Are there cases where you must leave the primary control room area to attend to instruments in peripheral areas at just the wrong time?

5. Is your control board sized right so that controls and displays aren't placed beyond easy reach or visibility? If not, what aids do the operators use to read these displays and reach these controls?

6. Are the control boards too small, too large, or just about right to allow effective operations? Do the control boards allow free space for the addition of new control-displays that may be required?

D. PANEL DESIGN

1. Are the controls and displays on your boards arranged in a logical manner? Are the relationships between panel elements easy to spot?

2. In what ways have you had to modify the boards to make them easier to operate?

3. Have backfits to the boards been done in a logical manner or have these backfits made the boards harder to operate?

4. If you had a chance to redesign the panels, what changes would you make?

E. DISPLAYS

1. Based on your operational experience, are you lacking any important information displays that would help you conduct normal or emergency operations?

2. Do you find yourself out of visual range of important displays when you are conducting operations at one end of the console or the other or anywhere in between?

3. Have your displays been coded properly so that abnormal trends or malfunctions become immediately apparent to you?

4. Are your displays grouped properly and designed to allow you to make comparisons when necessary?

5. Do you have any operational problems with your chart recorders? Are some overloaded?

6. Are your meters designed and located to allow error-free readings?

7. Do you have any difficulties servicing displays, e.g., changing burned out lamps, inking recorders, etc.?

8. Do you feel that some displays are not needed and just add clutter to the boards?

9. When your meters or other displays fail, is it obvious to the operator?

F. CONTROLS

1. Have you experienced any problems with the design of the controls on the boards?

2. Are the controls designed and located so that it is not likely that an operator will grab the wrong one by mistake?

3. Are the controls designed and located to minimize chances of accidental disturbance?

4. Have all critical controls been guarded, covered or otherwise protected to prevent accidental activation?

5. Are all controls within each reach?

6. Are controls coded in any way that would help you differentiate between identical controls in the same general panel area?

7. Do some controls require too much or too little force to actuate them?

8. What control modifications have the operators made to reduce the possibility or errors?

G. ANNUNICATOR WARNING SYSTEM

1. What problems, if any, have you experienced with the design of your annunciator warning system?

2. During a major transient does your annunciator system provide too much, too little, or just the right amount of information?

3. How would you characterize the visual and auditory coding of alarms?

4. Are any important annunciators missing or located where they are not readily accessible to you?

5. Are you troubled with false or nuisance annunciators?

6. Has the annunciator control system been properly designed and located?

7. Do you have any problems reading or identifying annunciators while you are conducting normal or emergency operations?

8. Are the different auditory alarm signals easy to differentiate?

9. What measures do you feel should be undertaken to upgrade the annunciator-warning system?

H. LABELS

1. Were your boards labeled properly from the outset or did the operators have to add many labels?

2. Is the labeling clear, concise, and consistent or are there labels that could confuse the less-experienced operator?

3. How are labeling changes or additions coordinated?

4. What provisions do you have available for making new labels?

I. PROCEDURES

1. Do you have any problems finding or retrieving the procedures you need during normal or emergency situations?

2. Can you conveniently use procedures while operating the boards? Are procedures detachable and is there laydown space on the boards?

3. Are the procedures comprehensive and accurate to promote error-free operations?

4. Are operators required to memorize an unreasonable number of emergency operating procedures?

5. Do operators have the proper opportunity to write, review, and revise procedures based on operational experience?

6. Do the values and terminology used in procedures match those on the boards?

J. COMPUTER

1. In what ways does your computer help you in your operational duties?

2. Could your computer and associated readouts be upgraded in any way to be of greater assistance to you?

3. If the computer fails, are operators generally capable of manually performing the functions assigned to the computer?

4. Are your training programs adequate to allow you to make maximum use of the computer?

K. DESIGN CHANGES

1. When it becomes obvious to operators that a specific change in the control room is badly needed, e.g., a panel rearrangement of a different meter scale, how easy is it to get the change made?

2. Are operators encouraged or discouraged from modifying the boards?

3. Who keeps track of board changes, approves them, or coordinates approvals?

L. MANNING

1. Is the control room manning level adequate to handle the work load during normal and emergency periods across all shifts?

2. Is the operational manning sufficient to allow time for training, proper reliefs, vacations, and to avoid excessive overtime requirements?

3. Is there a clear-cut division of responsibility between the control room shift crew members?

4. Are operational crews selected to provide the best mix of talent and experience across the shifts?

M. COMMUNICATIONS

1. Is your communication system adequately sized and designed to allow effective communications with auxiliary operators, maintenance people, etc.?

2. Is your communications gear properly integrated into the control room?

3. Are there situations where the lack of proper communications caused operational problems?

N. OPERATIONAL PRACTICES

1. Are your watch turnover practices systematic and designed to ensure the proper transfer of information between outgoing and oncoming crews? Is there enough overlap?

2. What problems are caused by shift rotation?

3. How much of an impact does shift work have on operator efficiency, home life, social life, and attitudes towards the job? Have permanent or long-term shifts been considered?

4. How much overtime did you work in the past year? Is this excessive?

5. Is your job structured to avoid long periods of monotonous and/or confining working conditions across all shifts? How could the operator's job be made more interesting and productive?

6. Is there a clear-cut chain of command in your control room during an emergency?

7. How would you describe communication channels between the operators and plant management?

8. How effective are your clearance and tagging procedures? Can they be improved? Do maintenance tags interfere with the normal or emergency operation of the plant?

O. PROTECTIVE EQUIPMENT

1. Please describe the quantity and location of operator protective equipment in the control room.

2. Have you had any practice in conducting control room operations while wearing protective equipment?

3. Do the face masks interfere with visibility of displays?

4. Do you have any communications problems while wearing protective gear?

5. Do you feel confident that you can conduct all necessary operational tasks while wearing protective equipment?

P. TRAINING - SELECTION

1. In retrospect, how well did your training program prepare you for your job? What changes, if any are needed in operator training programs?

2. How important is simulator training in preparing an operator for his job? How could simulator training programs be improved?

3. How effective is your requalification training program? Are any improvements needed?

4. How well qualified are licensed management personnel to operate the control room?

5. How good a job does your utility do in selecting candidates for operator training?

CRITICAL INCIDENTS

Based on your operational experience, cite some examples of incidents with serious or potentially serious consequences. Describe the specifics of the case. Please only describe incidents you have witnessed directly.

Based on your operating experience, cite some examples of a particular control, display, panel, warning device, procedure, etc., that could lead to a malfunction or operator error.

Have I neglected to ask you any questions that relate to operator performance in your control room?

CHECKLIST DATA COLLECTION FORMS
AND HED RATING FORM

COMPONENT TYPE: cont. rotary control
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
Stops should be provided at the limits of the control range.	6.4.4.5.b(4)				
Direction of motion should be identified.	6.6.3.8.b				
Control movements should conform to accepted movement conventions (open=right, close=left, etc.).	6.4.2.1				
Control should have moving pointer and fixed positions.	6.4.4.5.c				
Position indication should include an engraved line on top of the control and down the side, or a pointer.	6.4.4.4.b				
Knobs for different function types should be distinguishable by sight and touch.	6.4.2.2.e				
Knobs for continuous adjustment should be round with a textured surface.	6.4.4.4.a				
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Labels should be brief.	6.5.1.4.c				
Label should be visible during control actuation.	6.6.2.4.c				

COMPONENT TYPE: cont. rotary control
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Words or abbreviations which appear similar should not be used where confusion may result.	6.6.3.6				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
STATUS LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				

COMPONENT TYPE: cont. rotary control
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.c(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				

COMPONENT TYPE: controller
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
CONTROLLLERS					
All discrete functional control positions should be identified	6.6.3.8.a				
All discrete functional control positions should be provided with detents.	6.4.4.5.b(1)				
It should not be possible to position a control between detented positions.	6.4.4.5.b(2)				
24 or fewer positions should be used.	6.4.4.5.b(3)				
Stops should be provided at the limits of the control range.	6.4.4.5.b(4)				
Direction of motion should be identified.	6.6.3.8.b				
Control movements should conform to accepted movement conventions (open=right, close=left, etc.).	6.4.2.1				
Control should have moving pointer and fixed positions.	6.4.4.5.c				
Position indication should include an engraved line on top of the control and down the side, or a pointer.	6.4.4.5.d(1)				
Knobs for continuous adjustment should be round with a textured surface.	6.4.4.4.a				
POINTERS					
Pointer shape should be simple.	6.5.2.2.a(1)				
Moving scale indicators are not used.	6.5.2.5.				
Pointer should be mounted to avoid parallax error.	6.5.2.2.b(2)				
Pointer size and contrast should allow rapid pointer recognition.	6.5.2.2.c				

COMPONENT TYPE: controller
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
METER GRADUATIONS					
Use nine or fewer graduations between numerals.	6.5.1.5.a(1)				
Separate four or fewer marks with minor and major graduations.	6.5.1.5.a(2)				
Add intermediate graduations if five or more graduations between numerals.	6.5.1.5.a(3)				
Numerals on graduations should be vertical.	6.5.2.4.a				
Indicated values should progress by 1, 5, or 10, or 2 (less desirable), or those numbers multiplied by 10.	6.5.1.5.c				
Scale values should increase to the right, upward, or clockwise.	6.5.2.1				
If values are transformed, the transformation should be clearly marked.	6.5.1.2.e				
LABELS					
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				

COMPONENT TYPE: digital displays
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Numbers should read horizontally from left to right.	6.5.5.1.a(1)				
If more than four digits, groups should be separated.	6.5.5.1.a(3)				
Display should have high contrast.	6.5.5.1.a(4)				
Display finish should minimize glare.	6.5.5.1.a(5)				
DRUM COUNTERS					
Counter should be mounted perpendicular to operator's line of sight.	6.5.5.1.b(1)				
Counter should be mounted to minimize shadows and maximize viewing angles.	6.5.5.1.b(2)				
The window should allow only one digit per drum to appear at any time.	6.5.5.1.b(3)				
Numbers should change by snap action rather than continuous movement.	6.5.5.1.c(1)				
Counter drums should move upward with increasing values.	6.5.5.1.c(2)				
ELECTRONIC COUNTERS					
Character to background contrast ratio should be between 15:1 and 20:1.	6.5.5.2.c				
LABELS					
Component labels should clearly identify each display.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				

COMPONENT TYPE: digital displays
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

COMPONENT TYPE: indicator light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Demand and status information should be identified as such.	6.5.1.1.e				
Display failure should be apparent.	6.5.1.1.f				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.C(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				

COMPONENT TYPE: indicator light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				

COMPONENT TYPE: indicator light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.e				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

COMPONENT TYPE: J-handle or T-handle
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
All discrete functional control positions should be identified.	6.6.3.8.a				
All discrete functional control positions should be provided with detents.	6.4.4.5.b(1)				
It should not be possible to position a control between detented positions.	6.4.4.5.b(2)				
24 or fewer positions should be used.	6.4.4.5.b(3)				
Stops should be provided at the limits of the control range.	6.4.4.5.b(4)				
Control movements should conform to accepted movement conventions (open=right, close=left, etc.).	6.4.2.1				
Control position information should be visible to the operator during control manipulation.	6.6.3.8.c				
It should not be possible to confuse controller position relative to position markers.	6.4.4.5.d(2)				
Position indication should include an engraved line on top of the control and down the side, or a pointer.	6.4.4.5.d(1)				
An engraved line should be filled with contrasting pigment.	6.4.4.4.b				
INDICATOR LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				

COMPONENT TYPE: J-handle or T-handle
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.c(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				
LABELS					
Component labels should clearly identify each element.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				

COMPONENT TYPE: J-handle or T-handle

PANEL:

REVIEWER:

DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Label should be visible during control actuation.	6.6.2.4.c				
Labels should have all simple capital letters.	6.6.4.2.a				
Words and abbreviations which appear similar should be avoided where confusion may result.	6.6.3.6				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should be brief.	6.5.1.4.c				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels should not obscure prior permanent labels.	6.6.5.1.c				

COMPONENT TYPE: key operated controls
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Key operated controls should be used only where required by safety.	6.4.4.3.a				
Rotary selector controls should be used when three or more detented positions are required	6.4.4.5.a				
All discrete functional control positions should be identified.	6.6.3.8.a				
All discrete functional control positions should be provided with detents.	6.4.4.5.b(1)				
It should not be possible to position a control between detented positions.	6.4.4.5.b(2)				
24 or fewer positions should be used.	6.4.4.5.b(3)				
Stops should be provided at the limits of the control range.	6.4.4.5.b(4)				
Control movements should conform to accepted movement conventions (open=right, close=left, etc.).	6.4.2.1				
Switch should be OFF when key is in vertical position.	6.4.4.3.d				
STATUS LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.c(2)				

COMPONENT TYPE: key operated controls
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Visual displays should contain black markings on white backgrounds.	6.5.1.3.c				
Labels should be oriented horizontally.	6.6.2.3.a				

COMPONENT TYPE: key operated controls
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				

COMPONENT TYPE: legend pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
Pushbuttons should be easily dinstinguishable from legend indicators.	6.5.3.3.c				
Legend covers should be keyed or procedures employed to prevent cover interchange.	6.4.3.3.c(4)				
Safe, convenient power-on replacement from the front should be provided.	6.4.3.3.c(2)				
Pushbuttons should not short out during lamp replacement.	6.4.3.3.c(3)				
Barriers should be used when legend pushbuttons are contiguous.	6.4.3.3.d(1)				
Barriers should have rounded edges.	6.4.3.3.d(2)				
STATUS LIGHTS					
Demand and status indicators should be easily distinguishable.	6.5.1.1.e				
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.C(2)				
Colors should conform to code established for control room.	6.5.3.3.d				

COMPONENT TYPE: legend pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Illuminated indicator should be at least 10% brighter than surrounding panel.	6.5.3.2.b				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
LEGEND INDICATORS					
Legend should be legible with light out.	6.5.3.3.a(2)				
There should be good contrast with or without illumination	6.5.3.3.a(3)				
Legend should be well designed.	6.5.3.3.b				
Lettering should be simple.	6.5.3.3.b(2)				
There should be no more than three lines per legend.	6.5.3.3.b(5)				
Abbreviations should be standard.	6.5.3.3.b(6)				
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				

COMPONENT TYPE: legend pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

COMPONENT TYPE: legend status light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
Legend status lights should be readily distinguishable from legend pushbuttons.	6.5.3.3.c				
Visual displays should normally be black markings on white background.	6.5.1.3.c				
Legend covers should be keyed or procedures employed to prevent cover interchange.	6.4.3.3.c(4)				
Safe, convenient power-on replacement from the front should be provided.	6.4.3.3.c(2)				
Dual bulbs or filaments should be used, or lamp test capability should be provided.	6.4.3.3.c(1)				
Demand and status information should be easily distinguishable.	6.5.1.1.e				
Display failures should be apparent.	6.5.1.1.f				
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.c(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel.	6.5.3.2.b				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				

COMPONENT TYPE: legend status light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
LEGEND INDICATORS					
Legend should be legible with light out.	6.5.3.3.a(2)				
There should be good contrast with or without illumination	6.5.3.3.a(3)				
Legend should be well designed.	6.5.3.3.b				
Lettering should be simple.	6.5.3.3.b(2)				
There should be no more than three lines per legend.	6.5.3.3.b(5)				
Abbreviations should be standard.	6.5.3.3.b(6)				
Words or abbreviations of similar appearance should be avoided where an error in interpretation could result.	6.6.3.e				
LABELS					
Component labels should clearly identify each element.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				

COMPONENT TYPE: legend status light
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

COMPONENT TYPE: meter
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
Status and demand information should be identified as such.	6.5.1.1.e				
Instrument failure should be made apparent.	6.5.1.1.f				
Values should not require operator conversion.	6.5.1.2.b				
When two or more displays of the same parameter must be compared, scales should be compatible in progression and scale organization.	6.5.1.5.d				
Multiscale indicators should be avoided.	6.5.1.5.f				
Multirange meters are marked or color coded to differentiate among ranges.	NUTAC G-33				
Zone markings should show normal, marginal, and out of tolerance positions.	6.5.2.3.a				
Zone markings should not interfere with quantitative markings.	6.5.2.3.b				
Colors should conform to color code standards, especially red, green, and amber.	6.5.2.3.c				
GRADUATIONS					
Use nine or fewer graduations between numerals.	6.5.1.5.a(1)				
Major and minor graduations should be used if there are up to four graduations between numerals.	6.5.1.5.a(2)				

COMPONENT TYPE: meter
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Messages should avoid extraneous information.	6.5.1.4.b				
Messages on the display face should be clearly worded and brief.	6.5.1.4.c				
Words or abbreviations of similar appearance should be avoided where an error in interpretation could result.	6.6.3.e				
Messages should describe units on the display and may include engineering characteristics.	6.5.1.4.a				
LABELS					
Component labels should clearly identify each meter.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Visual displays should contain black markings on white backgrounds.	6.5.1.3.c				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				

COMPONENT TYPE: meter
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels should not obscure prior permanent labels.	6.6.5.1.c				
POINTERS					
Pointer shape should be simple.	6.5.2.2.a(1)				
Pointer tip should extend to but not overlap graduations.	6.5.2.2.b(1)				
Moving scale indicators are not used.	6.5.2.5.				
Pointer should be mounted to avoid parallax error.	6.5.2.2.b(2)				
Pointer size and contrast should allow rapid pointer recognition.	6.5.2.2.c				

COMPONENT TYPE: recorder
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
VISIBILITY					
Graphic recorders should provide clear, distinct, and reliable markings using pens, ink, and paper of appropriate quality.	6.5.4.1.a				
Recorders should provide easy viewing angles for channel identification.	6.5.4.2.b(2)				
All data should be visible through the recorder window.	6.5.4.1.k				
It should be easy to annotate recordings.	6.5.4.1.j				
Printing mechanisms should provide clear, sharp, and small numbering on discrete recorders.	6.5.4.2.b(3)				
CHANNEL IDENTIFICATION					
Channel identification should be provided by different inks for each pen. Colors should be easily identifi-able and afford good contrast.	6.5.4.2.a(2)				
Recorders should display any single channel immediately on demand.	6.5.4.2.b(4)				
Recorder should not exceed designed channel capacity.	6.5.4.2.b(1)				
MATERIALS					
Operator maintained expendables should be accessible in the control room.	6.5.4.1.e				
Paper and ink should be easily replaced.	6.5.4.1.(f)				
Scales on paper and recorder should match.	6.5.4.1.b				

COMPONENT TYPE: recorder
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Paper speed should be adjustable to change time scale.	6.5.4.1.i				
Take-up spool should be provided.	6.5.4.1.d				
GRADUATIONS					
Use nine or fewer graduations between numerals.	6.5.1.5.a(1)				
Major and minor graduations should be used if there are up to four graduations between numerals.	6.5.1.5.a(2)				
Add intermediate graduations if five or more graduations between numerals.	6.5.1.5.a(3)				
Numerals on graduations should be vertical.	6.5.2.4.a				
Indicated values should progress by 1, 5, or 10, or 2 (less desirable), or those numbers multiplied by 10.	6.5.1.5.c				
Scale values should increase to the right, upward, or clockwise.	6.5.2.1				
If values are transformed, the transformation should be clearly marked.	6.5.1.2.e				
MESSAGES and LEGENDS					
Messages on the display face should be horizontal.	6.5.2.4.a				
Messages should avoid extraneous information.	6.5.1.4.b				
Messages on the display face should be clearly worded and brief.	6.5.1.4.c				

COMPONENT TYPE: recorder
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): _______ _______

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Messages on the display face should be consistent, using the same words, acronyms, abbreviations, etc.	6.5.1.4.e				
Words or abbreviations of similar appearance should be avoided where an error in interpretation could result.	6.6.3.c				
Messages should describe units on the display and may include engineering characteristics.	6.5.1.4.a				
LABELS					
Component labels should clearly identify each recorder.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				

COMPONENT TYPE: recorder
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Labels should have all simple capital letters.	6.6.4.2.a				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels should not obscure prior permanent labels.	6.6.5.1.c				

COMPONENT TYPE: rotary selectors
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
ROTARY SELECTORS					
Rotary selector controls should be used when three or more detented positions are required	6.4.4.5.a				
All discrete functional control positions should be identified	6.6.3.8.a				
All discrete functional control positions should be provided with detents.	6.4.4.5.b(1)				
It should not be possible to position a control between detented positions.	6.4.4.5.b(2)				
24 or fewer positions should be used.	6.4.4.5.b(3)				
Stops should be provided at the limits of the control range.	6.4.4.5.b(4)				
Control movements should conform to accepted movement conventions (open=right, close=left, etc.).	6.4.2.1				
Control should have moving pointer and fixed positions.	6.4.4.5.c				
Position indication should include an engraved line on top of the control and down the side, or a pointer.	6.4.4.5.d(1)				
Controls should be visually and tactually identifiable.	6.4.4.1.c				
LABELS					
Component labels should clearly identify each element.	6.6.1.2.a(3)				

COMPONENT TYPE: meter
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S):

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Add intermediate graduations if five or more graduations between numerals.	6.5.1.5.a(3)				
Numerals on graduations should be vertical.	6.5.2.4.a				
Indicated values should progress by 1, 5, or 10, or 2 (less desirable), or those numbers multiplied by 10.	6.5.1.5.c				
Scale values should increase to the right, upward, or clockwise.	6.5.2.1				
If values are transformed, the transformation should be clearly marked. (For example, X10, X1000, etc.)	6.5.1.2.e				
Where pointer movement exceeds 360 degrees, or where both positive and negative values are shown, the zero should be located at the 12 o'clock position (round meters only).	6.5.2.4.b				
Where scale covers less than full pointer rotation, scale end points should be indicated by a scale break.	6.5.2.4.c(1)				
The break should be at least one numbered interval in length.	6.5.2.4.c(2)				
The break should be at the six o'clock position.	6.5.2.4.c(3)				
Logarithmic scales should be avoided unless displaying a very large range.	6.5.1.5.e				
MESSAGES and LEGENDS					
Messages on the meter face should be horizontal.	6.5.2.4.a				

COMPONENT TYPE: rotary selectors
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Visual displays should contain black markings on white backgrounds.	6.5.1.3.c				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Words or abbreviations of similar should be avoided where confusion may result.	6.6.3.6				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels should not obscure prior permanent labels.	6.6.5.1.c				

COMPONENT TYPE: rotary selectors
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
STATUS LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.c(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				

COMPONENT TYPE: round pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Pushbuttons should be located and oriented to prevent accidental activation.	6.4.1.2.a				
Pushbuttons may be recessed, shielded, or otherwise surrounded but contained within physical barriers.	6.4.1.2.b				
Barriers should have rounded edges.	6.4.3.3.d(2)				
STATUS LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.C(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel (50% preferred).	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				

COMPONENT TYPE: round pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				

COMPONENT TYPE: round pushbutton
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

COMPONENT TYPE: switches
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
GENERAL					
Discrete functional positions should be clearly identified.	6.4.4.3.f				
Control movements should conform to accepted movement conventions	6.4.2.1				
Audible and/or tactile feedback should confirm switch activation.	6.4.5.3.b				
SLIDE SWITCHES					
The surface of a slide switch should be serrated or knurled.	6.4.5.2.a				
ROCKER SWITCHES					
Rocker switches should primarily be oriented vertically.	6.4.5.4.a				
UP should correspond to ON or INCREASE.	6.4.5.4.a(1)				
Horizontal activation should be used only when necessitated by the location of controlled function or equipment.	6.4.5.4.a(2)				
In the ON position, the top of the switch should be flush with the panel surface.	6.4.5.4.b(2)				
If it controls a critical function, channel guards or some other mechanism should be used to prevent accidental activation.	6.4.5.4.d				
STATUS LIGHTS					
System status should be inferred by illumination, not its absence.	6.5.3.1.c(1)				
Indicators should not be used to alert operators. (Annunciators should be.)	6.5.3.1.d				

COMPONENT TYPE: switches
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Colors should be easily identified.	6.5.3.2.a(3)				
Red, green, and amber should be reserved for purposes with immediate safety implications.	6.5.1.6.C(2)				
Colors should conform to code established for control room.	6.5.3.3.d				
Illuminated indicator should be at least 10% brighter than surrounding panel.	6.5.3.2.b				
Nearby labelling should be used where meaning is not apparent.	6.5.3.2.a(1)				
Ambient light source effects should not cause misreadings.	6.5.3.1.b				
Interchange of lenses should be prevented by design or procedure.	6.5.3.1.c(2)				
Safe, convenient power-on replacement should be provided.	6.5.3.1.a(3)				
Dual bulbs or filaments should be used.	6.5.3.1.a(1)				
LEGEND INDICATORS					
Legend should be legible with light out.	6.5.3.3.a(2)				
Indicator should be easily distinguishable from legend pushbuttons.	6.5.3.3.c				
There should be good contrast with or without illumination	6.5.3.3.a(3)				
Legend should be well designed.	6.5.3.3.b				
Lettering should be simple.	6.5.3.3.b(2)				

COMPONENT TYPE: switches
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): ------- -------
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GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
There should be no more than three lines per legend.	6.5.3.3.b(5)				
Abbreviations should be standard.	6.5.3.3.b(6)				
LABELS					
Component labels should clearly identify each control.	6.6.1.2.a(3)				
Labels do not repeat information.	6.6.1.2.a(4)				
Labels have consistent type style.	6.5.1.3.b(2)				
Labels are spelled correctly.	6.6.3.2.f				
Labels should be mounted to prevent accidental removal.	6.6.2.2.a				
Abbreviations should be standard.	6.5.1.4.d				
Labels should be oriented horizontally.	6.6.2.3.a				
Curved labels should be avoided.	6.6.2.3.b				
Labels should not cover any other information source.	6.6.2.4.a				
Labels should not be obscured.	6.6.2.4.b				
Unusual technical terms should be avoided.	6.6.3.2.e				
Symbols should be unique and easily distinguishable.	6.6.3.4.b				
Roman numerals should be avoided.	6.6.3.4.e				
Labels should have all simple capital letters.	6.6.4.2.a				
Labels should be brief.	6.5.1.4.c				

COMPONENT TYPE: switches
PANEL:
REVIEWER:
DATE:

COMPONENT ID NUMBER(S): _______ _______
_______ _______
_______ _______ _______ _______ _______
_______ _______ _______ _______ _______
_______ _______ _______ _______ _______

GUIDELINE	NUREG 0700 REFERENCE	YES	NO	DNA	NOTES
Label should be visible during actuation.	6.6.2.4.c				
Words or abbreviations with similar appearances should not be used where confusion may result.	6.6.3.6				
Temporary labels should conform to good human engineering principles.	6.6.5.1.b				
Temporary labels do not obscure relevant permanent labels.	6.6.5.1.c				

HUMAN ENGINEERING DISCREPANCY RECORD

DATA SOURCE

___ OPER. EXP. REVIEW
___ INTERVIEW
___ CHECKLIST
___ SURVEY
___ VALIDATION

HED IDENTIFICATION

CODE NO. ______________
PHOTO I.D. NO. ______________
DATE ______________
REVIEWER ______________

TOPIC IDENTIFICATION

HED TOPIC ITEM ______________
____
NUREG-0700 GUIDELINE REF. ______________
____

EQUIPMENT IDENTIFICATION

COMPONENT NAME ______________

SUBSYSTEM / COMPONENT I.D. NO.

HED DESCRIPTION

RELATED EVENT/FUNCTION/TASK:

SAFETY CONSEQUENCES:

INTERACTION WITH OTHER HED'S, SYSTEMS, EVENTS, FUNCTIONS, TASKS:

POTENTIAL CORRECTIONS

ACTIONS TO CORRECT HED:

CORRECTION SCHEDULE:

COMMENTS

T60526

HED RATING FORM

RATER: COMPONENT ID: HED CODE:
DATE:

ITEM	RATING SCORE	
DOCUMENTED EVENT/CONDITION		
1-1 Documented Event (Source:________________)	____________	(NA, N, Y)
1-2 Interview Reported Condition (Source:________________)	____________	(NA, N, Y)
OPERATOR PERFORMANCE		
2-1 Fatigue	____________	(NA, N, 1, 2)
2-2 Discomfort	____________	(NA, N, 1, 2)
2-3 Stress	____________	(NA, N, 1, 2)
2-4 Distraction	____________	(NA, N, 1, 2)
2-5 Communication difficulties	____________	(NA, N, 1, 2)
2-6 Physical difficulty of control operation	____________	(NA, N, 1, 2)
2-7 Misidentification	____________	(NA, N, 1, 2)
2-8 Misreading or misadjusting		
2-9 Mental overload	____________	(NA, N, 1, 2)
2-10 Sequential errors	____________	(NA, N, 1, 2)
2-11 Delay or absence of feedback	____________	(NA, N, 1, 2)
2-12 Excessive concurrnet task demands	____________	(NA, N, 1, 2)
SAFETY CONSEQUENCES		
3-1 Emergency Classification	____________	(NA, N, Y)
3-2 Safety Impact	____________	(NA, N, 1, 2)
3-3 Plant Integrity	____________	(NA, N, 1, 2)
3-4 EOP Function	____________	(NA, N, Y)
PLANT OPERATING CONDITIONS		
4-1 Plant Equipment	____________	(NA, N, 1, 2)
4-2 Tech Spec	____________	(NA, N, 1, 2)
4-3 Plant Availability	____________	(NA, N, 1, 2)
4-4 Personnel Safety	____________	(NA, N, 1, 2)

APPENDIX C
SAMPLE TASK ANALYSIS AND VERIFICATION DATA SHEETS

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	T Y P E	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT P#	INSTR. NO.
Entry conditions:										
			EC.1							
RPV water level below [+12 in. (low level scram setpoint)].	RPV water level below +9 in.	Plant specs	o Monitor RPV level < +9 in.							
			Alarm							
			- Rx Lo Level Scram	A	IN.	+9			C05	C05-B-19
			Indicators							
			- Rx Vessel Level	T	IN.	+9			C05	LI 6-94A
									C05	LI 6-94B
									C05	LI 2-3-35A
									C05	LI 2-3-65A
			- Rx Vessel Level recorder	T	IN.	+9			C05	FLR 6-96
			EC.2							
RPV pressure above [1045 psig (high RPV pressure scram set-point).	RPV pressure above 1056 psig.	Plant specs	o Monitor RPV pressure > 1056 psig							
			Alarm							
			- Rx Hi Press Scram	A	PSIG	1056			C05	C05-B-11

EOP TASK ANALYSIS, REV.2 C.5-1100, REV. D, RPV Control

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	TYPE	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT P#	INSTR. NO.
Entry conditions:										
			EC.1							
RPV water level below [+12 in. (low level scram setpoint)].	RPV water level below +9 in.	Plant specs	o Monitor RPV level < +9 in.							
			Alarm							
			- Rx Lo Level Scram	A	IN.	+9			C05	C05-B-19
			Indicators							
			- Rx Vessel Level	T	IN.	+9			C05	LI 6-94A
									C05	LI 6-94B
									C05	LI 2-3-85A
									C05	LI 2-3-85A
			- Rx Vessel Level recorder	T	IN.	+9			C05	FLR 6-96
			EC.2							
RPV pressure above [1045 psig (high RPV pressure scram set- point).	RPV pressure above 1056 psig.	Plant specs	o Monitor RPV pressure > 1056 psig							
			Alarm							
			- Rx Hi Press Scram	A	PSIG	1056			C05	C05-B-11
			Indicators							
			- Rx Vessel Pressure	I	PSIG	1056 +/-10			C05	PI 6-90B
									C05	PI 6-90A
			- Rx Vessel Press Recorder	T	PSIG	1056 +/-10			C05	FPR 6-97
			EC.3							
Drywell pressure above [2.0 psig (high drywell pressure scram set- point)].	Drywell pressure above 2.0 psig		o Monitor drywell pressure > 2.0 psig							
			Alarm							
			- Drywell Hi Press Scram Trip	A	PSIG	+2.0 +/-1			C05	C05-B-28
			Indicators							

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	T Y P E	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT P#	INSTR. NO.
			- Containment Pressure Recorder	T	PSIG	+2.0	+/-1		C04	PR 2994
A condition which requires MSIV isolation		Mentioned in step 2: Level Control								
A condition which requires reactor scram and reactor power above [3% (APRM down-scale trip)] or cannot be determined.	A condition which requires a reactor scram, and:		EC.4.1 Monitor parameters that initiate a reactor scram:							
			o Monitor ATWS > 1135 psig < -47 in.							
			Alarms							
			- ATWS CH A Trip	A	ATWS	TRIP			C05	C05-A-31
			- ATWS CH B Trip	A	ATWS	TRIP			C05	C05-A-32
			EC.4.2 o Monitor RPV press > 1056 psig							
			Alarms							
			- Rx Vessel Pressure	A	PSIG	1056				
			Indicators						C05	[Computer RPV press]
			- Rx Vessel Pressure	I	PSIG	1056	+/-10		C05	PI 6-90A
									C05	PI 6-90B
			- Rx Vessel Pressure recorder	T	PSIG	1056	+/-10			
			EC.4.3 o Monitor RPV water level							
			Alarms							
			- Rx Lo Level Scram	A	IN.	-47			C05	C05-B-19

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GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	TYPE	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT P#	INSTR. NO.
			Indicators							
			- Rx Vessel Level	T	IN.	-47			C05	LI 2-3-85A
									C05	LI 2-3-85B
			- Rx Vessel Level recorder	T	IN.	-47			C05	FLR 6-96
			EC.4.4							
			o Monitor Rx Power Level IRM & APRM							
			- IRM - APRM	T	% PWR	3			C05	7-46A
									C05	7-46D
			- IRM APRM/ RBM	T	% PWR	3			C05	7-46B
									C05	7-46C
			Alarm							
			- Reactor Neutron Mon Scram Trip	A	% PWR	3			C05	C05-B-03
			- APRM Power	T	% PWR	3			C37	[APRM Power meter]
			EC.4.5							
			o Monitor MS high radiation > 4000 MR/HR							
			Alarm							
			- MSL Hi Rad Scram Trip	T	MR	4000			C05	C05-B-29
			Indicators							
			- Main Steam Line Rad Monitors	T	MR	4000			C10	RI 17-251A
									C10	RI 17-251B
									C10	RI 17-251C
									C10	RI 17-251D
			- Main Steam Rad Level Recorder	T	MR	4000			C02	17-252
			EC.4.6							
			Monitor drywell pressure > 2.0 psig							

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	TYPE	P	S	R	C	P#	INSTR. NO.
			Alarm							
			- Drywell Hi Press Scram Trip	A	PSIG	+2.0	+/-1		C05	C05-B-28
			Indicators							
			- Containment Pressure	T	PSIG	+2.0	+/-1		C04	PR 2994
			EC.4.7							
			o Monitor condensor vacuum <23.5 Hg Vac							
			Alarm							
			- Condensor low vacuum	A	IN HG	23.5			C05	C05-B-20
			Indicators							
			- #11 or #12 Condensor Vacuum	T	IN HG	23.5	+/-0.5		C07	PR 1264 [Computer points]
			EC.4.8							
			o Monitor scram discharge volume							
			Alarm							
			- Disch Vol Hi Wtr Volume	A	GAL	53+/-1			C05	C05-B-21
			Indicators							
			- Scram Dishcarge Volume	T	GAL	53+/-1				
			EC.4.9							
			o Monitor ctrl valve fast closure							
			Alarm							
			- Generator Fast Closure Scram Trip	A	SCRAM				C05	C05-8-36
			Indicators							
			- 30% of 1st Stage Pressure	T	% POS	30				*
			- Control Valve Position	T	% POS	0			C07	POI 1783
									C07	POI 1784
									C07	POI 1785
									C07	POI 1786

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	TY/PE	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT P#	INSTR. NO.
			EC.4.10							
			o Monitor stop valve closure							
			Alarm							
			- Turb Stop Vlv Closure Scram Trip	A	SCRAMCLOSE				C05	C05-B-35
			Indicators							
			- 30% of 1st Stage Pressure	T	% POS	30				*
			- Control Valve Position	T	% POS	0			C07	POI 1783
									C07	POI 1784
									C07	POI 1785
									C07	POI 1786
			EC.4.11							
			o Monitor MSIV closure							
			Alarm							
			- MSL Isol Vlv Scram Trip	A	%OPEN	90			C05	C05-B-27
			Indicators							
			- MSIV Inbd Isol Valves	T	POS	CLOSE			C03	16A-DS3A
									C03	16A-DS3B
									C03	16A-DS3C
									C03	16A-DS3D
			- MSIV Inbd Isol Valves	T	POS	CLOSE			C03	16A-DS7A
									C03	16A-DS7B
									C03	16A-DS7C
									C03	16A-DS7D
			EC.5							
	a. Reactor power above 3% OR		o Monitor reactor power > 3%							
	b. Power cannot be determined.		-IRM & APRM							
			Alarm							
			- Rx Neutron Mon Scram Trip	A	% PWR	3			C05	C05-B-03

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GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	T: INFO & CONTROL NEEDS: Y: (PAR,STPNT,RSL,CTRL) P: .E	P	S	R	C	P#	AVAILABLE COMPONENT INSTR. NO.
			Indicators - IRM - APRM	T	% PWR	3			C05	7-46A
									C05	7-46D
			- IRM APRM/ RBM	T	% PWR	3			C05	7-46B
									C05	7-46C
If reactor scram has not been initiated, initiate reactor scram.	1) If reactor scram has not been initiated, then manually scram the reactor.		P.1.1 o Monitor Auto Scram Alarm							
			- Channel A	A		SCRAM			C05	C05-8-04
			- Channel B	A		SCRAM			C05	C05-8-05
			o Check scram condition -Rod positions fully inserted	T	POS	"00"			C05	RPIS Full Core Disp [Computer CR pos]
			P.1.2 If fully inserted, o Manually scram reactor							
			Depress Manual Scram P.B.s - Manual Rx Scram	C	POS	ON		DM	C05	5A-S3A
								DM	C05	5A-S3B
			Indicator - Rx Manual Scram	T	SCRAM				C05	C05-8-12
									C05	C05-8-13
			Place Rx Mode Switch in SHUTDOWN - Rx Mode Select	C	MODE	SHTDWN		DM	C05	5A-S1
			Verify CRs are fully inserted	I	POS	"00"			C05	RPIS Full Core Disp
			Place Rx Mode Switch in REFUEL							

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	T Y P E	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P	S	R	C	AVAILABLE COMPONENT PN	INSTR. NO.
			- Rx Mode Select	C	MODE	REFUEL		DM	C05	5A-S1
			Check Refuel Mode Rod Out Permissive Light	I	PERM	ON			C05	[Permissive]
			Verify all scram valves OPEN	I	POS	OPEN			C05	RPIS Full Core Disp
			Verify all RPS Group Bus (Scram solenoids are de-energized.)	I	SOL	OFF			C05	DS1A
									C05	DS1B
									C05	DS1C
									C05	DS1D
									C05	DS1E
									C05	DS1F
									C05	DS1G
									C05	DS1H
			Verify air pressure on header is "0"							
			Alarm	A	PSIG	0				*
			Indicator	I	PSIG	0				*
			o Monitor Rx Power Level IRM & APRM							
			- IRM - APRM	I	% PWR				C05	7-46A
									C05	7-46D
			- IRM APRM/ RBM	I	% PWR				C05	7-46B
									C05	7-46C
			- Reactor Neutron Mon Scram Trip	A	SCRAM				C05	C05-B-03
			- APRM Power	I	% PWR	3			C37	[APRM Power meter]

GENERIC EPG GUIDELINE	MONTI EOP INSTRUCTION	COMMENTS	OPERATOR ACTIONS	TYPE	INFO & CONTROL NEEDS (PAR,STPNT,RSL,CTRL) P S R C	AVAILABLE COMPONENT P# INSTR. NO.
	2) Proceed to C.5-: o 1101 (RPV Level Control) o 1102 (RPV Pressure Control) o 1103 (RPV Power Control) AND execute them concurrently.					

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TASK ANALYSIS INSTRUMENTATION LISTING

EQUIP FUNCTION	T	PARA	VALUE	CNTRL	PANEL	INSTRUMENT NO.	PARAMETER	VALUE	RESOL	M DIV	HED
** C.5-1100 EC.01											
RX LO LEVEL SCRAM	A	IN.	+9		C05	C05-B-19	IN	+ 9			
REACTOR VESSEL LVL/TOTAL FW FLOW	T	IN.	+9		C05	FLR 6-96	LB/HR:IN	0-8:#/HR x 10^6,0-60:IN. H20	1/2 % FS		T-23
RPS LEVEL	T	IN.	+9		C05	LI 2-3-85A	IN.	(-50) - 50	2 % FS	--	
RPS LEVEL	T	IN.	+9		C05	LI 2-3-85B	IN.	(-50) - 50	2 % FS	--	
REACTOR VESSEL LEVEL	T	IN.	+9		C05	LI 6-94A	IN.	0 - 60	2 % FS	1	T-07 T-23
REACTOR VESSEL LEVEL	T	IN.	+9		C05	LI 6-94B	IN.	0 - 60	2 % FS	1	T-07 T-23
** C.5-1100 EC.02											
RX HI PRESS SCRAM	A	PSIG	1056		C05	C05-B-11	PSIG	1056			
REACTOR VESSEL PRESS./STEAM FLOW	T	PSIG	1056		C05	FPR 6-97	LB/HR:PSIG	0-8:#/HR x 10^6,0-1200:PSIG	1/2 % FS		T-12
REACTOR PRESS A	T	PSIG	1056		C05	PI 6-90A	PSIG X 100	0 - 12	2 % FS	0.2	T-12
REACTOR PRESS B	T	PSIG	1056		C05	PI 6-90B	PSIG X 100	0 - 12	2 % FS	0.2	T-12
** C.5-1100 EC.03											
CONTAINMENT PRESSURE	T	PSIG	+2.0		C04	PR 2994	PSIG	(-2)-3:PSIG 0-80:PSIG (-2)-3:PSI	1/2 % FS	5/.25	
DRYWELL HI PRESS SCRAM TRIP	A	PSIG	+2.0		C05	C05-B-28	PSIG	2			
** C.5-1100 EC.04.01											
ATWS CH A TRIP	A	ATWS	TRIP		C05	C05-A-31	ATWS	TRIP			
ATWS CH B TRIP	A	ATWS	TRIP		C05	C05-A-32	ATWS	TRIP			
** C.5-1100 EC.04.02											
RX VESSEL PRESSURE	A	PSIG	1056		C05	C05-B-11	PSIG	1056			
RX VESSEL PRESS/STEAM FLOW	T	PSIG	1056		C05	FPR 6-97	LB/HR:PSIG	0-8:#/HR x 10^6,0-1200:PSIG	1/2 % FS		T-12
REACTOR PRESS A	T	PSIG	1056		C05	PI 6-90A	PSIG X 100	0 - 12	2 % FS	0.2	T-12
REACTOR PRESS B	T	PSIG	1056		C05	PI 6-90B	PSIG X 100	0 - 12	2 % FS	0.2	T-12
RPV PRESS	T	PSIG	1056		C05	[Computer RPV press]	PSIG	?			
** C.5-1100 EC.04.03											
REACTOR VESSEL L/L WTR LEVEL CH	A	IN.	-47		C05	C05-A-09	IN	6'5" ABOVE ACTIVE FUEL \(-47")			
RX VESSEL L/L LEVEL CHANNEL B	A	IN	-47		C05	C05-A-10	IN	6'5" ABOVE ACTIVE FUEL \(-47")			
RX VESSEL LVL/TOTAL FW FLOW	T	IN.	-47		C05	FLR 6-96	LB/HR:IN	0-8:#/HR x 10^6,0-60:IN. H20	1/2 % FS		
RPS LEVEL	T	IN.	-47		C05	LI 2-3-85A	IN.	(-50) - 50	2 % FS	--	T-24
RPS LEVEL	T	IN.	-47		C05	LI 2-3-85B	IN.	(-50) - 50	2 % FS	--	T-24
** C.5-1100 EC.04.04											
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46A	% POWER	0-125: 0-40: 0-125:	2 % PWR		T-12 T-20
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46B	% POWER	0-125: 0-40: 0-125:	2 % PWR		T-12 T-20
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46C	% POWER	0-125: 0-40: 0-125:	2 % PWR		T-12 T-20

TASK ANALYSIS INSTRUMENTATION LISTING

EQUIP FUNCTION	T	PARA	VALUE	CNTRL	PANEL	INSTRUMENT NO.	PARAMETER	VALUE	RESOL	M DIV	HED
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46D	% POWER	0-125: 0-40: 0-125:	2 % PWR		T-12 T-20
REACTOR NEUTRON MONITOR SCRAM TR	A	% PWR	3		C05	C05-B-03	LOW POWER	SCRAM			
APRM POWER INDICATION	T	% PWR	3		C37	[APRM Power meter]	% PWR	0 - 120	2 % PWR		T-12 T-27
** C.5-1100 EC.04.05											
DISCHARGE CANAL MONITOR	T	MR/HR	4000		C02	NR 17-252	UNITS	1-10^6:A-C UNITS 1-10^6:B-D UNIT	30 % PT		T-12
MAIN STEAM LINE RAD	T	MR/HR	4000		C10	17-251A	MR/HR	0 - 10^6	30 % PT	--	
MAIN STEAM LINE RAD	T	MR/HR	4000		C10	17-251B	MR/HR	0 - 10^6	30 % PT	--	
MAIN STEAM LINE RAD	T	MR/HR	4000		C10	17-251C	MR/HR	0 - 10^6	30 % PT	--	
MAIN STEAM LINE RAD	T	MR/HR	4000		C10	17-251D	MR/HR	0 - 10^6	30 % PT	--	
MAIN STEAM LINE HI RAD SCRAM TRI	A	MR/HR	4000		C05	C05-B-29	R/HR	4			
** C.5-1100 EC.04.06											
DRYWELL & SUPPR CHBR PRESS	T	PSIG	+2.0		C04	PR 2994	PSIG	(-2)-3:PSIG 0-80:PSIG (-2)-3:PSI	1/2 % FS	5/.25	
DRYWELL HI PRESS SCRAM TRIP	A	PSIG	+2.0		C05	C05-B-28	PSIG	2			
** C.5-1100 EC.04.07											
CONDENSER LO VACUUM SCRAM TRIP	A	IN HG	23.5		C05	C05-B-20	IN HG	23.5			
CONDENSOR VACUUM	T	IN HG	23.5		C05	[Computer Pts]					T-10
CONDENSER VACUUM	T	IN HG	23.5		C07	PR 1264	IN HG ABS	0-30:IN. HG ABS 0-6:IN. HG ABS 0	1/2 % FS		T-13
** C.5-1100 EC.04.08											
SCRAM DISCHARGE VOLUME LEVEL	I	GAL	53+/-1			*					T-10
DISCHARGE VOLUME HI WATER VOLUME	A	GAL	53+/-1		C05	C05-B-21	GAL	53			
** C.5-1100 EC.04.09											
30% OF 1ST STAGE PRESSURE	A	% POS	30			*					T-10
GENERATOR FAST CLOSURE SCRAM TRI	A	POS	FAST CLOSE		C05	C05-B-36	GEN F CLOSE	SCRAM TRIP			T-01
CONTROL VALVE #1 POSITION	T	% POS	0		C07	POI 1783	%	0 - 100	2 % FS	2	
CONTROL VALVE #2 POSITION	T	% POS	0		C07	POI 1784	%	0 - 100	2 % FS	2	
CONTROL VALVE #3 POSITION	T	% POS	0		C07	POI 1785	%	0 - 100	2 % FS	2	
CONTROL VALVE #4 POSITION	T	% POS	0		C07	POI 1786	%	0 - 100	2 % FS	2	
** C.5-1100 EC.04.10											
TURBINE STOP VALVE CLOSURE SCRAM	A	% POS	0		C05	C05-B-35	STOP VALVE	CLOSED			T-01
MAIN CONT VALVE 1 POSITION	T	% POS	0		C07	POI 1783	%	0 - 100	2 % FS	2	
MAIN CONT VALVE 2 POSITION	T	% POS	0		C07	POI 1784	%	0 - 100	2 % FS	2	
MAIN CONT VALVE 3 POSITION	T	% POS	0		C07	POI 1785	%	0 - 100	2 % FS	2	
MAIN CONT VALVE 4 POSITION	T	% POS	0		C07	POI 1786	%	0 - 100	2 % FS	2	

TASK ANALYSIS INSTRUMENTATION LISTINO

EQUIP FUNCTION	T	PARA	VALUE	CNTRL	PANEL	INSTRUMENT NO.	PARAMETER	VALUE	RESOL	M DIV HED
** C.5-1100 EC.04.11										
MSIV 2-80A	T	POS	CLOSE		C03	16A-DS3A	POS	OPEN/CLOSE		
MSIV 2-80B	T	POS	CLOSE		C03	16A-DS3B	POS	OPEN/CLOSE		
MSIV 2-80C	T	POS	CLOSE		C03	16A-DS3C	POS	OPEN/CLOSE		
MSIV 2-80D	T	POS	CLOSE		C03	16A-DS3D	POS	OPEN/CLOSE		
MSIV 2-86A	T	POS	CLOSE		C03	16A-DS7A	POS	OPEN/CLOSE		
MSIV 2-86B	T	POS	CLOSE		C03	16A-DS7B	POS	OPEN/CLOSE		
MSIV 2-86C	T	POS	CLOSE		C03	16A-DS7C	POS	OPEN/CLOSE		
MSIV 2-86D	T	POS	CLOSE		C03	16A-DS7D	POS	OPEN/CLOSE		
LINE ISOLATION VALVE SCRAM TRIP	A	POS	90 % OPEN		C05	C05-B-27	MSIV CLOSE	A&B\C&D\A&C\B&D		
** C.5-1100 EC.05										
IRM-APRM	T	% PWR	3		C05	7-46A	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
IRM APRM/RBM	T	% PWR	3		C05	7-46B	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
IRM-APRM/RBM	T	% PWR	3		C05	7-46C	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
IRM-APRM	T	% PWR	3		C05	7-46D	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
REACTOR NEUTRON MONITOR SCRAM TR	A	% PWR	3		C05	C05-B-03	LOW POWER	SCRAM		
** C.5-1100 P.01.01										
REACTOR AUTO SCRAM CHANNEL A	A	SCRAM			C05	C05-B-04	AUTO SCRAM			
REACTOR AUTO SCRAM CHANNEL B	A	SCRAM			C05	C05-B-05	AUTO SCRAM			
ROD POSITION INDICATORS	I	POS	00		C05	RPIS Full Core Disp	RPOS	0 - 48		T-11 T-18 T-16
CR POS	I	POS	00		C05	[Computer CR Pos]				
** C.5-1100 P.01.02										
HEADER AIR PRESSURE	I	PSIG	0			*				T-10
HEADER AIR PRESSURE	A	PSIG	0			*				T-10
REACTOR MODE RPS/PCIS	C	MODE	SHTDWN	DM	C05	5A-S1	POS	SHUT DOWN/REFUEL/START/RUN		T-18
RX MODE SELECT	C	MODE	REFUEL	DM	C05	5A-S1	POS	SHUT DOWN/REFUEL/START/RUN		T-18
MANUAL RX SCRAM	C	POS	ON	DM	C05	5A-S3A	POS	NA		T-21
MANUAL RX SCRAM	C	POS	ON	DM	C05	5A-S3B	POS	NA		
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46A	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46B	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46C	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
APRM LOCAL POWER LEVEL	T	% PWR	3		C05	7-46D	% POWER	0-125: 0-40: 0-125:	2 % PWR	T-12 T-20
REACTOR NEUTRON MONITOR SCRAM TR	I	PWR	LOW		C05	C05-B-03	LOW POWER	SCRAM		
REACTOR MANUAL SCRAM CHANNEL A	I	SCRAM			C05	C05-B-12	MANUAL SCRAM			
REACTOR MANUAL SCRAM CHANNEL B	I	SCRAM			C05	C05-B-13	MANUAL SCRAM			
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1A	SOL	ON		
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1B	SOL	ON		T-16

TASK ANALYSIS INSTRUMENTATION LISTING

EQUIP FUNCTION	T	PARA	VALUE	CNTRL	PANEL	INSTRUMENT NO.	PARAMETER	VALUE	RESOL	M	DIV	HED
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1C	SOL	ON				T-16
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1D	SOL	ON				T-16
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1E	SOL	ON				T-16
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1F	SOL	ON				T-16
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1G	SOL	ON				T-16
RPS SCRAM SOLENOID POWER MONITOR	I	SOL	OFF		C05	DS1H	SOL	ON				T-16
ROD POSITION INDICATORS	I	POS	00		C05	RPIS Full Core Disp	RPOS	0 - 48				T-11 T-18 T-16
ROD POSITION INDICATORS	I	POS	00		C05	RPIS Full Core Disp	RPOS	0 - 48				T-11 T-18 T-16
ROD OUT PERMISSIVE 3A-DS7	I	PERM	ON		C05	[Permissive]	POS	ON				
APRM POWER INDICATION	I	% PWR	3		C37	[APRM Power meter]	% PWR	0 - 120	2 % PWR			T-12 T-27

APPENDIX D
HUMAN ENGINEERING DISCREPANCY DESCRIPTIONS AND RESOLUTIONS FOR CONVENTION SPECIFICATION TOPICS

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A-7		6.6.3.8(a)		All discrete functional control positions should identified.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
A-11		6.4.1.1		Controls should be selected to minimize errors: 3-position toggle with only 2 functional positions.	These switches will have functional positions added. If the nonfunctional positions cannot be removed, then a caution label will be attached to the panel to inform operators of the nonfunctional position.	X						
A-27		6.6.4.1(a)		Character height should subtend a visual angle of 15 minutes of arc or more.	Monticello will enhance the control boards with new labels that comply with the control room convention specification. Some modification of the convention spec requirements may be necessary for these components to allow for space limitations.	X						
A-29		6.5.2.3(b)	METERS	Zone markings should not interfere with quantitative markings.	Monticello will modify these zone marked meters using the zone marking recommendations in the convention spec document.	X						
A-34		6.6.3.7(a)		The ATWS system should use a "A1, A2, B1, B2" for system designation instead of "A, B, C, D" to show functional relationships.	Monticello will maintain the current designation. The A1, A2, B1, and B2 designation are reserved for the Rx protection system logic designation.					X		
A-38	A	6.5.1.6(c)	METER	The unit graduations are good, hut the intermediate graduations should show each major interval (see LI 1803A).	Monticello will change the graduations.	X						
A-38	B	6.5.1.6(c)	METER	The unit graduations are good, but the intermediate graduations should show each major interval (see LI 1803A).	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
A-41		6.6.3.1(a)	PUSHBUTTON	The label should list the equipment function. The control position should list	The labels will be changed to match the convention spec for function and control labels.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				the result of actuation. It is reversed here.								
A-43		6.5.1.5(f)	RECORDER	Multiscale indicators should he avoided unless they can be justified for operational benefit, and they are not confusing.	Monticello will remove the additional unused scale on the recorder.	X						
A-44		6.9.1.1(b)		The controls should not be located so that the display is obscured during control operation.	Monticello feels that tbe existing arrangement is acceptable. No corrective actions are planned.					X		
A-50		6.4.1.1(c)	ROTARY SELECTOR	These components appear to be pushbuttons, but are rotary selectors. The operation is not recognizable and could be confusing.	These are locking pushbuttons to prevent inadvertant operation. They must be unlocked to actuate. Monticello feels that control room operators are adequately trained in the use of these controls. No corrective actions are planned.					X		
A-52	A	6.4.2.1		Control movements should conform to population stereotypes or conventional practice (TRIP should be to the "Left" of "CLOSE").	These controls will be modified to comply with tbe Monticello control room convention specification.	X						
A-52	B	6.4.2.1		Control movements should conform to population stereotypes or conventional practice (TRIP should be to the "Left" of "CLOSE").	This discrepancy has been reviewed. It has been determined that it is not a significant problem. No corrective actions are planned.					X		
A-52	C	6.4.2.1		Control movements should conform to population stereotypes or conventional practice (TRIP should be to the "Left" of "CLOSE").	These devices will be relabeled to correct this problem.	X						

A-52A	263A	HS-9000A	EFT SYSTEM MASTER SW
A-52A	8	241/CS	MAIN GENERATOR FIELD ACB
A-52B	15	16A-S53C	GRP 1 ISOL CH A-2
A-52B	20	(NO. 11 A TRAN-FMT)	NO. 11 A TRAN-FIRE MAN TRIP
A-52B	17	5A-S13B	TSV SCRAM CH B-1
A-52B	17	5A-S2B	SUBCHANNEL B1
A-52B	7	M-47B-1B9	TURBINE EMERGENCY TRIP
A-52B	20	(NO. 1 M TRANS-FMT)	NO. 1 MAIN TRANS-FIRE MAN TRIP
A-52B	17	5A-S12B	MSIV SCRAM CH B-1
A-52B	15	16A-S54C	GRP 2-3 ISOL CH A-2
A-52B	15	5A-S13A	TSV SCRAM CH A-1
A-52B	15	5A-S12A	MSIV SCRAM CH A-1
A-52B	15	5A-S13C	TSV SCRAM CH A-2
A-52B	17	16A-S53D	GRP 1-ISOL CH B-2
A-52B	15	5A-CB1A	RX PROTECTION AC MG SET POWER
A-52C	36	(CH 22 SRM (S3))	CH 22 SRM RESET
A-52C	36	(CH 24 SRM (S3))	CH 24 SRM RESET
A 52A	264B	HS-9000B	EFT SYSTEM MASTER SW
A 52B	15	16A-S53A	GRP 1 ISOL CH A-1
A 52B	15	16A-S54A	GRP 2-3 ISOL CH A-1
A 52B	17	5A-S12D	MSIV SCRAM CH B-2
A 52B	17	5A-S13D	TSV SCRAM CH B-2
A 52B	17	5A-S2D	SUBCHANNEL B2
A 52B	20	(BLDG SDG-FMT)	BUILDING SIDING-FIRE SYSTEM OP
A 52B	20	(NO. 1 R TRANS-FMT)	NO. 1R RESERV TR-FIRE MAN TRIP
A 52B	17	16A-S54D	GRP 2-3 ISOL CH B-2
A 52B	17	16A-S53B	GRP 1 ISOL CH B-1
A 52B	15	5A-S2A	SUBCHANNEL A1
A 52B	15	5A-S12C	MSIV SCRAM CH A-2
A 52B	15	5A-S2C	SUBCHANNEL A2
A 52B	17	16A-S54B	GRP 2-3 ISOL CH B-1
A 52C	36	(CH 21 SRM (S3))	CH 21 SRM RESET
A 52C	36	(CH 23 SRM (S3))	CH 23 SRM RESET

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A-53		6.4.2.2(a)		Shape coding for controls should be consistent throughout the control room (T-HANDLE=PUMP, J-HANDLE=VALVE, KEYLOCK=BYPASS).	The handles on these components will be changed to match the appropriate convention.	X						
A-54	A	6.4.2.2(a)		Color coding for controls should be consistent throughout the control room (CONVENTIONAL PUSHBUTTON COLOR IS SILVER).	The significance of this discrepancy has been evaluated. The effect of this deviation from the normal pushbutton color of silver is minimal. All future pushbuttons installed will be controlled by the convention specification. No corrective actions are planned.					X		
A-54	B	6.4.2.2(a)		Color coding for controls should be consistent throughout the control room (CONVENTIONAL PUSHBUTTON COLOR IS SILVER).	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
A-55	A	6.4.2.2(a)		Indicator lights for controls should be positioned in accordance with convention (GREEN SHOULD BE TO THE LEFT OF RED).	These lights will be re-arranged to match the arrangement of redundant lights for these breakers in the substation control house.	X						
A-55	B	6.4.2.2(a)		Indicator lights for controls should be positioned in accordance with convention (GREEN SHOULD BE TO THE LEFT OF RED).	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
A-55	C	6.4.2.2(a)		Indicator lights for controls should be positioned in accordance with convention (GREEN SHOULD BE TO THE LEFT OF RED).	The significance of this discrepancy has been evaluated. The effect of the deviation from the normal light orientation is minimal. All future light installations will be controlled by the convention specification. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A-55	D	6.4.2.2(a)		Indicator lights for controls should be positioned in accordance with convention (GREEN SHOULD BE TO THE LEFT OF RED).	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

A-55A	8	BN5/CS	MAIN GENERATOR BREAKER NO.2	A 55B	13	1-DS13	VALVE CONTROL CHANNEL 1:BALL VAL
A-55B	13	1-DS14	VALVE CONTROL CHANNEL 1:BALL VAL	A 55B	13	2-DS23	VALVE CONTROL CHANNEL 2:BALL VAL
A-55B	13	2-DS24	VALVE CONTROL CHANNEL 2:BALL VAL	A 55B	13	3-DS33	VALVE CONTROL CHANNEL 3:BALL VAL
A-55B	13	3-DS34	VALVE CONTROL CHANNEL 3:BALL VAL	A 55C	26	HS 3285B	O2 ANALYZER LOW RANGE
A-55C	26	HS 3285D	O2 ANALYZER HIGH RANGE	A 55D	252B	FCS 7490A	OFFGAS INLET FCV-7489A
A-55D	252B	FCS 7496A	STEAM TRAIN A FCV-7496A	A 55D	252B	FCS 7557A	OFFGAS OUTLET FCV-7557A
A-55D	252B	HS 7516A	RECOMBINER BYPASS TCV-7516A	A 55B	252B	HS 7517A	RECOMBINER INLET TCV-7517A
A-55D	252C	FCS 7557B	OFFGAS OUTLET FCV-7557B	A 55B	252C	FCS-7490B	OFFGAS INLET FCV-7489B
A-55D	252C	FCS-7498B	STEAM TRAIN B FCV-7498B	A 55B	252C	HS 7516B	RECOMBINER BYPASS TCV-7516B
A-55D	252C	HS 7517B	RECOMBINER INLET TCV 7517B	A 55D	252D	HS-7682	RECOMBINER STEAM SUPPLY
A-55D	252D	HS-7685	VAC BREAKER & AIR PURGE				

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A-58		6.6.1.2(a)(3)	RECORDER	Component labels should clearly identify the functien and identity of all components.	These HEDs will be resolved as part of the Control Room Re-labeling project.							X
C-1	A	6.4.2.2(e)	CNTS ROTARY CONTROL	Rotary controls for different types of control actions should be easily distinguishable by sight and touch.	Monticello will replace these knobs with controls that are more suitable for selection, as recommended in NUREG-0700.	X						
C-1	B	6.4.2.2(e)	CNTS ROTARY CONTROL	Rotary controls for different types of control actions should be easily distinguishable by sight and touch.	Panel C25 will be reviewed, and these controls will be revised at that time. A more appropriate selector control will be used.							X
C-1	C	6.4.2.2(e)	CNTS ROTARY CONTROL	Rotary centrols for different types of control actions should be easily distinguishable by sight and touch.	Monticello will replace the scale and adjustment knob for the components identified in this HED.	X						

C-1A	10	17-451A	POWER SUPPLY PROCESS MON	C 1A	10	17-451B	POWER SUPPLY PROCESS MON
C-1A	11	18-53A	POWER SUPPLY FOR AREA MONITOR	C 1A	11	18-53B	POWER SUPPLY FOR AREA MONITOR
C-1A	11	18-53C	POWER SUPPLY FOR AREA MONITOR	C 1A	11	ES 7774	POWER SUPPLY
C-1B	25	B033A1	DAMPER ADJUST CONTROL	C 1B	25	B033B2	DAMPER ADJUST
C-1B	25	B033C3	DAMPER ADJUST	C 1B	25	B033D4	DAMPER ADJUST CONTROL
C-1C	24A	HS 107A	CONTROLLED PURGE DAMPER CONTROL	C 1C	24B	HS 107B	CONTROLLED PURGE DAMPER CONTROL

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-2		6.4.4.4(a)	CNTS ROTARY CONTROL	Continuous rotary controls should be round in shape with knurled or serrated edges.	These components were listed because the knobs were selectors rather than round knobs as recommended in NUREG-0700. Monticello will review this requirement and replace these controls if good alternatives are available.							X
C-3	A	6.4.4.4(b)	CNTS ROTARY CONTROL	An engraved line should be filled with contrasting pigment.	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification. The area will be engraved and filled with pigment.	X						
C-3	B	6.4.4.4(b)	CNTS ROTARY CONTROL	An engraved line should be filled with contrasting pigment.	Monticello does not plan to change these components, as they are only used by operations engineers and not by operators.					X		

C-3A	10	17-451A	POWER SUPPLY PROCESS MON	C 3A	10	17-451B	POWER SUPPLY PROCESS MON
C-3A	11	18-53A	POWER SUPPLY FOR AREA MONITOR	C 3A	11	18-53B	POWER SUPPLY FOR AREA MONITOR
C-3A	11	18-53C	POWER SUPPLY FOR AREA MONITOR	C 3A	11	ES 7774	POWER SUPPLY
C-3B	259	(H2 SPAN)	CH A CONT ATM ANALZ-H2 SPAN ADJ	C 3B	259	(H2 ZERO)	CH A CONT ATM ANALZ-H2 ZERO ADJ
C-3B	259	(O2 SPAN)	CH A CTM ATM ANALZ-O2 SPAN	C 3B	259	(O2 ZERO)	CH A CTM ATM ANALZ-O2 ZERO
C-3B	260	(H2 SPAN)	CH A CONT ATM ANALZ-H2 SPAN ADJ	C 3B	260	(H2 ZERO)	CH A CONT ATM ANALZ-H2 ZERO ADJ
C-3B	260	(O2 SPAN)	CH A CTM ATM ANALZ-O2 SPAN	C 3B	260	(O2 ZERO)	CH A CTM ATM ANALZ-O2 ZERO

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-4		6.4.4.5(c)	CNTS ROTARY CONTROL	To maximize readability, rotary controls should have a moving pointer and fixed position settings.	Monticello does not plan to change these components, as they are only used by operations engineers and not by operators.					X		
C-5		6.5.1.3(b)(2)	CNTS ROTARY CONTROL	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply witb the Monticello convention specification.	X						
C-6		6.5.1.6(c)(2)	CNTS ROTARY CONTROL	Red, green, and amber should be reserved for purposes with immediate safety implications.	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit tbe convention spec, a neutral white light will be used.	X						
C-7		6.5.3.1(a)(1)	CNTS ROTARY CONTROL	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-8	A	6.6.1.2(a)(3)	CNTS ROTARY CONTROL	Component labels should clearly identify each element.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-8	B	6.6.1.2(a)(3)	CNTS ROTARY CONTROL	Component labels should clearly identify each element.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panels C252 A thru D.							X
C-9		6.6.2.2(a)	CNTS ROTARY CONTROL	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-10		6.6.2.3(a)	CNTS ROTARY CONTROL	Labels should be oriented horizontally.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-11		6.6.3.8(b)	CNTS ROTARY CONTROL	Direction of motion (increase, decrease) should be identified for continuous motion rotary controls.	Arrows will be added to show the rotary action of the component. This correction will be included in the Monticello Control Room Convention Specifications.	X						
C-12		6.6.5.1(b)	CNTS ROTARY CONTROL	Temporary labels (incl. DYMO labels) should not be substituted for standard	This HED will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				labels and should meet all label specs.								
C-13	A	6.4.2.1	CONTROLLER	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	These components have been replaced. The new components have been reviewed.							
C-13	B	6.4.2.1	CONTROLLER	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-14	A	6.4.4.5(c)	CONTROLLER	To maximize readability, rotary controls should have a moving pointer and fixed position settings.	The drain flow regulator is a system with a continuous rotary control and an associated meter. It is satisfactory as designed.					X		
C-14	B	6.4.4.5(c)	CONTROLLER	To maximize readability, rotary controls should have a moving pointer and fixed position settings.	These controls have been removed and replaced. The new components have been reviewed.							

C-14A 4 12-143 DRAIN FLOW REGULATOR C 14B 24A FIC 2943 SGTS FAN DISCHARGE
C-14B 24B FIC 2942 SGTS FAN DISCHARGE

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-15	A	6.4.4.5(d)(1)	CONTROLLER	Position indication should include an engraved line on top of the control and down the side, or a pointer.	Monticello will renew the red pigment dot on the selectors on these controllers to improve the visibility of the control. The continuous rotary control does not need a position indicator, as its feedback is displayed on the associated meter.	X						
C-15	B	6.4.4.5(d)(1)	CONTROLLER	Position indication should include an engraved line on top of the control and down the side, or a pointer.	These controls have been removed. The replacements have beenre-evaluated.							

C-15	4	SIC 2-184-16A	RECIRC PUMP A SPEED CONTROL	C 15	4	SIC 2-184-16B	RECIRC PUMP B SPEED CONTROL
C-15	5	FC 2-184-14	MASTER RECIRC FLOW CONTROL	C 15A	3	DPIC 10-130A	HX A TUBE TO SHELL DIFF PRESSURE
C-15A	3	DPIC 10-130B	HX B TUBE TO SHELL DIFF PRESSURE	C 15A	3	FIC 10-142A	HEAD COOLING FLOW
C-15A	3	FIC 23-108A	TURBINE SPEED	C 15A	4	12-143	DRAIN FLOW REGULATOR
C-15A	4	FIC 13-91	FLOW CONTROL	C 15A	5	FC 3-301	CRD FLOW CONTROL
C-15A	5	FC 6-85	MAN LOADING STA LOW FLOW VALVE	C 15A	6	FC 1095	COND. RECIRC FLOW CONTROL
C-15A	6	LC 1093	HOTWELL REJECT LEVEL CONTROL	C 15A	6	LC 1094	HOTWELL MAKE-UP LEVEL CONTROL
C-15A	7	PC 1246	11 SJAE PRESS CONTROL	C 15A	7	PC 1247	12 SJAE PRESS CONTROL
C-15A	8	TC 1589	GEN H2 COOLER WATER DISCHARGE	C 15A	20	LC 1013	HEATER E-12A DRAINS
C-15A	20	LC 1014	HEATER E-12A DUMP	C 15A	20	LC 1015	HEATER E-13A DRAINS
C-15A	20	LC 1016	HEATER E-13A DUMP	C 15A	20	LC 1017	HEATER E-14A DRAINS
C-15A	20	LC 1018	HEATER E-14A DUMP	C 15A	20	LC 1019	HEATER E-15A DRAINS
C-15A	20	LC 1020	HEATER E-15A DUMP	C 15A	20	LC 1052	HEATER E-12B DRAINS
C-15A	20	LC 1053	HEATER E-12B DUMP	C 15A	20	LC 1054	HEATER E-13B DRAINS
C-15A	20	LC 1055	HEATER E-13B DUMP	C 15A	20	LC 1056	HEATER E-14B DRAINS
C-15A	20	LC 1057	HEATER E-14B DUMP	C 15A	20	LC 1058	HEATER E-15B DRAINS
C-15A	20	LC 1059	HEATER E-15B DUMP	C 15B	24A	FIC 2943	SBTS FAN DISCHARGE
C-15B	24B	FIC 2942	SGTS FAN DISCHARGE				

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NG CORRECT	ALREADY FIXED	PENDING
C-16	A	6.5.1.3(b)(2)	CONTROLLER	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-16	B	6.5.1.3(b)(2)	CONTROLLER	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discropancies associated with panels C252 A thru D.							X
C-17		6.5.1.5(a)(1)	CONTROLLER	No more than nine graduations should separate numerals.	Monticello will change the meter scale to comply with the Monticello control room convention specification.	X						
C-18	A	6.5.1.5(a)(2)	CONTROLLER	For up to four graduations between numorals, major and minor graduations should be used.	Monticello will review the controller graduations to comply with the Monticello control room convention specification.							X
C-18	B	6.5.1.5(a)(2)	CONTROLLER	For up to four graduations between numerals, major and minor graduations should be used.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-19		6.5.1.5(a)(3)	CONTROLLER	For five or more graduations between numerals, major, minor, and intermediate graduations should be used.	Monticello will review the controller graduations to comply with the Monticello control room convention specification.							X
C-21		6.5.2.2(c)	CONTROLLER	Pointer/background contrast and pointer size should be adequate for rapid recognition.	Monticello does not plan a correction for this component, as it is used only for testing and not in operations.					X		
C-22		6.5.2.4(a)	CONTROLLER	Numerals on fixed scales (circular or linear) should be vertical.	Monticello does not plan to medify this component, because it is used for test and calibration, not operations.					X		
C-23	A	6.5.2.5	CONTROLLER	Moving-scale fixed-pointer meters should be avoided.	Monticello does not consider these components to be a problem, as long as they are put in a good position and have adequate lighting. They provide good precision for a wide range of values--better precision than a continuous rotary control.							

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-23	B	6.5.2.5	CONTROLLER	Moving-scale fixed-pointer meters should be avoided.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-24	A	6.6.1.2(a)(4)	CONTROLLER	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-24	B	6.6.1.2(a)(4)	CONTROLLER	Labels should not repeat information contained in higher-level labels.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-25	A	6.6.2.2(a)	CONTROLLER	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-25	B	6.6.2.2(a)	CONTROLLER	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-26		6.6.3.8(a)	CONTROLLER	All discrete functional control positions should be identified.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-27		6.6.3.8(b)	CONTROLLER	Direction of motion (increase, decrease) should be identified for continuous motion rotary controls.	Arrows will be added to show the rotary action of the component. This correction will be included in the Monticello Control Room Convention Specifications.	X						
C-28	A	6.4.2.1	KEY OPERATED CONTROL	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification.	X						
C-28	B	6.4.2.1	KEY OPERATED CONTROL	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-29	A	6.4.4.3(d)	KEY OPERATED CONTROL	Switch should be OFF (or SAFE) when key is in vertical position.	The Monticello convention specification will control the orientation of the functional position of keylock switches. Key removal will only be possible with the switch in the approved position.	X						
C-29	B	6.4.4.3(d)	KEY OPERATED CONTROL	Switch should be OFF (or SAFE) when key is in vertical position.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-29	C	6.4.4.3(d)	KEY OPERATED CONTROL	Switch should be OFF (or SAFE) when key is in vertical position.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panels C252 A thru D.							X
C-30		6.4.4.3(d)	KEY OPERATED CONTROL	Switch should be OFF (or SAFE) when key is in vertical position.	The Monticello convention specification will control the orientation of the functional position of keylock switches. Key removal will only be possible with the switch in the approved position.	X						
C-32	A	6.5.1.3(b)(2)	KEY OPERATED CONTROL	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the Monticello convention specification.	X						
C-32	B	6.5.1.3(b)(2)	KEY OPERATED CONTROL	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panel C13.							X
C-32	C	6.5.1.3(b)(2)	KEY OPERATED CONTROL	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solutiou to all discrepancies associated with panels C252 A tbru D.							X
C-33	A	6.5.1.3(c)	KEY OPERATED CONTROL	Visual displays should contain black markings on white backgrounds or be cleaned regularly.	Monticello will enhance the control boards with new labels that comply with the Monticello convention specification.	X						
C-33	B	6.5.1.3(c)	KEY OPERATED CONTROL	Visual displays should contain black markings on white backgrounds or be cleaned regularly.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-34	A	6.5.1.6(c)(2)	KEY OPERATED CONTROL	Red, green, and amber should be reserved for purposes with	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				immediate safety implications.	the convention spec, a neutral white light will be used.							
C-34	B	6.5.1.6(c)(2)	KEY OPERATED CONTROL	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-34	C	6.5.1.6(c)(2)	KEY OPERATED CONTROL	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-35		6.5.3.1(a)(1)	KEY OPERATED CONTROL	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-36		6.5.3.1(c)(2)	KEY OPERATED CONTROL	Interchange of lenses should be prevented by design or procedure.	Monticello will develop procedures for the correct replacement of lamps and lenses on indicators to solve this problem.				X			
C-37		6.6.1.2(a)(3)	KEY OPERATED CONTROL	Component labels should clearly identify the function and identity of components.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-38	A	6.6.2.2(a)	KEY OPERATED CONTROL	Labels should be mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-38	B	6.6.2.2(a)	KEY OPERATED CONTROL	Labels should be mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-38	C	6.6.2.2(a)	KEY OPERATED CONTROL	Labels should be mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-39		6.6.3.4(e)	KEY OPERATED CONTROL	Roman numerals should be avoided.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-40		6.6.3.8(a)	KEY OPERATED CONTROL	All discrete functional control positions should be identified.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTIGN/JUSTIFICATIGN	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-41		6.4.3.3(c)(2)	LEGEND PUSHBUTTON	Lamps within a pushbutton should be replaceable from the front of the panel.	These components can be replaced from the front panel. This was apparently a misunderstanding that did not get resolved earlier.							
C-42		6.4.3.3(c)(3)	LEGEND PUSHBUTTON	Legend pushbuttons should not short out or be deactivated during lamp replacement.	Monticello has reviewed the operation of these components to verify if there is a problem with shorting. The resolts of this review revealed that the lights associated with these devices can be changed without starting or inadvertently activating the device, however, it is relatively easy to inadvertently actuate these switches during the light replacement. The review concluded that the inadvertent actuation of tbese devices would have no significant consequences. The manual scram pushbuttons were found to be a problem in that they were made inoperable during bulb replacement. A procedure will be generated to cover bulb replacement of theso two pushbuttons.				X			
C-43		6.4.3.3(c)(4)	LEGEND PUSHBUTTON	Legend covers should be keyed to prevent interchanging covers.	Monticello will develop a procedure to control bulb replacement in lighted legend covers.			X	X			
C-44		6.4.3.3(d)(1)	LEGEND PUSHBUTTON	Barriers should be used when legend pushbuttons are contiguous.	Monticello does not plan to correct these problems because a replacement system is being procured. The new Rod Worth Minimizer will correct this problem.							X
C-45		6.4.3.3(d)(2)	LEGEND PUSHBUTTON	Barriers should have rounded edges.	Theso components do have rounded edges—no correction is planned.					X		
C-46		6.5.1.3(b)(2)	LEGEND PUSHBUTTON	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the Monticello convention specification.	X						
C-47		6.5.1.6(c)(2)	LEGEND PUSHBUTTGN	Red, green, and amber should be reserved for purposes with immediate safey implications.	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit the convention spec, a neutral white light will be used.	X						
C-50		6.5.3.3(a)(2)	LEGEND PUSHBUTTON	Legends on buttons should be legible under ambient illumination with indicator lights off.	Monticello does not intend to change these devices. In the opinion of the Control Room Review Committee, these devices are acceptable. In addition, a review and improvements to the control room lighting are presently being made.					X		

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-51		6.5.3.3(a)(3)	LEGEND PUSHBUTTON	Legend lettering on buttons should contrast well with background.	Monticello will review this problem after changes in lighting, carpeting, and painting are completed. It may be necessary to implement procedures for preventative maintenance to maintain contrast on these components.				X			X
C-52		6.5.3.3(c)	LEGEND PUSHBUTTON	Illuminated legend status lights should be readily distinguishable from legend pushbuttons.	Monticello will enhance these with painting and/or label changes.	X						
C-53		6.6.1.2(a)(3)	LEGEND PUSHBUTTON	Component labels should clearly identify each element.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-54		6.6.2.2(a)	LEGEND PUSHBUTTON	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-55		6.6.4.2(a)	LEGEND PUSHBUTTON	Labels should have all simple capital letters.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-56		6.6.5.1(b)	LEGEND PUSHBUTTON	Temporary labels (incl. DYMO labels) should not be substituted for standard labels and comply with all label specs.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-58	A	6.5.1.3(b)(2)	ROUND PUSHBUTTON	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the Monticello convention specification.	X						
C-58	B	6.5.1.3(b)(2)	ROUND PUSHBUTTON	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-59		6.5.1.4(d)	ROUND PUSHBUTTON	Abbreviations should be standard and used only when necessary.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-60	A	6.5.1.6(c)(2)	ROUND	Red, green, and amber should	Monticello will change all colors in the CR to conform with the	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
			PUSHBUTTON	be reserved for purposes with immediate safety implications.	Monticello convention specification. For applications that don't fit the convention spec, a neutral white light will be used.							
C-60	B	6.5.1.6(c)(2)	ROUND PUSHBUTTON	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-60	C	6.5.1.6(c)(2)	ROUND PUSHBUTTON	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-61		6.5.3.1(a)(1)	ROUND PUSHBUTTON	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-63		6.5.3.1(c)(2)	ROUND PUSHBUTTON	Provisions should be made to prevent interchanging indicator lenses.	Monticello will develop procedures for the correct replacement of lamps and lenses on indicators to solve this problem.				X			
C-64		6.5.3.2(a)(1)	ROUND PUSHBUTTON	Labelling must he provided close to the light indicator, when meaning is not apparent.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any ambiguity, or if there is a mismatch between code and function, then a small text label will he added there, and the color will be changed.	X						
C-65	A	6.6.1.2(a)(3)	ROUND PUSHBUTTON	Component labels should clearly identify the function and identity of all components.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-65	B	6.6.1.2(a)(3)	ROUND PUSHBUTTON	Component labels should clearly identify the function and identity of all components.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-66	A	6.6.1.2(a)(4)	ROUND PUSHBUTTON	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-66	B	6.6.1.2(a)(4)	ROUND PUSHBUTTON	Labels should not repeat information contained in higher-level labels.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-67	A	6.6.2.2(a)	ROUND PUSHBUTTON	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-67	B	6.6.2.2(a)	ROUND PUSHBUTTON	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-68		6.6.2.3(a)	ROUND PUSHBUTTON	Labels should be oriented horizontally.	The solution to these discrepancies will he resolved as part of the solution to all discrepancies associated witb panels C252 A thru D.							X
C-69		6.6.2.4(a)	ROUND PUSHBUTTON	Labels should not obstruct any other information source.	Monticello will review these problems and use the convention spec to guide any necessary revisions.							X
C-70	A	6.6.2.4(b)	ROUND PUSHBUTTON	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated witb the component to which they are attached.							X
C-70	B	6.6.2.4(h)	ROUND PUSHBUTTON	Labels should not be obscured.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-71		6.6.4.2(a)	ROUND PUSHBUTTON	Labels should have all simple capital letters.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-72	A	6.6.5.1(b)	ROUND PUSHBUTTON	Temporary labels (DYMO labels) should not be substituted for standard labels and should conform to all label specs.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-72	B	6.6.5.1(b)	ROUND PUSHBUTTON	Temporary labels (DYMO labels) should not be substituted for standard labels and should	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				conform to all label specs.								
C-73	A	6.4.2.1	ROTARY SELECTOR	Control movements should conform to accepted movement conventions (open = right, close = loft, etc.)	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with tbat specification.							X
C-73	B	6.4.2.1	ROTARY SELECTOR	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	The solution to tbese discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-73	C	6.4.2.1	ROTARY SELECTOR	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-74	A	6.4.4.1(c)	ROTARY SELECTOR	Controls should be recngnizable visually and tactually (by touch). Illustrations are available in NUREG-0700 (Fig 6.4-6).	Monticello will change the convention spec to show a specified shape for rotary solectors and then match the components to this spec.	X						
C-74	B	6.4.4.1(c)	ROTARY SELECTOR	Controls should be recognizable visually and tactually (by touch). Illustrations are available in NUREG-0700 (Fig 6.4-6).	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-75		6.4.4.5(c)	ROTARY SELECTOR	To maximize readability, rotary controls should have a moving pointer and fixed position settings.	Monticello will revise tbe design of this component, probably with a keylock switch.		X					
C-76	A	6.4.4.5(d)(1)	ROTARY SELECTOR	Position indication should include an engraved line on top of the control and down the side, or a pointer.	Monticello will review enhancing the design of these controls with another knob that has a shape appropriate for a selector. Althougb the cemponent is not used often, operations does use them for calibrating the computer.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-76	B	6.4.4.5(d)(1)	ROTARY SELECTOR	Position indication should include an engraved line on top of the control and down the side, or a pointer.	These components do not nned the engraving, because their feedback is available on an associated display.					X		
C-76	C	6.4.4.5(d)(1)	ROTARY SELECTOR	Position indication should include an engraved line on top of the control and down the side, or a pointer.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-76	D	6.4.4.5(d)(1)	ROTARY SELECTOR	Position indication should include an engraved line on top of the control and down the side, or a pointer.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-77	A	6.5.1.3(b)(2)	ROTARY SELECTOR	Labels should have a consistent type style.	Monticello will enhance tbe control boards with new labels that comply with the Monticello convention specification.	X						
C-77	B	6.5.1.3(b)(2)	ROTARY SELECTOR	Labels should have a consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-77	C	6.5.1.3(b)(2)	ROTARY SELECTOR	Labels should have a consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-78	A	6.5.1.3(c)	ROTARY SELECTOR	Visual displays should contain black markings on white backgrounds.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-78	B	6.5.1.3(c)	ROTARY SELECTOR	Visual displays should contain black markings on white backgrounds.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.	X						
C-79		6.5.1.4(d)	ROTARY SELECTOR	Abbreviations should be standard.	Monticello will enhance the control boards with new labels that comply with control room convention specification.	X						
C-80	A	6.5.1.6(c)(2)	ROTARY SELECTOR	Red, green, and amber should be reserved for purposes with	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit	X						

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				immediate safety implications.	the convention spec, a neutral white light will be used.							
C-80	B	6.5.1.6(c)(2)	ROTARY SELECTOR	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-80	C	6.5.1.6(c)(2)	ROTARY SELECTOR	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-81		6.5.3.1(a)(1)	ROTARY SELECTOR	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-83		6.5.3.1(c)(2)	ROTARY SELECTOR	Provisions should be made to prevent interchanging indicator lenses, either by design or procedure.	Monticello will develop procedures for the correct replacement of laeps and lenses on indicators to solve this problem.				X			
C-84		6.5.3.2(a)(1)	ROTARY SELECTOR	When meaning is not apparent, labeling should he provided close to the appropriate light indicator.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any embiguity for indicator meaning (different than color code), then a small text will be added.	X						
C-86	A	6.6.1.2(a)(3)	ROTARY SELECTOR	Component labels should clearly identify each element.	These HEDs will be resolved as part of tbe Control Room Re-labeling project.	X						
C-86	B	6.6.1.2(a)(3)	ROTARY SELECTOR	Component labels should clearly identify each element.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated witb panels C252 A thru D.							X
C-87		6.6.1.2(a)(4)	ROTARY SELECTOR	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-88	A	6.6.2.2(a)	ROTARY SELECTOR	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-88	B	6.6.2.2(a)	ROTARY SELECTOR	Labels should be permanently mountod to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-89		6.6.2.3(a)	ROTARY SELECTOR	Labels should be oriented horizontally.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-90		6.6.2.4(b)	ROTARY SELECTOR	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-91		6.6.3.4(b)	ROTARY SELECTOR	Words or symbols on labels should be unique and easily distinguishable.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-92	A	6.6.3.8(a)	ROTARY SELECTOR	All disrete functional control positions should be identified.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-92	B	6.6.3.8(a)	ROTARY SELECTOR	All disrete functional control positions should be identified.	The solution to tbese discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-93		6.6.5.1(b)	ROTARY SELECTOR	Temporary labels should not be substituted for standard labels and conform to good human engineering principles.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-94	A	6.4.2.1	J-HANDLE OR T-HANDLE	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	Monticello will review these cemponents against the Monticello convention spec and make changes as necessary to conform with that specification.	X						
C-94	B	6.4.2.1	J-HANDLE OR T-HANDLE	Control movements should conform to accepted movement conventions (open = right,	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification. For components tbat are not includod in the	X						

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				close = left, etc.)	specification, amendments to the specification will be made to include these cases, as long as there are not conflicts with previous conventions.							
C-94	C	6.4.2.1	J-HANDLE OR T-HANDLE	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification.	X						
C-94	D	6.4.2.1	J-HANDLE OR T-HANDLE	Control movements should conform to accepted movement conventions (open = right, close = left, etc.)	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-95		6.4.4.4(b)	J-HANDLE OR T-HANDLE	An engraved line should be filled with contrasting pigment.	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with tbat specification. This will be done with engraving and painting.	X						
C-96	A	6.4.4.5(d)(1)	J-HANDLE OR T-HANDLE	Position indication should include an engraved line on top of the control and down the side, or a pointer.	Monticello will add engraved lines or pointers to these components.	X						
C-96	B	6.4.4.5(d)(1)	J-HANDLE OR T-HANDLE	Position indication should include an engraved line on top of the control and down the side, or a pointer.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-97	A	6.4.4.5(d)(2)	J-HANDLE OR T-HANDLE	It should not be possible to confuse control position in reference to position markers on the panel.	Monticello will change the labeling on the faceplate of the control so that position of the control is clearer.	X						
C-97	B	6.4.4.5(d)(2)	J-HANDLE OR T-HANDLE	It should not be possible to confuse control position in reference to position markers on the panel.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associatod with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-98	A	6.5.1.3(b)(2)	J-HANDLE OR T-HANDLE	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-98	B	6.5.1.3(b)(2)	J-HANDLE OR T-HANDLE	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-99		6.5.1.4(c)	J-HANDLE OR T-HANDLE	Labels should be brief, that is, written as briefly as clarity permits.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-100	A	6.5.1.6(c)(2)	J-HANDLE OR T-HANDLE	Red, green, and amber should be reserved for purposes with immediate safety implications.	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit the convention spec, a neutral white light will be used.	X						
C-100	B	6.5.1.6(c)(2)	J-HANDLE OR T-HANDLE	Red, green, and amber should be reserved for purposes with immediate safety implications.	Monticello will change all colors in the CR to conform with the Monticello conventien specification. For applications that don't fit the convention spec, a neutral white light will be used.	X						
C-101		6.5.3.1(a)(1)	J-HANDLE OR T-HANDLE	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-103		6.5.3.1(c)(2)	J-HANDLE OR T-HANDLE	Interchange of lenses should be prevented by design or procedure.	Monticello will develop procedures for the correct replacement of lamps and lenses on indicators to solve this problem.				X			
C-104		6.5.3.2(a)(1)	J-HANDLE OR T-HANDLE	Labelling must be provided close to the light indicator, where meaning is not apparent.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any ambiguity for indicator meaning (different than color code), then a small text will be added.	X						
C-105	A	6.6.1.2(a)(3)	J-HANDLE OR T-HANDLE	Component labels should clearly identify each element.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-105	B	6.6.1.2(a)(3)	J-HANDLE OR T-HANDLE	Component labels should clearly identify each element.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-106	A	6.6.1.2(a)(4)	J-HANDLE OR	Labels should not repeat	These HEDs will be resolved as part ef the Control Room Re-labeling	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
			T-HANDLE	information contained in higher-level labels.	project.							
C-106	B	6.6.1.2(a)(4)	J-HANDLE OR T-HANDLE	Lahels should not repeat information contained in higher-level labels.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panels C252 A thru D.							X
C-107		6.6.2.2(a)	J-HANDLE OR T-HANDLE	Labels should be mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-108		6.6.2.3(a)	J-HANDLE OR T-HANDLE	Labels should be oriented horizontally.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-109	A	6.6.2.4(a)	J-HANDLE OR T-HANDLE	Labels should not obstruct any other information source.	Monticello will review these problems and use the convention spec to guide any necessary revisions.							X
C-109	B	6.6.2.4(a)	J-HANDLE OR T-HANDLE	Labels should not obstruct any other information source.	The solution to these discrepancies will he resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-110	A	6.6.2.4(b)	J-HANDLE OR T-HANDLE	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding cemponents, altheugh the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-110	B	6.6.2.4(b)	J-HANDLE OR T-HANDLE	Labels should not be obscured.	The solution to these discropancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-111	A	6.6.3.8(a)	J-HANDLE OR T-HANDLE	All discrete functional control positions should be identified.	Theso HEDs will he resolved as part of the Control Room Re-labeling project.	X						
C-111	B	6.6.3.8(a)	J-HANDLE OR T-HANDLE	All discrete functional control positions should be identified.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-113	A	6.6.4.2(a)	J-HANDLE OR T-HANDLE	Labels should have all simple capital letters.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-113	B	6.6.4.2(a)	J-HANDLE OR T-HANDLE	Labels should have all simple capital letters.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-114	A	6.6.5.1(b)	J-HANDLE OR T-HANDLE	Temporary labels should conform to good human engineering principles.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-114	B	6.6.5.1(b)	J-HANDLE OR T-HANDLE	Temporary labels should conform to good human engineering principles.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-115	A	6.6.5.1(c)	J-HANDLE OR T-HANDLE	Temporary labels should not obscure prior permanent labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-115	B	6.6.5.1(c)	J-HANDLE OR T-HANDLE	Temporary labels should not obscure prior permanent labels.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-116		6.4.4.3(f)	SWITCH	All control positions should be labelled.	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification.	X						
C-117		6.5.1.3(b)(2)	SWITCH	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-118		6.6.1.2(a)(3)	SWITCH	Component lahels should clearly identify the function and identity of each component.	These HEDs will be reselved as part of the Control Room Re-labeling project.	X						
C-119		6.6.1.2(a)(4)	SWITCH	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-120		6.6.2.2(a)	SWITCH	Labels should be permanently mounted to prevent accidental	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				removal.								
C-121		6.6.2.4(b)	SWITCH	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-122		6.6.3.2(f)	SWITCH	Words should be correctly spelled and use the standard abbreviations.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-123		6.6.5.1(b)	SWITCH	Temporary labels (DYMO labels) should not be substituted for standard labels and conform to all label specs.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-124	A	6.5.1.3(b)(2)	DIGITAL DISPLAY	Labels should have consistent type style.	Monticello will enhance the control boards with new lahels that comply with the control room convention specification.	X						
C-124	B	6.5.1.3(b)(2)	DIGITAL DISPLAY	Labels should have consistent type style.	The solution to theso discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-128	A	6.6.1.2(a)(3)	DIGITAL DISPLAY	Component labels should clearly identify the function and identity of each component.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-128	B	6.6.1.2(a)(3)	DIGITAL DISPLAY	Component labels should clearly identify the function and identity of each component.	Monticello will enhance the control boards with new labels that comply with the control room convention specification. Some modification of the convention spec requirements may be necessary for these components to allow for space limitations.	X						
C-128	C	6.6.1.2(a)(3)	DIGITAL DISPLAY	Component labels should clearly identify the function and identity of each component.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-129		6.6.1.2(a)(4)	DIGITAL DISPLAY	Labels should not repeat	These HEDs will be resolved as part of the Control Room Re-labeling	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				information contained in higher-level labels.	project.							
C-130	A	6.6.2.2(a)	DIGITAL DISPLAY	Labels should he permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-130	B	6.6.2.2(a)	DIGITAL DISPLAY	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panel C13.							X
C-131		6.6.2.4(a)	DIGITAL DISPLAY	Labels should not obstruct any other information source.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although tbe hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-132		6.6.5.1(b)	DIGITAL DISPLAY	Temporary labels should not be substituted for standard labels and conform to all label specifications.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-134	A	6.5.1.3(b)(2)	INDICATOR LIGHT	Labels should have consistent type style.	Monticello will enhance the control boards witb new labels that comply with the control room convention specificatien. Some modification of the convention spec requirements may be necessary for these components to allow for space limitations.	X						
C-134	B	6.5.1.3(b)(2)	INDICATOR LIGHT	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-135		6.5.1.4(c)	INDICATOR LIGHT	Labels should be written as briefly as clarity permits.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-136		6.5.1.4(d)	INDICATOR LIGHT	Abbreviations should be standardardized and applied consistently.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-137	A	6.5.1.6(c)(2)	INDICATOR LIGHT	Red, green, and amber shonld be reserved for purposes with	Monticello will change all colors in the CR to conform with tbe Monticello convention specification. For applications that don't fit	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				immediate safety implications.	the convention spec, a neutral white light will be used.							
C-137	B	6.5.1.6(c)(2)	INDICATOR LIGHT	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-137	C	6.5.1.6(c)(2)	INDICATOR LIGHT	Red, green, and amber should be reserved for purposes with immediate safety implications.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-138		6.5.3.1(a)(1)	INDICATOR LIGHT	Dual-bulb or dual-filament light assemblies should be used.	Monticello does not plan to add dual-filament bulbs nor add test switches for bulbs.					X		
C-140		6.5.3.1(c)(2)	INDICATOR LIGHT	Interchange of lenses should be prevented by design or procedure.	Monticello will develop procedures for the correct replacement of lamps and lenses on indicators to solve this problem.				X			
C-142		6.5.3.2(a)(1)	INDICATOR LIGHT	Labelling must be provided close to the light indicator, when meaning is not apparent.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any ambiguity for indicator meaning (different than color code), then a small text will be added.	X						
C-143		6.5.3.2(a)(1)	INDICATOR LIGHT	Labelling must be provided close to the light indicator, when meaning is not apparent.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any embiguity for indicator meaning (different than color code), then a small text will be added.	X						
C-144	A	6.5.3.2(a)(3)	INDICATOR LIGHT	Color of lights should be clearly identifiable.	Monticello will replace lenses as required for lamps where the color has faded and become unclear. The white covers develop a yellow/amber appearance and the small lamps become sooty and dark. They will be replaced and checked periedically.	X						
C-144	B	6.5.3.2(a)(3)	INDICATOR LIGHT	Color of lights should be clearly identifiable.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-146	A	6.6.1.2(a)(3)	INDICATOR LIGHT	Component labels should clearly identify each element.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-146	B	6.6.1.2(a)(3)	INDICATOR LIGHT	Component labels should	The solution to these discrepancies will he resolved as part of the							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				clearly identify each element.	solution to all discrepancies associated with panels C252 A thru D.							
C-147		6.6.1.2(a)(4)	INDICATOR LIGHT	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-148	A	6.6.2.2(a)	INDICATOR LIGHT	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-148	B	6.6.2.2(a)	INDICATOR LIGHT	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-149	A	6.6.2.3(a)	INDICATOR LIGHT	Labels should be oriented horizontally.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-149	B	6.6.2.3(a)	INDICATOR LIGHT	Labels should be oriented horizontally.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-150		6.6.2.4(b)	INDICATOR LIGHT	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-151		6.6.3.2(f)	INDICATOR LIGHT	Words should be correctly spelled.	These HEDs will he resolved as part of the Control Room Re-labeling project.	X						
C-152		6.6.3.4(b)	INDICATOR LIGHT	Symbols should be unique and easily distinguishable.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-153		6.6.3.6	INDICATOR LIGHT	Words and abbreviations of similar appearance should be avoided.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-154	A	6.6.5.1(b)	INDICATOR LIGHT	Temporary labels (including DYMO labels) should not be substituted for standard	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				labels and conform to all label specs.								
C-154	B	6.6.5.1(b)	INDICATOR LIGHT	Temporary labels (including DYMO labels) should not be substituted for standard labels and conform to all label specs.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-155		6.4.3.3(c)(1)	LEGEND STATUS LIGHT	A lamp test or dual lamp/filament capability should be provided.	Monticello will not add dual-filament bulbs as they are not available. If the bulb has failed, other sources are available for the operator to determine if the bulb has failed or if the state of the control has changed.					X		
C-158		6.5.1.3(b)(2)	LEGEND STATUS LIGHT	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-159		6.5.1.3(c)	LEGEND STATUS LIGHT	Visual display should normally be black markings on a white background.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-160		6.5.1.6(c)(2)	LEGEND STATUS LIGHT	Red, green, and amber should be reserved for purposes with immediate safety implications.	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit the convention spec, a neutral white light will be used.	X						
C-162		6.5.3.3(a)(3)	LEGEND STATUS LIGHT	Legend lettering should contrast well with background.	Monticello will review this problem after changes in carpeting, lighting, and paint. Preventative maintenance procedures will be considered as a partial solution.				X			X
C-163		6.5.3.3(c)	LEGEND STATUS LIGHT	Illuminated legend indicators should be readily distinguishable from legend pushbuttons.	Monticello does not plan to change theso components. Attompting to depress an illuminated legend indicator would not have an impact on plant operations.					X		
C-164		6.6.1.2(a)(3)	LEGEND STATUS LIGHT	Component labels should clearly identify each element.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-165		6.6.2.2(a)	LEGEND STATUS	Labels should be permanently	These HEDs will be resolved as part of the Control Room Re-labeling	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
			LIGHT	mounted to prevent accidental removal.	project.							
C-168	A	6.5.1.3(b)(2)	METER	Labels should have consistent type style.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-168	B	6.5.1.3(b)(2)	METER	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-169		6.5.1.3(c)	METER	Visual displays should contain black markings on white backgrounds.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-170	A	6.5.1.4(a)	METER	Display face messages must be presented close to the scale.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-170	B	6.5.1.4(a)	METER	Display face messages must be presented close to the scale.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-171	A	6.5.1.4(b)	METER	Extraneous information on displays should be avoided.	Monticello will not remove the manufacturer's trademark. Monticello feels that the information is desirable for information purposes.					X		
C-171	B	6.5.1.4(b)	METER	Extraneous information on displays should be avoided.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-172		6.5.1.4(c)	METER	Labels should be written as briefly as clarity permits.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-173		6.5.1.4(d)	METER	Abbreviations should be standard.	Monticello will enhance the control boards with new labels that comply with the control room convention specification.	X						
C-174	A	6.5.1.5(a)(1)	METER	No more than nine graduatiens should separate numerals.	Monticello will change the meter scale to comply with the Monticello convention specification.	X						
C-174	B	6.5.1.5(a)(1)	METER	No more than nine graduations should separate numerals.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-175	A	6.5.1.5(a)(2)	METER	For up to 4 graduations	Monticello will enhance the meter scale to comply with the Monticello	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				between numerals, major and minor graduations should be used.	convention specification.							
C-175	B	6.5.1.5(a)(2)	METER	For up to 4 graduations between numerals, major and minor graduations should be used.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-176		6.5.1.5(a)(3)	METER	For five or more graduations between numerals, major, minor, and intermodiate graduations should be used.	Monticello will enhance the meter scale to comply with the Monticello convention specification.	X						
C-177	A	6.5.1.5(c)	METER	Unit graduations should be one, two, five, or ten, or those multiplied by a power of ten.	Monticello will change the meter scale to comply with the Monticello control room convention specification.	X						
C-177	B	6.5.1.5(c)	METER	Unit graduations should be one, two, five, or ten, or those multiplied by a power of ten.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-180		6.5.2.1	METER	Scale values should increase clockwise, upwards, or to the right.	Monticello does not plan any changes to this component. It is a special case for indication (period indication) where numbers decrease to the right as the parameter increases.					X		
C-181	A	6.5.2.2(b)(1)	METER	Pointer tip should extend to within one sixteenth inch of smallest graduation marks.	Monticello will review the option of changing the pointer to solve this problem. Monticello does not plan to order new equipment to solve the problem.							X
C-181	B	6.5.2.2(b)(1)	METER	Pointer tip should extend to within one sixteenth inch of smallest graduation marks.	These meters are usable even though they extend beyond the 1/16 in. spec, because the pointer is very thin. No correction is necessary.					X		
C-181	C	6.5.2.2(b)(1)	METER	Pointer tip should extend to within one sixteenth inch of	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				smallest graduation marks.								
C-183	A	6.5.2.2(c)	METER	Pointer/background contrast and pointer size should be adequate for rapid recognition.	Monticello has replaced these components, the suitability of which will be verified during the review.						X	
C-183	B	6.5.2.2(c)	METER	Pointer/background contrast and pointer size should be adequate for rapid recognition.	Monticello will review the possibilities for solutions: adding a color for the pointer tip that gives better contrast or providing better illumination, or both.	X						
C-183	C	6.5.2.2(c)	METER	Pointer/background contrast and pointer size should be adequate for rapid recognition.	Component has been removed from the panel.							

C-183A	3	LI 2-3-91A	REACTOR LEVEL A	C 183A	3	LI 2-3-91B	REACTOR LEVEL B
C-183A	5	LI 2-3-85A	RPS LEVEL	C 183A	5	LI 2-3-85B	RPS LEVEL
C-183B	4	FI 13-91	RCIC SYS FLOW INDICATOR	C 183B	4	LI 2996	SUPPR CHAMBER LEVEL
C-183B	6	PI 1476	INST AIR HEADER	C 183B	10	17-150A	OFF GAS CH 1
C-183B	10	17-150B	OFF GAS CH 2	C 183B	10	17-251A	MAIN STEAM LINE CHANNEL A
C-183B	10	17-251B	MAIN STEAM LINE CHANNEL B	C 183B	10	17-251C	MAIN STEAM LINE CHANNEL C
C-183B	10	17-251D	MAIN STEAM LINE CHANNEL D				

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-184	A	6.5.2.3(a)	METER	Zone markings should be conspicuous and distinct for each zone.	Monticello will apply the convention spec recommendations for zone markings, including the replacement of some inadequate zone markings already in place.	X						
C-184	B	6.5.2.3(a)	METER	Zone markings should be conspicuous and distinct for each zone.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-184	C	6.5.2.3(a)	METER	Zone markings should be conspicuous and distinct for each zone.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-185		6.5.2.3(b)	METER	Zone markings should not interfere with quantitative markings.	Monticello will remove the zone markings currently in place and replace with zone markings as defined in the convention spec. The current markings obscure the meter graduations, or have severe problems with parallax.	X						
C-186	A	6.5.2.3(c)	METER	Color for zone markings should be consistent with other uses of color coding.	Monticello will use the convention specifications color coding for all applications where color coding is used.	X						
C-186	B	6.5.2.3(c)	METER	Color for zone markings should be consistent with other uses of color coding.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-186	C	6.5.2.3(c)	METER	Color for zone markings should be consistent with other uses of color coding.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-187		6.5.2.4(a)	METER	Numerals on fixed scales (circular or linear) should be vertical.	A review of these instruments revealed that even though this criteria is not satisfied, the orientation of the meter numerals does not hamper significantly an operator's ability to read these meters. No corrective actions are planned.					X		
C-188		6.5.2.5	METER	Moving-scale fixed-pointer meters should be avoided.	Monticello does not plan to change this meter, finding it functional for its infrequent use.					X		

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-189	A	6.6.1.2(a)(3)	METER	Component labels should clearly identify each element.	These HEDs will be reselved as part of the Control Room Re-labeling project.	X						
C-189	B	6.6.1.2(a)(3)	METER	Component labels should clearly identify each element.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-189	C	6.6.1.2(a)(3)	METER	Component labels should clearly identify each element.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-190	A	6.6.1.2(a)(4)	METER	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-190	B	6.6.1.2(a)(4)	METER	Labels should not repeat information contained in higher-level labels.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-191	A	6.6.2.2(a)	METER	Labels should be permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-191	B	6.6.2.2(a)	METER	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-192	A	6.6.2.3(a)	METER	Labels should be oriented horizontally.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-192	B	6.6.2.3(a)	METER	Labels should be oriented horizontally.	The solution to these discrepancies will he resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-193		6.6.2.4(a)	METER	Labels should not obstruct any other information source.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-194	A	6.6.2.4(b)	METER	Labels should not be obscured.	Monticello will review this problem and find a way to affix	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
					hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.							
C-194	B	6.6.2.4(b)	METER	Labels should not be obscured.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-195		6.6.3.2(f)	METER	Words should be correctly spelled.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-196		6.6.3.4(e)	METER	Roman numerals should he avoided.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-197		6.6.3.6	METER	Words and abbreviations of similar appearance should he avoided.	These components have been changed and will be relabeled.	X						
C-198	A	6.6.5.1(b)	METER	Temporary labels should not be substituted for standard labels and conform to all label specs.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-198	B	6.6.5.1(b)	METER	Temporary labels should not be substituted for standard labels and conform to all label specs.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-199		6.6.5.1(c)	METER	Temporary labels should not obscure prior permanent labels.	This HED will be resolved as part of the Control Room Re-labeling project.	X						
C-200		6.5.1.2(e)	RECORDER	Scale ranges must he clearly marked to expand the scale, i.e., with the operator (X OR /) and the factor to be used (10, 100, etc)	The original problem was possibly the use of two meter scales on this equipment. Monticello will remove the second (red) scale that reads from 0-40 because it is not used in operations or by instrumentation engineers.	X						
C-201	A	6.5.1.3(b)(2)	RECORDER	Labels should have consistent	Monticello will enhance the control boards with new labels that comply	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				type style.	with the Monticello control room convention specification.							
C-201	B	6.5.1.3(b)(2)	RECORDER	Labels should have consistent type style.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-202	A	6.5.1.4(a)	RECORDER	Display face messages must be presented close to the scale.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-202	B	6.5.1.4(a)	RECORDER	Display face messages must he presented close to the scale.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-202	C	6.5.1.4(a)	RECORDER	Display face messages must be presented close to the scale.	The solution to theso discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-203	A	6.5.1.4(b)	RECORDER	Extraneous information on displays should be avoided.	Monticello will enhance the control hoards with new labels that comply with the Monticello control room convention specification.	X						
C-203	B	6.5.1.4(b)	RECORDER	Extraneous information on displays should be avoided.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C-203	C	6.5.1.4(b)	RECORDER	Extraneous information on displays should be avoided.	The solution to these discrepancies will he resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-204		6.5.1.4(c)	RECORDER	Labels should be written as briefly as clarity permits.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-205		6.5.1.4(d)	RECORDER	Abbreviations should he standardized and applied consistently.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-206	A	6.5.1.5(a)(1)	RECORDER	No more than nine graduations should separate numerals on recorders.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-206	B	6.5.1.5(a)(1)	RECORDER	No more than nine graduations should separate numerals on recorders.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C-207		6.5.1.5(a)(2)	RECORDER	For up to four graduations between numerals, major and minor graduations should be used.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-208	A	6.5.1.5(a)(3)	RECORDER	For five or more graduations between numerals, major, minor, and intermediate graduations should be used.	Monticello will enhance the control boards with new labels that comply with the Monticello control room convention specification.	X						
C-208	B	6.5.1.5(a)(3)	RECORDER	For five or more graduations between numerals, major, minor, and intermediate graduations should be used.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-209		6.5.1.5(c)	RECORDER	Unit graduations should he one, two, five, or ten, or those multiplied by a power of ten.	Monticello will change the meter scale to comply with the Monticello control room convention specification.	X						
C-210		6.5.2.4(a)	RECORDER	Numerals on fixed scales (circular or linear) should be vertical.	These components do not appear to require modification; the original HED was in error.							
C-221	A	6.6.1.2(a)(4)	RECORDER	Lahels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-221	B	6.6.1.2(a)(4)	RECORDER	Labels should not repeat information contained in higher-level labels.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-222	A	6.6.1.2(a)(4)	RECORDER	Labels should not repeat information contained in higher-level labels.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-222	B	6.6.1.2(a)(4)	RECORDER	Labels should not repeat	The solution to these discrepancies will be resolved as part of the							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				information contained in higher-level labels.	solution to all discrepancies associated with panels C252 A thru D.							
C-223	A	6.6.2.2(a)	RECORDER	Labels should he permanently mounted to prevent accidental removal.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-223	B	6.6.2.2(a)	RECORDER	Labels should be permanently mounted to prevent accidental removal.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-224	A	6.6.2.4(a)	RECORDER	Lahels should not obstruct any other information source.	Monticello will review this problem and find a way to affix hold/secure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-224	B	6.6.2.4(a)	RECORDER	Labels should not obstruct any other information source.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C-225		6.6.2.4(b)	RECORDER	Labels should not be obscured.	Monticello will review this problem and find a way to affix hold/socure cards so that they do not block the view of surrounding components, although the hold/secure cards may obscure labels associated with the component to which they are attached.	X						
C-226		6.6.3.4(b)	RECORDER	Symbols should be unique and easily distinguishable.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-227		6.6.4.2(a)	RECORDER	Labels should have all simple capital letters.	These HEDs will he resolved as part of the Control Room Re-labeling project.	X						
C-228	A	6.6.5.1(b)	RECORDER	Temporary lahels should not he substituted for standard labels and conform to good human engineering principles.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
C-228	B	6.6.5.1(b)	RECORDER	Temporary labels should not be substituted for standard labels and conform to good	The solution to these discrmpancies will he resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				human engineering principles.								
E-8		6.6.1.1	SWITCH	Power switch to wide range gas monitor poorly labelled, causing inadvertent power loss.	This component was fixed earlier in the review, after the HED was written. The component has been subsequently reviewed.							
E-10		6.4.2.1		Control movements should conform to population stereotype (right = increase, left = decrease)	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with that specification.	X						
I-90		6.3.3.5(d)		Some alarm windows are "crowded" with text.	Monticello will change tbe ahbreviations and tho selection of terminology for the alarms as part of the alarm system redesign.							X
I-92		6.6.3.3(b)		Labels on the RHR system are inconsistent across equipment, or possibly misleading.	Monticello will develop a list of synonyms to establish the correct terminology that will be used for each piece of equipment or each plant function. This will be added to the Monticello Control Room Convention Specifications, along with the abbreviations.	X						
I-94		6.6.3.3(a)		Labelling changes or additions are not administratively controlled.	Monticello has developed a control room convention specification. This document will control all future control room labels. All existing labels will be reviewed/modified in the relabeling project.	X						
I-95		6.6.3.3(c)		Some values and setpoints in the procedures do not match the labels on the control boards.	The control room labeling project will address this problem. Administrative controls will be developed to control labels specifying setpoints/trip levels.	X						
I-96		6.6.3.3(a)		Control rooms terms should he administratively controlled ("inlet" vs. "supply," for example).	Monticello will develop a list of synonyms to establish tbe correct terminology that will be used for each piece of equipment or each plant function. This will be added to the Monticello Control Room Convention Specifications, along with the abhreviations.	X						
R-1		6.3.4.2(b)	ALARMS	Annunciator pushbuttons should have color/shading/demarcation or shape coding for easy recognition.	Monticello is evaluating the use of a "joy stick" device to acknowledge panel alarms.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R-3		6.6.1.2(a)(3)	J/T HANDLE	Component label should be used to identify each discrete panel or element. "PHASE SELECT" label does not specify related display.	Operators are trained in the operation of panel operation. No corrective actions will be taken.					X		
R-4		6.6.2.3(a)(1)	METER	Labels should be oriented horizontally. This information should be on the function labels.	This HED will be resolved as part of the control room re-labeling project.							X
R-5		6.5.1.4(b)	TREND RECORDER	Avoid extraneous information ("NUCLEAR SAFETY RELATED").	The information listed on this recorder helps qualify the recorder. No corrective action will be taken.					X		
R-6		6.6.3.3(c)	METER	There should he no mismatch between nomeclature used in procedures and that printed on the lahels (ie., "DG-12" not "DSL-GEN").	Monticello will correct this HED through the control room re-labeling project.							
R-7		6.5.3.2(a)(1)	J/T HANDLE	When meaning is not apparent, labeling must be provided. The single white light used for diesel generator is not identified.	Monticello will revise as per the convention spec, as part of a relabeling project. If there is any ambiguity for indicator meaning (different than color code), then a small text will be added.							X
R-15		6.3.3.3(a)	ALARM	There should be some kind of organization or functional grouping of the visual alarms.	This problem will be covered in the overall alarm system review.							X
R-18		6.3.3.4	ALARM	The label text should specify high or low. "ESW PRESSURE" is ambiguous.	This problem will be covered in the overall alarm system review.							X
R-19		6.4.4.3(h)	KEYSWITCH	Keyswitch should be repositioned so that the teeth are pointing upward upon	The key can be inserted only one way. The correct orientation of the key can be determined by observation. No corrective action is planned.					X		

HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
				insertion (off position).								
R-20		6.5.1.1(d)	METER	Listing the function of the meter on both panel name plate and on the instrument is redundant.	This redundant information will he removed as part of the control room relabeling project.					X		
R-22		6.5.3.2(a)(1)	J/T HANDLE	Label should identify the meaning of the amber indicator on these controls.	Operators are trained as to the meanings of light colors. The Monticello control room convention specification standardizes these lights. No corrective action will be taken.					X		
R-23		6.5.3.1(a)(1)	J/T HANDLE	Dual bulb or dual filament light assemblies should be used.	Monticello does not plan to add dual-filament hulbs nor add test switches for bulbs.					X		
R-24		6.5.1.6(c)(2)	THUMBSWITCH	Red, green, and amber should be reserved for applications with immediate safety ioplications.	Monticello will change all colors in the CR to conform with the Monticello convention specification. For applications that don't fit the convention spec, a neutral white light will be used.	X						
R-25		6.6.3.4(e)	J/T HANDLES	Avoid the use of roman numerals.	This HED will be corrected during the control room re-labeling project.							
R-26		6.6.3.8(a)	J/T HANDLE	The center control position should be identified.	This HED will be resolved as a result of the Monticello control room re-labeling project.							X
R-27		6.5.3.1(c)(2)	J/T HANDLE	A prevision should be made to prevent the interchange of indicator lenses.	Monticello will develep procedures for the correct replacement of lamps and lenses on indicators to solve this problem.				X			
R-28		6.4.4.5(d)	J/T HANDLE	This control should have a position pointer.	Monticello will correct this HED through compliance with the control room convention specification.	X						
R-31		6.4.2.1	THUMBSWITCH	Controls should not be inconsistant and confusing. "RESET" is to the left on NP-15 and to the right on NP-16.	Monticello will correct this inconsistency.	X						

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R-32		6.6.1.2(a)(3)	THUMBSWITCH	Labels should identify each control position.	This HED is a duplication of HED R26.							
R-33		6.6.4.1(c)	THUMBSWITCH	NP-19 should he a T-HANDLE (conventional practic for electric motor controls).	This deviation from Monticello Convetion Specification is acceptable because using a T-handle switch would project out over the sleping section of the panel possibly hampering other switch operation. No corrective actions will be taken.					X		
R-34		6.5.2.3(a)	METER	Zone markings should be used when there are defined operating ranges.	Monticello will apply the convention spec recommendations for zone markings, including the replacement of some inadequate zone markings already in place.							X
R-35		6.5.1.5(c)	METER	Scale graduation marks should follow 6.5.1.5(c).	Monticello will change the meter scale to comply with the Monticello control room convention specification.	X						
R-36		6.5.1.2(a)	METER	Scale units should be consistant with the level of precision and accuracy needed by the operators. (+)/(-) markings are needed.	This instrument reads reactor pressure. There is no negative pressure reading. The minus (-) sign is for failed instrument indication. No corrective action will be taken.					X		
R-37		6.5.1.4(c)	METER	Messages should he clear and brief.	Upon investigation, Monticello cannot find any problem witb these labels. No corrective action will be taken.					X		
R-38		6.6.3.8(a)		Convention Specifications state that the control should have a "NEUTRAL" position.	This HED will be resolved as part of the Control Room Relabelling Project.	X						
R-40		6.5.1.5(e)	METER	Linear scales are preferable to non-linear scales.	Monticello will use additional training to solve this problem. Log scales are necessary because of the wide range of these devices.			X				
S-33		6.3.3.4(a)	ANNUNCIATORS	Annunciator tile legends sometimes too long or misspelled.	The alarm system review will address the proper annunciator text, based on the abbreviation list identified in the control room convention specification.	X						
S-34		6.6.3.4(d)	—	Inconsistent tile legend abbreviations. Use of same	The control room convention specifications will serve as the hasis for correcting these deficiencies as part of the alarm system review.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO. CORRECT	ALREADY FIXED	PENDING
				abbreviations—use of different abbreviations for same meanings.								
S-35		6.3.3.5(a)(2)	—	Letter heights on tiles are not uniform.	The control room convention specifications will serve as the basis for correcting these deficiencies as part of the alarm system review.							X
S-36		6.3.3.5(b)(2)	—	Tile type styles are not consistent.	The control room convention specifications will serve as the basis for correcting these deficiencies as part of the alarm system review.							X
S-37		6.3.3.5(b)(3)	—	Mixed upper and lower case lettering on some tiles.	The control room convention specifications will serve as the basis for correcting these deficiencies as part of the alarm system review.							X
S-38		6.3.3.5(d)(4)	—	Space between characters on annunciator tiles less than one stroke width in some cases.	The control room convention specifications will serve as the basis for correcting these deficiencies as part of the alarm system review.							X
S-39		6.3.3.5(d)(6)	—	Minimum space between words is sometimes less than one character width on annunciator tiles.	The control room convention specifications will serve as the basis for correcting these deficiencies as part of the alarm system review.							X
T-6	A	6.4.2.1	SWITCH	Control movements should conform to population stereotypes.	Monticello will review these components against the Monticello convention spec and make changes as necessary to conform with specification.	X						
T-6	B	6.4.2.1	SWITCH	Control movements should conform to population stereotypes.	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
T-20	A	6.6.1.1		Controls, displays and other equipment should be labelled appropriately.	These HEDs will be resolved as part of the Control Room Re-labeling project.	X						
T-20	B	6.6.1.1		Controls, displays and other equipment should be labelled appropriately.	The solution to these discrepancies will be resolved as part of tbe solution to all discrepancies associated with panels C252 A thru D.							X

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HED CODE	CORR CODE	NUREG-0700 GUIDELINE	COMPONENT TYPE	DESCRIPTION	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T-24		6.5.1.4(k)	METER, RECORDER	Recorder design should allow data to be viewed through the window without opening the door.	Monticello will review the options for presenting the recorder legend on multipoint recorders so that the data is not blocked. The convention spec shows an option for locating this information to prevent the window being blocked.							X
T-27		6.5.1.6(d)		The meaning of a particular color should be consistent both within and among the various systems to which it is applied.	Monticello does not plan to change the red meter face on this component, as it is only used in testing and calibration purposes.					X		
T-29		6.5.2.3	METERS, RECORDERS	Zone markings should be used to show the operational implications of readings, when appropriate.	Monticello will apply the convention spec recommendations for zone markings.	X						

APPENDIX E
HUMAN ENGINEERING DISCREPANCY DESCRIPTIONS, COMPONENTS, AND RESOLUTIONS

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 1	6.5.2.2.(b)(1)	RECORDER	Pointer tip should extend to within 1/16 in. of, but not overlap, the smallest graduation on the scale.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 1	3	FR 10-143	RHR FLOW	L	M	H	M	4	A
A 1	3	LR 2-3-113	RPV LEVEL	L	M	H	H	4	A
A 1	4	CR 12-133	CLEANUP OUTLET CONDUCTIVITY	L	M	L	M	4	A
A 1	4	CR 12-144	CLEANUP INLET CONDUCTIVITY	L	M	L	M	4	A
A 1	4	FR 2-154	RECIRCULATION FLOW	L	M	L	L	4	A
A 1	4	FR 2544	DISCHARGE FLOW	L	M	L	L	4	A
A 1	4	PR 2994	DRYWELL & SUPPR CHBR PRESS	L	M	H	M	4	A
A 1	4	TR 2-167	RECIRC TEMPERATURES	L	M	M	M	4	A
A 1	4	TR 2-3-90	VESSEL SHELL & FLANGE	L	M	L	L	4	A
A 1	5	7-46A	APRM LOCAL POWER LEVEL	L	M	H	H	4	A
A 1	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	L	M	H	M	4	A
A 1	5	FPR 2-3-95	CORE DP/TOTAL CORE FLOW	L	M	L	L	4	A
A 1	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	L	M	M	M	4	A
A 1	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	L	M	M	L	4	A
A 1	5	NR 7-45	SOURCE RANGE MONITOR LEVEL	L	M	H	L	4	A
A 1	5	TRR-3	COMPUTER TREND	L	M	L	L	4	A
A 1	5	TRR-4	COMPUTER TREND	L	M	L	L	4	A
A 1	6	CR 1268	CONDENSATE CONDUCTIVITY	L	M	L	M	4	A
A 1	6	TR 1148A/B	FEEDWATER TEMPERATURE	L	M	M	L	4	A
A 1	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	M	M	M	4	A
A 1	7	PR 1176	TURB THROTTLE & INST.	L	M	H	L	4	A
A 1	7	SR 1715	SPEED-VALVE & BYPASS POSITION	L	M	M	L	4	A
A 1	7	TR 7998	TURBINE-GEN BEARING METAL TEMP	L	M	M	H	4	A
A 1	7	TRR-2	COMPUTER TREND	L	M	L	L	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 1	2	NR 17-152	OFFGAS RAD LEVEL	L	M	H	H	4	A
A 1	2	NR 17-353	CLSD COOL WTR/SERV WTR EFF RAD	L	M	H	M	4	A
A 1	2	NR 17-358	DISCHARGE CANAL MONITOR	L	M	H	H	4	A
A 1	2	RR 7433	LIQ PROCESS RAD	L	M	M	H	4	A
A 1	2	RR 7993	DRYWELL CAM	L	M	H	M	4	A
A 1	20	TR 1712	COND & RFP BRGS TEMP	L	M	L	H	4	A
A 1	21	TR 2-184-26	M-G SET WINDINGS	L	M	M	H	4	A
A 1	25	TR 1720	DRYWELL COOLER TEMP RECORDER	L	M	H	M	4	A
A 1	31	TR 1713	GENERATOR STATOR H2 GAS	L	M	L	M	4	A
A 1	257	RR 7858A	STACK NOBLE GAS	L	M	H	H	4	A
A 1	257	RR 7858C	STACK NOBLE GAS	L	M	H	H	4	A
A 1	257	RR 7859A	RBV NOBLE GAS	L	M	H	H	4	A
A 1	257	RR 7859C	RBV NOBLE GAS	L	M	H	H	4	A
A 1	258	RR 7858B	STACK NOBLE GAS	L	M	H	H	4	A
A 1	258	RR 7858D	STACK NOBLE GAS	L	M	H	H	4	A
A 1	258	RR 7859B	RBV NOBLE GAS	L	M	H	H	4	A
A 1	258	RR 7859D	RBV NOBLE GAS	L	M	H	H	4	A
A 1	259	AR 4018A	O2/H2 CONCENTRATION CH A	L	M	M	M	4	A
A 1	260	AR 4018B	O2/H2 CONCENTRATION CH B	L	M	M	M	4	A
A 1	252A	FR 7676	OFFGAS FLOW TO STACK	L	M	L	H	4	B
A 1	252B	FR 7492A	OFFGAS FLOW	L	M	L	L	4	B
A 1	252C	FR 7492B	OFFGAS FLOW	L	M	L	L	4	B
A 1	252C	FR 7508B	#12 EDUCTOR STEAM FLOW & OUTLET	L	M	M	L	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 1	A	Monticello will correct this problem and develop a standard PM for the problem: the procedure will include trimming the size of the pointer and/or bending the arm to which the pointer is attached.	X			X			
A I	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 2	6.1.1.3(f)(1)		Minimum separation of 50" between equipment and opposing surfaces.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 2	3		--	L	L	-	-	4	
A 2	2		--	L	L	-	-	4	
A 2	10		--	L	L	-	-	4	
A 2	11		--	L	L	-	-	4	
A 2	13		--	L	L	-	-	4	
A 2	15		--	L	L	-	-	4	
A 2	16		--	L	L	-	-	4	
A 2	17		--	L	L	-	-	4	
A 2	20		--	L	L	-	-	4	
A 2	21		--	L	L	-	-	4	
A 2	37		--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 2		This HED lists the panels that are placed in narrow aisles. No corrective action is planned. No problems associated with maintenance or operations activities have been reported.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 3	6.1.2.5(a)		Controls should be no higher than 70" above the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 3	15	16A-S53A	GRP 1 ISOL CH A-1	L	L	L	M	5	A
A 3	15	16A-S53C	GRP 1 ISOL CH A-2	L	L	L	M	5	A
A 3	15	16A-S54A	GRP 2-3 ISOL CH A-1	L	L	L	M	5	A
A 3	15	16A-S54C	GRP 2-3 ISOL CH A-2	L	L	L	M	5	A
A 3	15	5A-CB1A	RX PROTECTION AC MG SET POWER	L	L	H	L	4	A
A 3	15	5A-S12C	MSIV SCRAM CH A-2	L	L	L	M	5	A
A 3	15	5A-S13A	TSV SCRAM CH A-1	L	L	L	M	5	A
A 3	15	5A-S13C	TSV SCRAM CH A-2	L	L	L	M	5	A
A 3	16	10-43	CR 10-43 INFO	L	L	H	H	4	A
A 3	16	14-43	CR 14-43 INFO	L	L	H	H	4	A
A 3	16	14-47	CR 14-47 INFO	L	L	H	H	4	A
A 3	16	18-43	CR 18-43 INFO	L	L	H	H	4	A
A 3	16	18-47	CR 18-47 INFO	L	L	H	H	4	A
A 3	16	22-43	CR 22-43 INFO	L	L	H	H	4	A
A 3	16	22-47	CR 22-47 INFO	L	L	H	H	4	A
A 3	16	22-51	CR 22-51 INFO	L	L	H	H	4	A
A 3	16	26-43	CR 26-43 INFO	L	L	H	H	4	A
A 3	16	26-47	CR 26-47 INFO	L	L	H	H	4	A
A 3	16	26-51	CR 26-51 INFO	L	L	H	H	4	A
A 3	16	30-43	CR 30-43 INFO	L	L	H	H	4	A
A 3	16	30-47	CR 30-47 INFO	L	L	H	H	4	A
A 3	16	30-51	CR 30-51 INFO	L	L	H	H	4	A
A 3	16	34-43	CR 34-43 INFO	L	L	H	H	4	A
A 3	16	34-47	CR 34-47 INFO	L	L	H	H	4	A
A 3	16	38-43	CR 38-43 INFO	L	L	H	H	4	A
A 3	16	38-47	CR 38-47 INFO	L	L	H	H	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 3	16	42-43	CR 42-43 INFO	L	L	H	H	4	A
A 3	17	16A-S53B	GRP 1 ISOL CH B-1	L	L	L	M	5	A
A 3	17	16A-S53D	GRP 1-ISOL CH B-2	L	L	L	M	5	A
A 3	17	16A-S54B	GRP 2-3 ISOL CH B-1	L	L	L	M	5	A
A 3	17	16A-S54D	GRP 2-3 ISOL CH B-2	L	L	L	M	5	A
A 3	17	5A-CB1B	RX PROTECTION AC MG SET POWER	L	L	H	L	4	A
A 3	17	5A-S12B	MSIV SCRAM CH B-1	L	L	L	M	5	A
A 3	17	5A-S12D	MSIV SCRAM CH B-2	L	L	L	M	5	A
A 3	17	5A-S13B	TSV SCRAM CH B-1	L	L	L	M	5	A
A 3	17	5A-S13D	TSV SCRAM CH B-2	L	L	L	M	5	A
A 3	24A	(ANNUN ACKNOWLEDGE)	ACKNOWLEDGE PUSHBUTTON	L	L	M	L	5	B
A 3	24A	(ANNUN LAMP TEST)	LAMP TEST PUSHBUTTON	L	L	M	L	5	B
A 3	24A	(ANNUN OP TEST)	OPERATION TEST PUSHBUTTON	L	L	M	L	5	B
A 3	24B	(ANNUN ACKNOWLEDGE)	ACKNOWLEDGE PUSHBUTTON	L	L	M	L	5	B
A 3	24B	(ANNUN LAMP TEST)	LAMP TEST PUSHBUTTON	L	L	M	L	5	B
A 3	24B	(ANNUN OP TEST)	OPERATION TEST PUSHBUTTON	L	L	M	L	5	B
A 3	25	HS 1427	COOLING WATER	L	L	H	M	4	C
A 3	25	HS 42-3312	FAN CONTROL	L	L	H	M	4	C
A 3	25	HS 42-3313	FAN CONTROL	L	L	H	M	4	C
A 3	25	HS 42-4312	FAN CONTROL	L	L	H	M	4	C
A 3	25	HS 42-4313	FAN CONTROL	L	L	H	M	4	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 3	A	Generally, these are infrequently used controls. On panels C16, C15, and C17, these controls are used during surveillance testing, which is infrequent. Monticello may evaluate the advisability of establishing minimum height criteria for operations personnel.					X		
A 3	B	Annunciator acknowledge pushbuttons: No change in location is planned.					X		

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 3	C	Panel C25 controls: this equipment is in continuous operation or in auto standby. No movement of these controls is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 4	6.8.3.3		Mirror-imaging should not be allowed.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 4	15	16A-S53A	GRP 1 ISOL CH A-1	L	H	L	M	3	
A 4	15	16A-S53C	GRP 1 ISOL CH A-2	L	H	L	M	3	
A 4	15	16A-S54A	GRP 2-3 ISOL CH A-1	L	H	L	M	3	
A 4	15	16A-S54C	GRP 2-3 ISOL CH A-2	L	H	L	M	3	
A 4	15	5A-CB1A	RX PROTECTION AC MG SET POWER	L	H	H	L	3	
A 4	15	5A-S12C	MSIV SCRAM CH A-2	L	H	L	M	3	
A 4	15	5A-S13A	TSV SCRAM CH A-1	L	H	L	M	3	
A 4	15	5A-S13C	TSV SCRAM CH A-2	L	H	L	M	3	
A 4	17	16A-S53B	GRP 1 ISOL CH B-1	L	H	L	M	3	
A 4	17	16A-S53D	GRP 1-ISOL CH B-2	L	H	L	M	3	
A 4	17	16A-S54B	GRP 2-3 ISOL CH B-1	L	H	L	M	3	
A 4	17	16A-S54D	GRP 2-3 ISOL CH B-2	L	H	L	M	3	
A 4	17	5A-CB1B	RX PROTECTION AC MG SET POWER	L	H	H	L	3	
A 4	17	5A-S12B	MSIV SCRAM CH B-1	L	H	L	M	3	
A 4	17	5A-S12D	MSIV SCRAM CH B-2	L	H	L	M	3	
A 4	17	5A-S13B	TSV SCRAM CH B-1	L	H	L	M	3	
A 4	17	5A-S13D	TSV SCRAM CH B-2	L	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 4		Monticello will change the configuration of these controls to eliminate the mirror-image configuration.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 5	6.5.3.1(c)		System status should be shown by illumination, not the absence of illumination.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 5	2	(OFFGAS/STKGAS MON)	OFFGAS/STKGAS RAD MON POWER	L	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 5		Monticello does not plan to add another component to indicate both states of the equipment. This light is normally illuminated. If the light is out the control room operator would assume the bulb has failed and investigate, or would know via the shift Turn Over Checklist that this system was not in service.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 6	6.1.2.5(a)		Controls should be higher than 34" above the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 6	2	(OFFGAS/STKGAS MON)	OFFGAS/STKGAS RAD MON POWER	L	L	H	H	4	
A 6	13	(FLUX AMP (S1))	FLUX AMPLIFIER METER SELECTOR SW	L	L	L	L	5	B
A 6	13	(FLUX AMP (S2))	FLUX AMPLIFIER RECORDER SELE SW	L	L	L	L	5	B
A 6	13	(VLV CNTL CL 1(S1))	KEYED SWITCH ON VALVE CONTROL	L	L	H	H	4	B
A 6	13	(VLV CNTL CL 1(S3))	PURGE SWITCH ON VALVE CNTL 1 & 2	L	L	H	H	4	B
A 6	13	(VLV CNTL CL 2(S2))	KEYED SWITCH ON VALVE CONTROL	L	L	H	H	4	B
A 6	13	(VLV CNTL CL 3(S1))	KEYED SWITCH ON VALVE CONTROL	L	L	H	H	4	B
A 6	13	(VLV CNTL CL 3(S3))	PURGE SWITCH ON VALVE CNTL 3	L	L	H	H	4	B
A 6	252A	(K1-TK11)	OG HOLDUP TK#11 DISCH PERMISSIVE	L	L	L	L	5	C
A 6	252A	(K2-TK12)	OG HOLDUP TK#12 DISCH PERMISSIVE	L	L	L	L	5	C
A 6	252A	(K3-TK13)	OG HOLDUP TK#13 DISCH PERMISSIVE	L	L	L	L	5	C
A 6	252A	(K4-TK14)	OG HOLDUP TK#14 DISCH PERMISSIVE	L	L	L	L	5	C
A 6	252A	(K5-TK15)	OG HOLDUP TK#15 DISCH PERMISSIVE	L	L	L	L	5	C
A 6	252A	HS 105	EXH FANS COMPR/STOR BLDG	L	L	L	L	5	C
A 6	252A	TS 7697	RECOMBINER BED TEMP SELECTOR SW	L	L	L	L	5	C
A 6	252B	FCS 7490AB	OFFGAS INLET	L	L	L	L	5	C
A 6	252B	FCS 7508A	STEAM TO EDUCTOR FCV-7508A	L	L	M	L	5	C
A 6	252B	FCS 7557A	OFFGAS OUTLET FCV-7557A	L	L	M	L	5	C
A 6	252B	HS-101A	RECOMBINER 11 HEATER	L	L	L	L	5	C
A 6	252B	HS-201A	H2 MASS FLOW	L	L	L	L	5	C
A 6	252B	HS-202A	INLET PRESS	L	L	L	L	5	C
A 6	252B	HS-203A	STM FLOW	L	L	L	L	5	C
A 6	252B	HS-301A	INLET TEMP	L	L	L	L	5	C
A 6	252B	HS-7575A	AIR SUPPLEMENT SV-7575A	L	L	L	L	5	C
A 6	252B	TSA	TRAIN A TEST	L	L	L	L	5	C
A 6	252B	TSS-A	TRAIN SELECTOR SW TRAIN A	L	L	L	L	5	C

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 6	252C	FCS-7490BB	OFFGAS INLET FCV-7489B	L	L	L	L	5	C
A 6	252C	FCS-7508B	STEAM TO EDUCTOR FCV-7508B	L	L	M	L	5	C
A 6	252C	FCS-7557B	OFFGAS OUTLET FCV-7557B	L	L	M	L	5	C
A 6	252C	HS-101B	RECOMBINER 12 HEATER	L	L	L	L	5	C
A 6	252C	HS-201B	H2 MASS FLOW	L	L	L	L	5	C
A 6	252C	HS-202B	INLET PRESS	L	L	L	L	5	C
A 6	252C	HS-203B	STM FLOW	L	L	L	L	5	C
A 6	252C	HS-301B	INLET TEMP	L	L	L	L	5	C
A 6	252C	HS-7575B	AIR SUPPLEMENT SV-7575B	L	L	L	L	5	C
A 6	252C	TSB	TRAIN B TEST	L	L	L	L	5	C
A 6	252C	TSS-B	TRAIN SELECTOR SW TRAIN B	L	L	L	L	5	C
A 6	252D	FIY 7504A	#11 EDUCTOR STEAM FLOW	L	L	L	L	5	C
A 6	252D	FIY 7504B	#12 EDUCTOR STEAM FLOW	L	L	L	L	5	C
A 6	252D	FIY 7505A	#11 EDUCTOR STEAM FLOW	L	L	L	L	5	C
A 6	252D	FIY 7505B	#12 EDUCTOR STEAM FLOW	L	L	L	L	5	C
A 6	31	(GATE (OPEN))	GATE (OPEN) PUSHBUTTON	L	L	L	L	5	D
A 6	31	(GATE)	GATE POSITION SELECTOR SWITCH	L	L	L	L	5	D
A 6	31	286/G	GENERATOR LOCK-OUT	L	L	L	M	5	E
A 6	31	286/T	TURBINE LOCK-OUT	L	L	L	M	5	E
A 6	20	62C/OI		L	L	L	L	5	F
A 6	20	96/OI		L	L	L	L	5	F
A 6	20	EHT/OI		L	L	L	L	5	F
A 6	20	HV/OI		L	L	L	L	5	F
A 6	20	MSTH/OI		L	L	L	L	5	F
A 6	20	RHWL/OI		L	L	L	L	5	F
A 6	20	VTS/OI		L	L	L	L	5	F

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 6	A	These controls are not associated with a safety system and no correction is planned.					X		

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A	6 B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
A	6 C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
A	6 D	These controls will be removed.	X						
A	6 E	Monticello does not plan to move these controls. They are infrequently used controls. Their location is borderline with respect to location criteria. No problems have been identified with their use.					X		
A	6 F	These devices are Main Generator Protection Relays, operators interface with these relays for trouble shooting. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 8	6.3.1.1		Annunciators should not be placed with status indication.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 8	10	17-150A	OFF GAS CH 1	L	M	H	H	4	
A 8	10	17-150B	OFF GAS CH 2	L	M	H	H	4	
A 8	10	17-251A	MAIN STEAM LINE CHANNEL A	L	M	H	H	4	
A 8	10	17-251B	MAIN STEAM LINE CHANNEL B	L	M	H	H	4	
A 8	10	17-251C	MAIN STEAM LINE CHANNEL C	L	M	H	H	4	
A 8	10	17-251D	MAIN STEAM LINE CHANNEL D	L	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 8		Monticello does not intend to change this device. This is a typical design for this type of device. All instruments cannot be located on the front panel. When a trip signal is generated by these devices, two things happens. (1) A trip signal is sent to a front panel alarm window that directs the operator to this panel. (2) A light is illuminated on the affected instrument to assist the operator in quickly identifying the unit that is tripped and what trip has been actuated. These lights are backed up by an instrument meter that indicates the actual signal being generated by the device.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 9	6.5.3.1(b)	LIGHTS	Lights should not appear to off when glowing, nor glowing when actually off.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 9	11	18-53A	POWER SUPPLY AREA MONITOR					C	
A 9	11	18-53B	POWER SUPPLY AREA MONITOR					C	
A 9	11	18-53C	POWER SUPPLY AREA MONITOR					C	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 9		Monticello will develop a standard for bulb wattage and lenses to use in the convention specification. This will also become a standard for the preventative maintenance procedures, i.e., replacing lenses.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 10	6.1.1.3(c)		Operators should be able to get to any workstation without having to overcome obstacles

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 10	20		--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 10		This problem includes the ladder in front of a control panel that blocks access. Monticello feels that changes planned, including the new operators' workstation, should allow for better storage of the rolling ladder.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 12	6.8.1.1(a)		Rad monitors and recorders should be in adjacent positions. Operators have to travel between C02 (recorders) & C10/C11 (meters).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 12		(RAD MON & RECORDRS)	(PANELS C02, C10, C11)	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 12		This HED references movement between panels C2, C10, and C11. The problem arises from activation of spring-loaded toggleswitches. System modifications will replace the toggle switches with keylock switches. No further corrective actions are planned.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 13	6.1.1.3(f)(3)		Minimum separation of 8 feet between opposing panels where more than one person must work.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 13		25	--	L	L	-	-	4	
A 13		36	--	L	L	-	-	4	
A 13		24B	--	L	L	-	-	4	
A 13		263A		L	L	-	-	4	
A 13		264B		L	L	-	-	4	
A 13		291A	--	L	L	-	-	4	
A 13		291B	--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 13		No corrective action is planned, because no problems have been reported during maintenance and operations activities.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 14	6.1.2.5(b)(1)		Displays should be mounted lower than 70" from the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 14	20	WH-2	WATT-HOUR METER	M	H	L	L	4	
A 14	20	WR 7269	WIND SPEED/DIRECTION	M	H	H	H	2	
A 14	25	8033A	FAN INLET DAMP POSITION	M	H	H	M	2	
A 14	25	8033A1	DAMPER ADJUST CONTROL	M	H	M	M	3	
A 14	25	8033A1 (FAN)	FAN MOTOR AMPERAGE	M	H	H	M	2	
A 14	25	8033B	FAN INLET DAMPER POSITION	M	H	H	M	2	
A 14	25	8033B2	DAMPER ADJUST	M	H	H	M	2	
A 14	25	8033B2 (FAN)	FAN MOTOR AMPERAGE	M	H	H	M	2	
A 14	25	8033C	FAN INLET DAMP POSITION	M	H	H	M	2	
A 14	25	8033C3	DAMPER ADJUST	M	H	M	M	3	
A 14	25	8033C3 (FAN)	FAN MOTOR AMPERAGE	M	H	H	M	2	
A 14	25	8033D	FAN INLET DAMP POS	M	H	H	M	2	
A 14	25	8033D4	DAMPER ADJUST CONTROL	M	H	M	M	3	
A 14	25	8033D4 (FAN)	FAN MOTOR AMPERAGE	M	H	H	M	2	
A 14	25	8045F	HIGH FLOW	M	H	H	M	2	
A 14	36	(BYPASSED CL 11)	BYPASSED CL 11	M	H	M	L	3	
A 14	36	(BYPASSED CL 12)	BYPASSED CL 12	M	H	M	L	3	
A 14	36	(BYPASSED CL 13)	BYPASSED CL 13	M	H	M	L	3	
A 14	36	(BYPASSED CL 14)	BYPASSED CL 14	M	H	M	L	3	
A 14	36	(BYPASSED CL 15)	BYPASSED CL 15	M	H	M	L	3	
A 14	36	(BYPASSED CL 16)	BYPASSED CL 16	M	H	M	L	3	
A 14	36	(BYPASSED CL 17)	BYPASSED CL 17	M	H	M	L	3	
A 14	36	(BYPASSED CL 18)	BYPASSED CL 17	M	H	M	L	3	
A 14	36	(BYPASSED CL 21)	BYPASSED CL 21	M	H	M	L	3	
A 14	36	(BYPASSED CL 22)	BYPASSED CL 22	M	H	M	L	3	
A 14	36	(BYPASSED CL 23)	BYPASSED CL 23	M	H	M	L	3	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 14	36	(BYPASSED CL 24)	BYPASSED CL 24	M	H	M	L	3	
A 14	37	(APRM CL1:1B-28-45)	APRM CHANNEL 1:1B-28-45	M	H	M	M	3	
A 14	37	(APRM CL1:2B-12-29)	APRM CHANNEL 1:2B-12-29	M	H	M	M	3	
A 14	37	(APRM CL1:2C-20-37)	APRM CHANNEL 1:2C-20-37	M	H	M	M	3	
A 14	37	(APRM CL1:3A-36-37)	APRM CHANNEL 1:3A-36-37	M	H	M	M	3	
A 14	37	(APRM CL1:3B-44-29)	APRM CHANNEL 1:3B-44-29	M	H	M	M	3	
A 14	37	(APRM CL1:3D-28-29)	APRM CHANNEL 1:3D-28-29	M	H	M	M	3	
A 14	37	(APRM CL1:4A-20-21)	APRM CHANNEL 1:4A-20-21	M	H	M	M	3	
A 14	37	(APRM CL1:4B-28-13)	APRM CHANNEL 1:4B-28-13	M	H	M	M	3	
A 14	37	(APRM CL1:4D-12-13)	APRM CHANNEL 1:4D-12-13	M	H	M	M	3	
A 14	37	(APRM CL1:5C-36-21)	APRM CHANNEL 1:5C-36-21	M	H	M	M	3	
A 14	37	(APRM CL1:BYPASS)	APRM CHANNEL 1:BYPASS	M	H	M	M	3	
A 14	37	(APRM CL1:DNSCL)	APRM CHANNEL 1:DNSCL	M	H	M	M	3	
A 14	37	(APRM CL1:HI-HI)	APRM CHANNEL 1:HI-HI	M	H	M	M	3	
A 14	37	(APRM CL1:HIGH)	APRM CHANNEL 1:HIGH	M	H	M	M	3	
A 14	37	(APRM CL1:INOP)	APRM CHANNEL 1:INOP	M	H	M	M	3	
A 14	37	(APRM CL2:1C-28-45)	APRM CHANNEL 2:1C-28-45	M	H	M	M	3	
A 14	37	(APRM CL2:2C-12-29)	APRM CHANNEL 2:2C-12-29	M	H	M	M	3	
A 14	37	(APRM CL2:2D-20-37)	APRM CHANNEL 2:2D-20-37	M	H	M	M	3	
A 14	37	(APRM CL2:3A-28-29)	APRM CHANNEL 2:3A-28-29	M	H	M	M	3	
A 14	37	(APRM CL2:3B-36-37)	APRM CHANNEL 2:3B-36-37	M	H	M	M	3	
A 14	37	(APRM CL2:3C-44-29)	APRM CHANNEL 2:3C-44-29	M	H	M	M	3	
A 14	37	(APRM CL2:4A-12-13)	APRM CHANNEL 2:4A-12-13	M	H	M	M	3	
A 14	37	(APRM CL2:4B-20-37)	APRM CHANNEL 2:4B-20-37	M	H	M	M	3	
A 14	37	(APRM CL2:4C-28-13)	APRM CHANNEL 2:4C-28-13	M	H	M	M	3	
A 14	37	(APRM CL2:5D-36-21)	APRM CHANNEL 2:5D-36-21	M	H	M	M	3	
A 14	37	(APRM CL2:BYPASS)	APRM CHANNEL 2:BYPASS	M	H	M	M	3	
A 14	37	(APRM CL2:DNSCL)	APRM CHANNEL 2:DNSCL	M	H	M	M	3	
A 14	37	(APRM CL2:HI-HI)	APRM CHANNEL 2:HI-HI	M	H	M	M	3	
A 14	37	(APRM CL2:HIGH)	APRM CHANNEL 2:HIGH	M	H	M	M	3	
A 14	37	(APRM CL2:INOP)	APRM CHANNEL 2:INOP	M	H	M	M	3	
A 14	37	(APRM CL3:1D-28-45)	APRM CHANNEL 3:1D-28-45	M	H	M	M	3	
A 14	37	(APRM CL3:2A-20-37)	APRM CHANNEL 3:2A-20-37	M	H	M	M	3	
A 14	37	(APRM CL3:2D-12-29)	APRM CHANNEL 3:2D-12-29	M	H	M	M	3	
A 14	37	(APRM CL3:3B-28-29)	APRM CHANNEL 3:3B-28-29	M	H	M	M	3	
A 14	37	(APRM CL3:3C-36-37)	APRM CHANNEL 3:3C-36-37	M	H	M	M	3	
A 14	37	(APRM CL3:3D-44-29)	APRM CHANNEL 3:3D-44-29	M	H	M	M	3	

A 14 37	(APRM CL3:4B-12-13)	APRM CHANNEL 3:4B-12-13	M	H	M	M	3
A 14 37	(APRM CL3:4C-20-21)	APRM CHANNEL 3:4C-20-21	M	H	M	M	3
A 14 37	(APRM CL3:4D-28-13)	APRM CHANNEL 3:4D-38-13	M	H	M	M	3
A 14 37	(APRM CL3:5A-36-21)	APRM CHANNEL 3:5A-36-21	M	H	M	M	3
A 14 37	(APRM CL3:BYPASS)	APRM CHANNEL 3:BYPASS	M	H	M	M	3
A 14 37	(APRM CL3:DNSCL)	APRM CHANNEL 3:DNSCL	M	H	M	M	3
A 14 37	(APRM CL3:HI-HI)	APRM CHANNEL 3:HI-HI	M	H	M	M	3
A 14 37	(APRM CL3:HIGH)	APRM CHANNEL 3:HIGH	M	H	M	M	3
A 14 37	(APRM CL3:INOP)	APRM CHANNEL 3:INOP	M	H	M	M	3
A 14 37	(APRM CL4:1D-20-45)	APRM CHANNEL 4:1D-20-45	M	H	M	M	3
A 14 37	(APRM CL4:2A-12-37)	APRM CHANNEL 4:2A-12-37	M	H	M	M	3
A 14 37	(APRM CL4:2B-36-45)	APRM CHANNEL 4:2B-36-45	M	H	M	M	3
A 14 37	(APRM CL4:3A-44-37)	APRM CHANNEL 4:3A-44-37	M	H	M	M	3
A 14 37	(APRM CL4:3B-20-29)	APRM CHANNEL 4:3B-20-29	M	H	M	M	3
A 14 37	(APRM CL4:3C-28-37)	APRM CHANNEL 4:3C-28-37	M	H	M	M	3
A 14 37	(APRM CL4:3D-04-29)	APRM CHANNEL 4:3D-04-29	M	H	M	M	3
A 14 37	(APRM CL4:4A-28-21)	APRM CHANNEL 4:4A-28-21	M	H	M	M	3
A 14 37	(APRM CL4:4C-12-21)	APRM CHANNEL 4:4C-12-21	M	H	M	M	3
A 14 37	(APRM CL4:4D-36-29)	APRM CHANNEL 4:4D-36-29	M	H	M	M	3
A 14 37	(APRM CL4:5C-44-21)	APRM CHANNEL 4:5C-44-21	M	H	M	M	3
A 14 37	(APRM CL4:5D-20-13)	APRM CHANNEL 4:5D-20-13	M	H	M	M	3
A 14 37	(APRM CL4:6B-36-13)	APRM CHANNEL 4:6B-36-13	M	H	M	M	3
A 14 37	(APRM CL4:6C-28-05)	APRM CHANNEL 4:6C-28-05	M	H	M	M	3
A 14 37	(APRM CL4:BYPASS)	APRM CHANNEL 4:BYPASS	M	H	M	M	3
A 14 37	(APRM CL4:DNSCL)	APRM CHANNEL 4:DNSCL	M	H	M	M	3
A 14 37	(APRM CL4:HI-HI)	APRM CHANNEL 4:HI-HI	M	H	M	M	3
A 14 37	(APRM CL4:HIGH)	APRM CHANNEL 4:HIGH	M	H	M	M	3
A 14 37	(APRM CL4:INOP)	APRM CHANNEL 4:INOP	M	H	M	M	3
A 14 37	(APRM CL5:1A-20-45)	APRM CHANNEL 5:1A-20-45	M	H	M	M	3
A 14 37	(APRM CL5:2B-12-37)	APRM CHANNEL 5:2B-12-37	M	H	M	M	3
A 14 37	(APRM CL5:2C-36-45)	APRM CHANNEL 5:2C-36-45	M	H	M	M	3
A 14 37	(APRM CL5:3A-04-29)	APRM CHANNEL 5:3A-04-29	M	H	M	M	3
A 14 37	(APRM CL5:3B-44-37)	APRM CHANNEL 5:3B-44-37	M	H	M	M	3
A 14 37	(APRM CL5:3C-20-29)	APRM CHANNEL 5:3C-20-29	M	H	M	M	3
A 14 37	(APRM CL5:3D-28-37)	APRM CHANNEL 5:3D-28-37	M	H	M	M	3
A 14 37	(APRM CL5:4A-36-29)	APRM CHANNEL 5:4A-36-29	M	H	M	M	3
A 14 37	(APRM CL5:4B-28-21)	APRM CHANNEL 5:4B-28-21	M	H	M	M	3
A 14 37	(APRM CL5:4D-12-21)	APRM CHANNEL 5:4D-12-21	M	H	M	M	3
A 14 37	(APRM CL5:5A-20-13)	APRM CHANNEL 5:5A-20-13	M	H	M	M	3
A 14 37	(APRM CL5:5D-44-21)	APRM CHANNEL 5:5D-44-21	M	H	M	M	3
A 14 37	(APRM CL5:6C-36-13)	APRM CHANNEL 5:6C-36-13	M	H	M	M	3
A 14 37	(APRM CL5:6D-28-05)	APRM CHANNEL 5:6D-28-05	M	H	M	M	3
A 14 37	(APRM CL5:BYPASS)	APRM CHANNEL 5:BYPASS	M	H	M	M	3
A 14 37	(APRM CL5:DNSCL)	APRM CHANNEL 5:DNSCL	M	H	M	M	3

A	14	37	(APRM CL5:HI-HI)	APRM CHANNEL 5:HI-HI	M	H	M	M	3
A	14	37	(APRM CL5:HIGH)	APRM CHANNEL 5:HIGH	M	H	M	M	3
A	14	37	(APRM CL5:INOP)	APRM CHANNEL 5:INOP	M	H	M	M	3
A	14	37	(APRM CL6:1B-20-45)	APRM CHANNEL 6:1B-20-45	M	H	M	M	3
A	14	37	(APRM CL6:2C-12-37)	APRM CHANNEL 6:2C-12-37	M	H	M	M	3
A	14	37	(APRM CL6:2D-36-45)	APRM CHANNEL 6:2D-36-45	M	H	M	M	3
A	14	37	(APRM CL6:3A-28-37)	APRM CHANNEL 6:3A-28-37	M	H	M	M	3
A	14	37	(APRM CL6:3B-04-29)	APRM CHANNEL 6:3B-04-29	M	H	M	M	3
A	14	37	(APRM CL6:3C-44-37)	APRM CHANNEL 6:3C-44-37	M	H	M	M	3
A	14	37	(APRM CL6:3D-20-29)	APRM CHANNEL 6:3D-20-29	M	H	M	M	3
A	14	37	(APRM CL6:4A-12-21)	APRM CHANNEL 6:4A-12-21	M	H	M	M	3
A	14	37	(APRM CL6:4B-30-29)	APRM CHANNEL 6:4B-30-29	M	H	M	M	3
A	14	37	(APRM CL6:4C-28-21)	APRM CHANNEL 6:4C-28-21	M	H	M	M	3
A	14	37	(APRM CL6:5A-44-21)	APRM CHANNEL 6:5A-44-21	M	H	M	M	3
A	14	37	(APRM CL6:5B-20-13)	APRM CHANNEL 6:5B-20-13	M	H	M	M	3
A	14	37	(APRM CL6:6A-28-05)	APRM CHANNEL 6:6A-28-05	M	H	M	M	3
A	14	37	(APRM CL6:6D-36-13)	APRM CHANNEL 6:6D-36-13	M	H	M	M	3
A	14	37	(APRM CL6:BYPASS)	APRM CHANNEL 6:BYPASS	M	H	M	M	3
A	14	37	(APRM CL6:DNSCL)	APRM CHANNEL 6:DNSCL	M	H	M	M	3
A	14	37	(APRM CL6:HI-HI)	APRM CHANNEL 6:HI-HI	M	H	M	M	3
A	14	37	(APRM CL6:HIGH)	APRM CHANNEL 6:HIGH	M	H	M	M	3
A	14	37	(APRM CL6:INOP)	APRM CHANNEL 6:INOP	M	H	M	M	3
A	14	37	(FLOW CONV 1:COMP)	FLOW CONVERTER 1:COMPARATOR	M	H	M	M	3
A	14	37	(FLOW CONV 1:UPSCL/)	FLOW CONVERTER 1:UPSCL/INOP	M	H	M	M	3
A	14	37	(FLOW CONV 2:COMP)	FLOW CONVERTER 2:COMPARATOR	M	H	M	M	3
A	14	37	(FLOW CONV 2:UPSCL)	FLOW CONVERTER 2:UPSCL/INOP	M	H	M	M	3
A	14	37	(LPRM G1:LPRM BYP)	LPRM G1:LPRM BYPASSED	M	H	M	M	3
A	14	37	(LPRM GRP1:1A-28-45)	LPRM GRP1:1A-28-45	M	H	M	M	3
A	14	37	(LPRM GRP1:2A-12-29)	LPRM GRP1:2A-12-29	M	H	M	M	3
A	14	37	(LPRM GRP1:2B-20-37)	LPRM GRP1:2B-20-37	M	H	M	M	3
A	14	37	(LPRM GRP1:3A-44-29)	LPRM GRP1:3A-44-29	M	H	M	M	3
A	14	37	(LPRM GRP1:3C-28-29)	LPRM GRP1:3C-28-29	M	H	M	M	3
A	14	37	(LPRM GRP1:3D-36-37)	LPRM GRP1:3D-36-37	M	H	M	M	3
A	14	37	(LPRM GRP1:4A-28-13)	LPRM GRP1:4A-28-13	M	H	M	M	3
A	14	37	(LPRM GRP1:4C-12-13)	LPRM GRP1:4C-12-13	M	H	M	M	3
A	14	37	(LPRM GRP1:4D-20-21)	LPRM GRP1:4D-20-21	M	H	M	M	3
A	14	37	(LPRM GRP1:5B-36-21)	LPRM GRP1:5B-36-21	M	H	M	M	3
A	14	37	(LPRM GRP1:COMP)	LPRM GRP1:COMP	M	H	M	M	3
A	14	37	(LPRM GRP1:UPS/INOP)	LPRM GRP1:UPS/INOP	M	H	M	M	3
A	14	37	(LPRM GRP2:1C-20-45)	LPRM GRP2:1C-20-45	M	H	M	M	3
A	14	37	(LPRM GRP2:2A-36-45)	LPRM GRP2:2A-36-45	M	H	M	M	3
A	14	37	(LPRM GRP2:2D-12-37)	LPRM GRP2:2D-12-37	M	H	M	M	3
A	14	37	(LPRM GRP2:3A-20-29)	LPRM GRP2:3A-20-29	M	H	M	M	3
A	14	37	(LPRM GRP2:3B-28-37)	LPRM GRP2:3B-28-37	M	H	M	M	3

A	14	37	(LPRM GRP2:3C-04-29)	LPRM GRP2:3C-04-29	M	H	M	M	3
A	14	37	(LPRM GRP2:3D-44-37)	LPRM GRP2:3D-44-37	M	H	M	M	3
A	14	37	(LPRM GRP2:4B-12-21)	LPRM GRP2:4B-12-21	M	H	M	M	3
A	14	37	(LPRM GRP2:4C-36-29)	LPRM GRP2:4C-36-29	M	H	M	M	3
A	14	37	(LPRM GRP2:4D-28-21)	LPRM GRP2:4D-28-21	M	H	M	M	3
A	14	37	(LPRM GRP2:5B-44-21)	LPRM GRP2:5B-44-21	M	H	M	M	3
A	14	37	(LPRM GRP2:5C-20-13)	LPRM GRP2:5C-20-13	M	H	M	M	3
A	14	37	(LPRM GRP2:6A-36-13)	LPRM GRP2:6A-36-13	M	H	M	M	3
A	14	37	(LPRM GRP2:6B-28-05)	LPRM GRP2:6B-28-05	M	H	M	M	3
A	14	37	(LPRM GRP2:COMP)	LPRM GRP2:COMP	M	H	M	M	3
A	14	37	(LPRM GRP2:UPS/INOP)	LPRM GROUP 2:UPSCL/INOP	M	H	M	M	3
A	14	37	(RBM CL7:ALM REF S)	RBM CHANNEL 7:ALM REF S	M	H	M	M	3
A	14	37	(RBM CL7:ALM REF SE)	RBM CHANNEL 7:ALARM REF SET HI	M	H	M	M	3
A	14	37	(RBM CL7:BYPASS)	RBM CHANNEL 7:BYPASS	M	H	M	M	3
A	14	37	(RBM CL7:EDGE ROD S)	RBM CHANNEL 7:EDGE ROD S	M	H	M	M	3
A	14	37	(RBM CL7:HIGH)	RBM CHANNEL 7:HIGH	M	H	M	M	3
A	14	37	(RBM CL7:INOP)	RBM CHANNEL 7:INOP	M	H	M	M	3
A	14	37	(RBM CL7:NO BALANCE)	RBM CHANNEL 7:NO BALANCE	M	H	M	M	3
A	14	37	(RBM CL7:NO ROD SL)	RBM CHANNEL 7:NO ROD SL	M	H	M	M	3
A	14	37	(RBM CL7:RBM DNSCL)	RBM CHANNEL 7:RBM DNSCL	M	H	M	M	3
A	14	37	(RBM CL7:REF. DNSCL)	RBM CHANNEL 7:REF. DNSCL	M	H	M	M	3
A	14	37	(RBM CL7:ROD OUT IN)	RBM CHANNEL 7:ROD OUT IN	M	H	M	M	3
A	14	37	(RBM CL7:TRIP INH)	RBM CHANNEL 7:TRIP INH	M	H	M	M	3
A	14	37	(RBM CL8:ALM REF S)	RBM CHANNEL 8:ALM REF S	M	H	M	M	3
A	14	37	(RBM CL8:ALM REF SE)	RBM CHANNEL 8:ALARM REF SET LOW	M	H	M	M	3
A	14	37	(RBM CL8:BYPASS)	RBM CHANNEL 8:BYPASS	M	H	M	M	3
A	14	37	(RBM CL8:EDGE ROD S)	RBM CHANNEL 8:EDGE ROD S	M	H	M	M	3
A	14	37	(RBM CL8:HIGH)	RBM CHANNEL 8:HIGH	M	H	M	M	3
A	14	37	(RBM CL8:INOP)	RBM CHANNEL 8:INOP	M	H	M	M	3
A	14	37	(RBM CL8:NO BALANCE)	RBM CHANNEL 8:NO BALANCE	M	H	M	M	3
A	14	37	(RBM CL8:NO ROD SL)	RBM CHANNEL 8:NO ROD SL	M	H	M	M	3
A	14	37	(RBM CL8:RBM DNSCL)	RBM CHANNEL 8:RBM DNSCL	M	H	M	M	3
A	14	37	(RBM CL8:REF. DNSCL)	RBM CHANNEL 8:REF. DNSCL	M	H	M	M	3
A	14	37	(RBM CL8:ROD OUT IN)	RBM CHANNEL 8:ROD OUT IN	M	H	M	M	3
A	14	37	(RBM CL8:TRIP INH)	RBM CHANNEL 8:TRIP INH	M	H	M	M	3
A	14	24B	(MANOMETER)	RX BLDG NEG PRESSURE	M	H	M	H	2
A	14	252A	(COMPRESSOR 11 LOAD)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(COMPRESSOR 11 OFF)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(COMPRESSOR 11 ON)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(COMPRESSOR 12 LOAD)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(COMPRESSOR 12 OFF)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(COMPRESSOR 12 ON)	COMPRESSOR 11 LOAD	M	H	M	L	3
A	14	252A	(HCV 7583 (CLOSE))	HCV 7583 STATUS	M	H	M	H	2
A	14	252A	(HCV 7583 (OPEN))	HCV 7583 STATUS	M	H	M	H	2

A 14 252A	(SV 7677 (OPEN))	SV 7677 STATUS	M	H	L	L	4
A 14 252A	PI 7636	TANK V-802	M	H	M	L	3
A 14 252A	PI 7644	TANK V-803	M	H	M	L	2
A 14 252A	PI 7652	TANK V-804	M	H	M	L	3
A 14 252A	PI 7660	TANK V-805	M	H	M	L	3
A 14 252A	PI 7668	TANK V-806	M	H	M	L	3
A 14 252B	(C-1004A (RUN))	RECOMBINER BLDG EXH FAN	M	H	L	L	4
A 14 252B	(C-1004A (STOP))	RECOMBINER BLDG EXH FAN	M	H	L	L	4
A 14 252B	(PCV 7496A (CLOSE))	PCV 7496A STATUS	M	H	L	L	4
A 14 252B	(PCV 7496A (OPEN))	PCV 7496A STATUS	M	H	M	L	3
A 14 252B	TI 7512A	EDUCTOR J-1201A OUTLET DEG F	M	H	L	L	4
A 14 252B	TI 7514A	PREHEATER E-603A OUTLET DEG F	M	H	L	L	4
A 14 252B	TI 7528A	RECOMBINER V-801A OUTLET DEG F	M	H	L	L	4
A 14 252B	TI 7536A	CONDENSER E-601A OUTLET WATER DE	M	H	L	L	4
A 14 252B	TI 7541A	CONDENSER E-601A OUTLET GAS DEG	M	H	L	L	4
A 14 252B	TI 7561A	CONDENSER E-607A CONDENSATE DEG	M	H	L	L	4
A 14 252B	TI 7567A	COOLER E-607A OUTLET WATER DEG F	M	H	L	L	4
A 14 252C	(C-1004B (RUN))	RECOMBINER BLDG EXH FAN	M	H	L	L	4
A 14 252C	(C-1004B (STOP))	RECOMBINER BLDG EXH FAN	M	H	L	L	4
A 14 252C	(PCV 7496B (CLOSE))	PCV 7496B STATUS	M	H	M	L	3
A 14 252C	(PCV 7496B (OPEN))	PCV 7496B STATUS	M	H	L	L	4
A 14 252C	TI 7512B	EDUCTOR J-1201B OUTLET DEG F	M	H	L	L	4
A 14 252C	TI 7514B	PREHEATER E-603B OUTLET DEG F	M	H	L	L	4
A 14 252C	TI 7528B	RECOMBINER V-806B OUTLET DEG F	M	H	L	L	4
A 14 252C	TI 7536B	CONDENSER E-601B OUTLET WATER DE	M	H	L	L	4
A 14 252C	TI 7541B	CONDENSER E-601B OUTLET GAS DEG	M	H	L	L	4
A 14 252C	TI 7561B	COOLER E-607B CONDENSATE DEG F	M	H	L	L	4
A 14 252C	TI 7567B	COOLER E-607B OUTLET WATER DEG F	M	H	L	L	4
A 14 252D	RI 7571A	RECOMBINER BLDG INSTRUMENT ROOM	M	H	M	L	3
A 14 252D	RI 7571B	RECOMBINER BLDG PUMP ROOM	M	H	M	L	3
A 14 252D	RI 7612	STORAGE BUILDING	M	H	M	L	3
A 14 252D	RI 7613	COMP BLDG VENT DUCT RADIATION	M	H	M	L	3
A 14 252D	RI 7684	REC BLDG VENT DUCT RADIATION	M	H	M	L	3

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 14		These are infrequently used controls/indicators. No problems have been reported. No relocation is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 15	6.1.2.5(b)(1)		Displays should be mounted greater than 41" from the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 15	13	1-DS11	VALVE CONTROL CHANNEL 1:SQUIB MO	M	L	H	L	4	
A 15	13	1-DS12	VALVE CONTROL CHANNEL 1:SHEAR VL	M	L	H	L	4	
A 15	13	1-DS13	VALVE CONTROL CHANNEL 1:BALL VAL	M	L	L	L	5	
A 15	13	1-DS14	VALVE CONTROL CHANNEL 1:BALL VAL	M	L	L	L	5	
A 15	13	1-DS15	VALVE CONTROL CHANNEL 1:TIME DEL	M	L	L	L	5	
A 15	13	2-DS21	VALVE CONTROL CHANNEL 2:SQUIB MO	M	L	H	L	4	
A 15	13	2-DS22	VALVE CONTROL CHANNEL 2:SHEAR VL	M	L	H	L	4	
A 15	13	2-DS23	VALVE CONTROL CHANNEL 2:BALL VAL	M	L	L	L	5	
A 15	13	2-DS24	VALVE CONTROL CHANNEL 2:BALL VAL	M	L	L	L	5	
A 15	13	2-DS25	VALVE CONTROL CHANNEL 2:TIME DEL	M	L	L	L	5	
A 15	13	3-DS31	VALVE CONTROL CHANNEL 3:SQUIB MO	M	L	H	L	4	
A 15	13	3-DS32	VALVE CONTROL CHANNEL 3:BALL VAL	M	L	L	L	5	
A 15	13	3-DS33	VALVE CONTROL CHANNEL 3:BALL VAL	M	L	L	L	5	
A 15	13	3-DS34	VALVE CONTROL CHANNEL 3:BALL VAL	M	L	L	L	5	
A 15	13	3-DS35	VALVE CONTROL CHANNEL 3:TIME DEL	M	L	L	L	5	
A 15	13	M1	FLUX AMPLIFIER METER	M	L	L	L	5	
A 15	20	(HI D-P HEPA FLTR)	HIGH DP HEPA FILTER	M	L	L	L	5	
A 15	20	(HI D-P ROUGH FLTR)	HIGH DP ROUGHING FILTER	M	L	L	L	5	
A 15	20	(MN GEN AMPERAGE)	MAIN GENERATOR AMPERAGE	M	L	L	M	5	
A 15	20	(MN GEN FREQUENCY)	MAIN GENERATOR FREQUENCY	M	L	L	M	5	
A 15	20	(MN GEN VOLTAGE)	MAIN GENERATOR VOLTAGE	M	L	L	M	5	
A 15	20	LC 1053	HEATER E-12B DUMP	M	L	M	H	4	
A 15	20	LC 1055	HEATER E-13B DUMP	M	L	L	M	5	
A 15	20	LC 1057	HEATER E-14B DUMP	M	L	L	M	5	
A 15	20	LC 1059	HEATER E-15B DUMP	M	L	M	H	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 15	31	(345 KV BKRS AUX RL)	345 KV BREAKERS AUX RELAY DC MON	M	L	L	L	5	
A 15	31	(ANTI-MOTOR CIRCUIT)	ANTI-MOTOR CIRCUIT DC MONITOR	M	L	L	L	5	
A 15	31	TR 1713	GENERATOR STATOR H2 GAS	M	L	L	M	5	
A 15	252D	ES 7571	RADIATION POWER SUPPLY	M	L	M	L	5	
A 15	252D	FIY 7676	OFFGAS DISCHARGE TO STACK	M	L	L	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 15		These components are not frequently used, and relocation is not planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 16	6.4.4.3(a)		Key-operated switches should not be used to protect against accidental activation, only for protecting against unauthorized action

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 16	24A	HS 2988A	MAN AUTO	L	L	H	M	4	
A 16	24B	HS 2988B	MAN AUTO	L	L	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 16		Monticello has not locked these switches to prevent accidental activation, rather to ensure the operating mode of the system. No changes are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 17	6.4.4.3(e)	KEYED SWITCH	Operators should not be able to remove keys unless switch is turned to the OFF or SAFE positions.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 17	3	10A-S16A	11 HX BYPASS MO 2002	L	M	H	H	4	A
A 17	3	10A-S16B	#12 HX BYPASS MO 2003	L	M	H	H	4	A
A 17	3	10A-S18A	CONT SPRAY CLG A 2/3 CORE HT BP	L	M	H	H	4	A
A 17	3	10A-S18B	CONT SPRAY CLG B 2/3 CORE HT BP	L	M	H	H	4	A
A 17	3	10A-S19A	RHRSW PUMPS #11 & 13	L	M	H	H	4	A
A 17	3	10A-S19B	SYS 11 RHRSW PUMPS 12 & 14	L	M	H	H	4	A
A 17	3	10A-S25A	11 RHR MIN FLOW CV 1994	L	M	H	M	4	A
A 17	3	10A-S25B	12 RHR MIN FLOW CV 1995	L	M	H	M	4	A
A 17	3	10A-S25C	13 RHR PUMP MIN FLOW CV 1996	L	M	H	M	4	A
A 17	3	10A-S25D	14 RHR PUMP MIN FLOW CV 1997	L	M	H	M	4	A
A 17	3	10A-S4A	RHR A SUCTION MO 1986	L	M	H	H	4	A
A 17	3	10A-S4B	RHR B SUCTION MO 1987	L	M	H	H	4	A
A 17	3	10A-S7A	RHR CROSS-TIE MO 2033	L	M	H	M	4	A
A 17	3	14A-S16A	C.S INJECTION OBD BYPASS MO 1751	L	M	H	M	4	A
A 17	3	14A-S16B	C.S INJECTION OBD BYPASS MO 1752	L	M	H	M	4	A
A 17	3	14A-S3A	11 C.S. SUCTION MO 1741	L	M	H	H	4	A
A 17	3	14A-S3B	12 C S SUCTION MO 1742	L	M	H	H	4	A
A 17	4	16A-S53	CONTAINMENT VENT RUN MODE INTLK	L	M	H	L	4	A
A 17	5	11A-S1	STANDBY LIQUID CONTROL	L	M	H	H	4	A
A 17	5	16A-S34	VENT ISOL SIGNAL BYP	L	M	H	H	4	A
A 17	5	2-207-27	RWM BYPASS	L	M	L	H	4	A
A 17	5	5A-S1	REACTOR MODE RPS/PCIS	L	M	H	H	4	A
A 17	5	5A-S8	DISCH VOL HIGH WTR BYP	L	M	H	L	4	A
A 17	7	HS-1506	TURB LO. TANK DRAIN MO-1506	L	M	L	M	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 17	8	1-LO/CS	ESSENTIAL BUS TRANSFER	L	M	L	H	4	A
A 17	8	2-LO/CS	ESSENTIAL BUS TRANSFER	L	M	L	H	4	A
A 17	15	16A-S53A	GRP 1 ISOL CH A-1	L	M	L	M	4	A
A 17	15	16A-S53C	GRP 1 ISOL CH A-2	L	M	L	M	4	A
A 17	15	16A-S54A	GRP 2-3 ISOL CH A-1	L	M	L	M	4	A
A 17	15	16A-S54C	GRP 2-3 ISOL CH A-2	L	M	L	M	4	A
A 17	15	5A-CB1A	RX PROTECTION AC MG SET POWER	L	M	L	M	4	A
A 17	15	5A-CB2A	PROTECTION SYSTEM SUBCHANNEL A2	L	M	L	M	4	A
A 17	15	5A-S12A	MSIV SCRAM CH A-1	L	M	M	L	4	A
A 17	15	5A-S12C	MSIV SCRAM CH A-2	L	M	M	L	4	A
A 17	15	5A-S13A	TSV SCRAM CH A-1	L	M	M	L	4	A
A 17	15	5A-S13C	TSV SCRAM CH A-2	L	M	M	L	4	A
A 17	15	5A-S2A	SUBCHANNEL A1	L	M	L	M		A
A 17	15	5A-S2C	SUBCHANNEL A2	L	M	L	M		A
A 17	17	16A-S53B	GRP 1 ISOL CH B-1	L	M	L	M	4	A
A 17	17	16A-S53D	GRP 1-ISOL CH B-2	L	M	L	M	4	A
A 17	17	16A-S54B	GRP 2-3 ISOL CH B-1	L	M	L	M	4	A
A 17	17	16A-S54D	GRP 2-3 ISOL CH B-2	L	M	L	M	4	A
A 17	17	5A-CB1B	PROTECTION SYSTEM SUBCHANNEL B1	L	M	L	M	4	A
A 17	17	5A-CB2B	PROTECTION SYSTEM SUBCHANNEL B2	L	M	L	M	4	A
A 17	17	5A-S12B	MSIV SCRAM CH B-1	L	M	M	L	4	A
A 17	17	5A-S12D	MSIV SCRAM CH B-2	L	M	M	L	4	A
A 17	17	5A-S13B	TSV SCRAM CH B-1	L	M	M	L	4	A
A 17	17	5A-S13D	TSV SCRAM CH B-2	L	M	M	L	4	A
A 17	17	5A-S2B	SUBCHANNEL B1	L	M	L	M		A
A 17	17	5A-S2D	SUBCHANNEL B2	L	M	L	M		A
A 17	24A	HS 2988A	MAN AUTO	L	M	H	M	4	A
A 17	24B	HS 2988B	MAN AUTO	L	M	H	M	4	A
A 17	257	(RM-23 RBV EFF CH A)	RBV EFFLUENT CH A KEY FUNC SW	L	M	L	L	4	A
A 17	257	(RM-23 ST EFF CH A)	STACK EFFLUENT CH A KEY FUNC SW	L	M	L	L	4	A
A 17	258	(RM-23 RBV EFF CH B)	RBV EFFLUENT CH B KEY FUNC SW	L	M	L	L	4	A
A 17	258	(RM-23 ST EFF CH B)	STACK EFFLUENT CH B KEY FUNC SW	L	M	L	L	4	A
A 17	13	(VLV CNTL CL 1(S1))	KEYED SWITCH ON VALVE CONTROL	L	M	H	H	4	B
A 17	13	(VLV CNTL CL 2(S2))	KEYED SWITCH ON VALVE CONTROL	L	M	H	H	4	B
A 17	13	(VLV CNTL CL 3(S1))	KEYED SWITCH ON VALVE CONTROL	L	M	H	H	4	B
A 17	252A	HCS 7583	OFFGAS VENT HCV 7583	L	M	L	H	4	C
A 17	252B	FCS 7490AB	OFFGAS INLET	L	M	L	L	4	C

A 17	252B	FCS 7508A	STEAM TO EDUCTOR FCV-7508A	L	M	M	L	4	C
A 17	252B	HS 7517A	RECOMBINER INLET TCV-7517A	L	M	L	L	4	C
A 17	252C	FCS-7490BB	OFFGAS INLET FCV-7489B	L	M	L	L	4	C
A 17	252C	FCS-7508B	STEAM TO EDUCTOR FCV-7508B	L	M	M	L	4	C
A 17	252C	HS 7517B	RECOMBINER INLET TCV 7517B	L	M	L	L	4	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 17	A	Keylock switches will be replaced if required to ensure that key removal is only possible when the switch is in its designed safety function position.							X
A 17	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
A 17	C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 18	6.5.5.2(a)(5)		Horizontal spacing between numerals on electronic counter should be 1/4 to 1/2 the numeral width.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 18	7	WI-2	GENERATOR LOAD	L	L	L	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 18		Monticello does not plan to change this component. It is a redundant indication of Gross Generator Load and is not significantly decremented as designed.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 19	6.4.1.2(b)		Control should be recessed or surrounded by physical barriers to prevent accidental activation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 19	10	(17-150A (FUNCT))	OFFGAS CHANNEL 1 MONITOR	L	L	M	H	4	
A 19	10	(17-150A (TRIP))	OFFGAS CHANNEL 1 MONITOR	L	L	M	H	4	
A 19	10	(17-150B (FUNCT))	OFFGAS CHANNEL 2 MONITOR	L	L	M	H	4	
A 19	10	(17-150B (TRIP))	OFFGAS CHANNEL 2 MONITOR	L	L	M	H	4	
A 19	5	6A-S2	RX WATER LEVEL MODE SELECTOR	L	L	L	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 19		A barrier will be constructed to prevent accidental activation. The plastic covers used elsewhere in the control room will be considered as well.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 20	6.6.2.4(d)		Administrative procedures should be in place for the periodic cleaning of labels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 20			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 20		Monticello will develop a procedure to ensure that letters on labels are cleaned out with a small brush (toothbrush) on regular intervals.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 21	6.6.3.2(a)		The words used in a label should express exactly the intended actions.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 21	5	7B-S1A	APRM TRIP LEVEL	M	M	L	L	4	
A 21	5	7B-S1B	APRM TRIP LEVEL	M	M	L	L	4	
A 21	5	7B-S1C	APRM TRIP LEVEL	M	M	L	L	4	
A 21	5	7B-S1D	APRM TRIP LEVEL	M	M	L	L	4	
A 21	7	PRO	PRESS REG OVERRIDE	M	M	H	M	4	
A 21	5	MTS 6-84A	FEEDWATER CONT MAN/AUTO STA A	M	M	L	L	4	
A 21	5	MTS 6-84B	FEEDWATER CONT MAN/AUTO STA B	M	M	L	L	4	
A 21	5	LC 6-83	VESSEL LEVEL MASTER CONTROLLER	M	M	L	L	4	
A 21	5	FC-6-85	VESSEL LEVEL LOW FLOW CONTROL	M	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 21		Monticello will assign system engineers to review all of the labels and alarms for the proper system references and the use of a consistent set of "action words" in the function labels.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 22	6.6.5.1(c)		Temporary labels should not obscure prior permanent labels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 22			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 22		Monticello will review the options for temporary labels used for tag-outs that do not obscure the permanent labels.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 23	6.6.5.1(d)		Tag-out labels should clearly identify out-of-service components and equipment.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 23			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 23		Monticello will continue to use the present system to generate tag-outs, using Administrative Procedure 4ACD 4.5.				X	X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 24	6.6.5.1(g)		Tag-outs should be designed to physically prevent activation of a control.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 24			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 24		Monticello will review procedures to verify that they sufficiently guard against activation of a control that is out of service. Monticello generally removes a component from service, rather than depending on a hold or secure card to prevent the operation of a component.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 25	6.6.5.1(h)		Tag-outs should not obscure any adjacent devices or their associated labels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 25			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 25		Monticello will continue to use the present system to generate tag-outs, using Administrative Procedure 4ACD 4.5.				X	X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 26	6.4.1.2(c)		Safety locks should not be used on moveable protective covers.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 26	252A	(K1-TK11)	OG HOLDUP TK#11 DISCH PERMISSIVE	L	L	L	L	5	A
A 26	252A	(K2-TK12)	OG HOLDUP TK#12 DISCH PERMISSIVE	L	L	L	L	5	A
A 26	252A	(K3-TK13)	OG HOLDUP TK#13 DISCH PERMISSIVE	L	L	L	L	5	A
A 26	252A	(K4-TK14)	OG HOLDUP TK#14 DISCH PERMISSIVE	L	L	L	L	5	A
A 26	252A	(K5-TK15)	OG HOLDUP TK#15 DISCH PERMISSIVE	L	L	L	L	5	A
A 26	16	(CR TEST SW DOOR)		L	L	M	L	5	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 26	A	These locks are installed to control the operation of these timers by the Shift Supervisor. No operator interactions are normally required with these timers. No corrective actions are planned.					X		
A 26	B	This panel is locked to allow operation of these test switches with Shift Supervisor approval. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 28	6.9.3.2(a)		Controls should provide capacity to affect the parameter controlled easily, with the required precision.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 28	4	SIC 2-184-16A	RECIRC PUMP A SPEED CONTROL	M	H	L	H	2	A
A 28	4	SIC 2-184-16B	RECIRC PUMP B SPEED CONTROL	M	H	L	H	2	A
A 28	5	FC 2-184-14	MASTER RECIRC FLOW CONTROL	M	H	L	L	4	A
A 28	8	290	REGULATOR VOLTAGE ADJUST	M	H	L	M	3	A
A 28	7	PRO	PRESS REG OVERRIDE	M	H	H	M	2	B
A 28	7	SVT-PB	MAIN STOP VALVES	M	H	M	L	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 28	A	Monticello will not change the sensitivity. The need for additional control precision has been minimized by a change in the new fuel design. In addition, there is a conflict between the need for control precision during fuel preconditioning and the need for rapidly reducing power at other times such as transients. At that time, the increased control precision would have a negative impact.					X		
A 28	B	This is the Pressure Regulator Override switch also discussed in HED I77. No correction is planned.					X		
A 28	C	The problem will be solved by improved preventative maintenance procedures.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 30	6.5.5.2(c)		Character-to-background contrast ratio should be between 15:1 (minimum) to 20:1 (preferred).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 30	5	(RPIS FULL CORE DIS)	ROD POSITION INDICATORS	L	H	H	H	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 30		Monticello will review the maintenance of these indicators to ensure that proper contrast is provided. Any judgment of the performance of these indicators should be tempered by a recognition that the CR operator has multiple indications of control rod position: computer and the 4 Control Rod Display.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 31	6.6.5.2.b(5)		Review procedures should be in place to determine the impact of temporary labels on other system equipment.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 31		Monticello has developed a control room convention specification that addresses all control room labels. This document will resolve concerns in this area. In addition, administrative procedures are in place to control these activities.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 32	6.6.5.1(f)		Tag-outs should not obscure the label associated with the non-operable device

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 32		Administrative procedures are in place that control the tagging out of equipment. These procedures will be enforced as necessary to correct problems in this area.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 33	6.8.1.1(b)	CONTROLLER	The master Recirc Flow controller is not located near related components on the recirc system on C04.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 33	5	FC 2-184-14	MASTER RECIRC FLOW CONTROL	L	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 33		The master Recirc Flow controller will be removed from the system.		X					

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 35	6.8.1.1(b)	RECORDER	The recorder should not be at the upper left corner of C05. It should be located near rod controls for use during startup.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 35	5	NR 7-45	SOURCE RANGE MONITOR LEVEL	L	H	H	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 35		Monticello has reviewed options for correcting this HED. When these options were evaluated by CR operators, they felt that this recorder should not be moved. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 36	6.8.1.1(b)	RECORDER	Recorder should not be on C05, rather on C04 in Recirc system.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 36		Monticello plans to move the recorder to the Recirc system.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 37	6.9.1.2(b)(6)	METER	There is no clear connection of the meter with the associated control 152-305/CS--CIRCULATING WATER PUMP C-100A.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 37	6	DPI 1798	COND E-1A DIFF EAST	L	M	M	M	4	
A 37	6	DPI 1799	COND E-1A DIFF WEST	L	M	M	M	4	
A 37	6	DPI 1800	COND E-1B DIFF EAST	L	M	M	M	4	
A 37	6	DPI 1801	COND E-1B DIFF WEST	L	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 37		Monticello will review the options for modifying this panel to improve the panel instrumentation arrangement.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 39	6.8.1.1(b)	LIGHTS	The position of this indicator is not near the related system. It should be moved to the C20 panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 39	6	M476 131A	HTR E-15A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 131B	HTR E-15A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 132A	HTR E-14A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 132B	HTR E-14A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 133A	HTR E-13A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 133B	HTR E-13A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 134A	HTR E-12A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 134B	HTR E-12A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 135A	HTR E-11A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 135B	HTR E-11A DUMP VALVE	L	H	L	M	3	
A 39	6	M476 140A	HTR E-11B DUMP VALVE	L	H	L	M	3	
A 39	6	M476 140B	HTR E-11B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-137A	HTR E-14B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-137B	HTR E-14B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-138A	HTR E-13B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-138B	HTR E-13B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-139A	HTR E-12B DUMP VALVE	L	H	L	M	3	
A 39	6	M476-139B	HTR E-12B DUMP VALVE	L	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 39		Monticello will move these components.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 40	6.8.1.1(b)	LIGHTS	These lights are not located near the related equipment. They should be located near the RHR or CS systems on C03.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 40	6	M476 246A	ECCS SUMP PUMP P-88A	L	H	H	M	3	
A 40	6	M476 246B	ECCS SUMP PUMP P-88A	L	H	H	M	3	
A 40	6	M476 247A	ECCS SUMP PUMP P-88B	L	H	H	H	3	
A 40	6	M476 247B	ECCS SUMP PUMP P-88B	L	H	H	H	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 40		Monticello will move these lights.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 42	6.5.1.2(b)	RECORDER	All display values must be in immediately useable form, not requiring mental conversion. Scale should read 0 - 27 inches.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 42	6	LR 1278	HOTWELL LEVEL	L	H	M	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 42		Monticello does not believe this recorder is a serious problem. This device has a range of from -15" to +15" with zero (0) being the desired level. Controllers associated with the condenser control at this setpoint. An operator can quickly determine deviation from the desired level. No corrective actions are planned.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 45	6.5.1.1(f)	RECORDER	Recorders do not indicate when they fail or become inoperative.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 45	3	FR 10-143	RHR FLOW	L	H	H	M	3	A
A 45	3	LR 2-3-113	RPV LEVEL	L	H	H	H	3	A
A 45	3	LR 7409	D.W.FLR. & EQPT. DRAIN SUMPS	L	H	M	H	3	A
A 45	3	PLR 7251A	DW RAD/TORUS LVL/DW PRESS	L	H	H	L	3	A
A 45	3	PLR 7251B	DW RAD/TORUS LVL/DW PRESS	L	H	H	L	3	A
A 45	3	VR 7316	TURBINE VIBRATION	L	H	H	M	3	A
A 45	4	CR 12-133	CLEANUP OUTLET CONDUCTIVITY	L	H	L	M	3	A
A 45	4	CR 12-144	CLEANUP INLET CONDUCTIVITY	L	H	L	M	3	A
A 45	4	FR 2-154	RECIRCULATION FLOW	L	H	L	L	4	A
A 45	4	FR 2544	DISCHARGE FLOW	L	H	L	L	4	A
A 45	4	PR 2994	DRYWELL & SUPPR CHBR PRESS	L	H	H	M	3	A
A 45	4	TR 2-167	RECIRC TEMPERATURES	L	H	M	M	3	A
A 45	4	TR 2-3-90	VESSEL SHELL & FLANGE	L	H	L	L	4	A
A 45	5	7-46A	APRM LOCAL POWER LEVEL	L	H	H	H	3	A
A 45	5	7-46B	APRM LOCAL POWER LEVEL	L	H	H	H	3	A
A 45	5	7-46C	APRM LOCAL POWER LEVEL	L	H	H	H	3	A
A 45	5	7-46D	APRM LOCAL POWER LEVEL	L	H	H	H	3	A
A 45	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	L	H	H	M	3	A
A 45	5	FPR 2-3-95	CORE DP/TOTAL CORE FLOW	L	H	L	L	4	A
A 45	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	L	H	M	M	3	A
A 45	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	L	H	M	L	3	A
A 45	5	NR 7-45	SOURCE RANGE MONITOR LEVEL	L	H	H	L	3	A
A 45	5	TRR-3	COMPUTER TREND	L	H	L	L	4	A
A 45	5	TRR-4	COMPUTER TREND	L	H	L	L	4	A
A 45	6	CR 1268	CONDENSATE CONDUCTIVITY	L	H	L	M	3	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 45	6	LR 1278	HOTWELL LEVEL	L	H	M	M	3	A
A 45	6	PR 1149	FEEDWATER PRESSURE	L	H	M	L	3	A
A 45	6	TR 1148A/B	FEEDWATER TEMPERATURE	L	H	M	L	3	A
A 45	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	H	M	M	3	A
A 45	7	PR 1176	TURB THROTTLE & INST.	L	H	H	L	3	A
A 45	7	PR 1264	CONDENSER VACUUM	L	H	H	M	3	A
A 45	7	SR 1715	SPEED-VALVE & BYPASS POSITION	L	H	M	L	3	A
A 45	7	TR 1624	PRIMARY STEAM TO TURBINE TEMP	L	H	L	L	4	A
A 45	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	L	H	L	H	3	A
A 45	7	TR 7998	TURBINE-GEN BEARING METAL TEMP	L	H	M	H	3	A
A 45	7	TRR-2	COMPUTER TREND	L	H	L	L	4	A
A 45	7	VR 1716	VIBRATION RECORDER	L	H	M	H	3	A
A 45	2	NR 17-152	OFFGAS RAD LEVEL	L	H	H	H	3	A
A 45	2	NR 17-154	OFFGAS RAD LEVEL	L	H	M	M	3	A
A 45	2	NR 17-252	MN ST LINE RAD LEVEL	L	H	H	H	3	A
A 45	2	NR 17-353	CLSD COOL WTR/SERV WTR EFF RAD	L	H	H	M	3	A
A 45	2	NR 17-358	DISCHARGE CANAL MONITOR	L	H	H	H	3	A
A 45	2	NR 17-455	REAC BLDG EXH PLENUM	L	H	H	H	3	A
A 45	2	NR 18-55	AREA RADIATION	L	H	H	L	3	A
A 45	2	RR 7433	LIQ PROCESS RAD	L	H	M	H	3	A
A 45	2	RR 7993	DRYWELL CAM	L	H	H	M	3	A
A 45	20	(MN GEN AMPERAGE)	MAIN GENERATOR AMPERAGE	L	H	L	M	3	A
A 45	20	(MN GEN FREQUENCY)	MAIN GENERATOR FREQUENCY	L	H	L	M	3	A
A 45	20	(MN GEN VOLTAGE)	MAIN GENERATOR VOLTAGE	L	H	L	M	3	A
A 45	20	TR 1712	COND & RFP BRGS TEMP	L	H	L	H	3	A
A 45	20	TR 1730	TURB BRG & BRG DRAIN TEMP	L	H	L	H	3	A
A 45	20	TR 1804	CIRCULATING WATER	L	H	L	L	4	A
A 45	20	WR 7269	WIND SPEED/DIRECTION	L	H	H	H	3	A
A 45	21	TR 2-166	SAFETY & BLOWDOWN VALVES	L	H	H	M	3	A
A 45	21	TR 2-184-25	M-G SET OIL & BEARING TEMPS	L	H	M	H	3	A
A 45	21	TR 2-184-26	M-G SET WINDINGS	L	H	M	H	3	A
A 45	21	TR 2-2-31	RECIRC PUMP	L	H	M	H	3	A
A 45	21	TR 2-3-89	REACTOR VESSEL	L	H	H	M	3	A
A 45	21	TR 23-115	HPCI [SYSTEM TEMPERATURE]	L	H	H	H	3	A
A 45	25	TR 1720	DRYWELL COOLER TEMP RECORDER	M	L	H	M	4	A
A 45	26	O2R-3285	% O2	L	H	M	L	3	A
A 45	26	FR 3275	N2 MAKE UP FLOW	L	H	M	L	3	A

A 45 26	TR 3276	MAKEUP AND PURGE N2 TEMPERATURE	L	H	M	L	3	A
A 45 31	TR 1713	GENERATOR STATOR H2 GAS	L	H	L	M	3	A
A 45 31	TR 1714	GENERATOR FIELD TEMPERATURE	L	H	L	H	3	A
A 45 31	W-VAR/R	WATT-VAR	L	H	L	M	3	A
A 45 257	RR 7858A	STACK NOBLE GAS	L	H	H	H	3	A
A 45 257	RR 7858C	STACK NOBLE GAS	L	H	H	H	3	A
A 45 257	RR 7859A	RBV NOBLE GAS	L	H	H	H	3	A
A 45 257	RR 7859C	RBV NOBLE GAS	L	H	H	H	3	A
A 45 258	RR 7858B	STACK NOBLE GAS	L	H	H	H	3	A
A 45 258	RR 7858D	STACK NOBLE GAS	L	H	H	H	3	A
A 45 258	RR 7859B	RBV NOBLE GAS	L	H	H	H	3	A
A 45 258	RR 7859D	RBV NOBLE GAS	L	H	H	H	3	A
A 45 259	AR 4018A	O2/H2 CONCENTRATION CH A	L	H	M	M	3	A
A 45 260	AR 4018B	O2/H2 CONCENTRATION CH B	L	H	M	M	3	A
A 45 13	HP 7035B	X-Y RECORDER	L	H	L	M	3	B
A 45 252A	FR 7676	OFFGAS FLOW TO STACK	L	H	L	H	3	C
A 45 252A	TR 7527	RECOMBINER TEMPERATURE DEG F	L	H	L	L	4	C
A 45 252B	AR-7554A	OFFGAS OUTLET H2 CONC	L	H	M	L	3	C
A 45 252B	FR 7492A	OFFGAS FLOW	L	H	L	L	4	C
A 45 252B	FR 7508A	#11 EDUCTOR STEAM FLOW & OUTLET	L	H	M	L	3	C
A 45 252C	AR-7554B	OFFGAS OUTLET H2 CONC	L	H	M	L	3	C
A 45 252C	FR 7492B	OFFGAS FLOW	L	H	L	L	4	C
A 45 252C	FR 7508B	#12 EDUCTOR STEAM FLOW & OUTLET	L	H	M	L	3	C
A 45 252D	RR 7573	OFFGAS COMP STORAGE	L	H	M	L	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 45	A	Operators are instructed to use diverse indicators to determine the authenticity of any instrument reading. It is not feasible to display with lights all the possible failure modes of these instruments. No corrective actions are planned.					X		
A 45	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
A 45	C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 46	6.8.1.1(b)	METER	The FIY 7676 meter should be located on C252A, closer to the associated components.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 46	252D	FIY 7676	OFFGAS DISCHARGE TO STACK			L	L	C	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 46		This HED will be resolved as part of the review and resolution to all HEDs on panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 47	6.5.1.2(b)	METER	The meter should read in CFM since the release is in CFM.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 47	252D	FIY 7676	OFFGAS DISCHARGE TO STACK	L	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 47		The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 48	6.8.1.1(b)	METER	The power supply is not located near the rad monitors on this panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 48	252D	ES 7571	RADIATION POWER SUPPLY	L	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 48		The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 49	6.5.2.1(c)	METER	Scale values should increase to the right. The manometer shows increasing pressure to the left. Valence is not marked.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 49	24B	(MANOMETER)	RX BLDG NEG PRESSURE					C	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 49		Monticello will mark the valence clearly on the manometer, showing pressure increasing to the left.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 51			The component is too high for a 5' tall woman to reach or control with accuracy, as demonstrated by testing at Monticello.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 51	3	TI 4072A	SUPP POOL TEMPERATURE	L	H	H	L	3	
A 51	3	TI 4072B	SUPP POOL TEMPERATURE	L	H	H	L	3	
A 51	7	PC 1246	11 SJAE PRESS CONTROL	L	H	M	M	3	
A 51	7	PC 1247	12 SJAE PRESS CONTROL	L	H	M	M	3	
A 51	8	(345 KV BUS VOL)	345 KV BREAKER	L	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 51		These are infrequently used controls. No 5% female is presently assigned to the operations staff. If such a person was eventually assigned, she could be assisted by another operator.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 56	6.4.1.1(b)	METER	These components are not necessary on the panel, and they clutter the panel area taking up space unnecessarily.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 56	252D	FY 7476A	FLOW COMPUTER	L	M	L	L	4	
A 56	252D	FY 7477A	FLOW COMPUTER	L	M	L	L	4	
A 56	252D	FY 7477B	FLOW COMPUTER	L	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 56		This HED will be resolved as part of the review and resolution to all HEDs on panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 57	6.4.1.1		Complicated keypad on recorder should either have more support or have the keypad covered up.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 57	21	TR 2-166	SAFETY & BLOWDOWN VALVES	L	H	H	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 57		The keyboard referenced in this HED is intended for use by Instrument & Control technicians. Control Room Operators are not expected to operate these control. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 59	6.5.1.3(f)		Glare on the surface reduces the visibiliy of the display.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 59	21	TR 2-3-89	REACTOR VESSEL	M	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 59		The problem with glare on this recorder window was reviewed. Monticello is investigating the installation of parabolic louvers on control room lights to reduce glare. It is felt that the glare problem on this recorder is acceptable. No other corrective action is planned.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 60			Mimic is unnecessarily circuituous and should include the valves.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 60	291	(RECOMBINER PANELS)	RECOMBINER PANELS A AND B	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 60		A review of this panel reveals that the appropriate valves are included in the mimic, but better association could be shown between these valves and the panel controls. Additional mimic lines well be provided to better associate valves and controls.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 61	6.1.1.3(c)(2)		Operators should be able to position themselves conveniently at the workstation. Their position is constrained when seated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 61	5			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 61		The amount of time that an operator spends in this workstation does not justify the redesign of the workspace.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 62	6.1.1.3(d)(1)		The arrangement should facilitate efficient, unobstructed movement & communication. They must walk around the chair & table.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 62	5			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 62		There is sufficient room behind the workstation to pass efficiently.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 63	6.1.2.3(h)(1)		A writing space of 16" deep by 24" wide is required at a workstation. The rod selection controls fill this area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 63	5			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 63		Monticello provides a portable table for the operator to use when at that workstation.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
A 64	6.1.2.3(g)		Sufficient leg & foot room should be provided to avoid awkward & uncomfortable positions. Bumping a knee on the bell is possible.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
A 64	5			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
A 64		The amount of time that an operator spends in this workstation does not justify the relocation of the phone bell.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 20	6.5.2.2(b)(2)	CONTROLLER	Scale pointers should be mounted to avoid parallax errors (mounted on the same plane as graduations).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 20	24A	FIC 2943	SBTS FAN DISCHARGE	L	L	H	M	4	
C 20	24B	FIC 2942	SGTS FAN DISCHARGE	L	L	H	M	4	
C 20	24A	FIC 2943	SBTS FAN DISCHARGE	L	L	H	M	4	
C 20	24B	FIC 2942	SGTS FAN DISCHARGE	L	L	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 20		Monticello has replaced this component and it has been subsequently reviewed.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 31	6.4.4.5(b)(2)	KEY OPERATED CONTROL	It should not be possible to position a control between detented positions or have a control appear to be in such a position.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 31	5	5A-S1	REACTOR MODE RPS/PCIS	M	H	H	H	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 31		Monticello has not experienced significant problems with this switch. Problems with the Mode switch is a generic BWR problem. The BWR Owners group is funding research on this device. Monticello will consider replacing this device when an improved switch is available.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 48	6.5.3.1(c)(1)	LEGEND PUSHBUTTON	System status should be inferred by illumination, not by its absence. Equipment state should be unambiguously indicated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 48	8	(PWR SYS SBLR-PB)	POWER SYSTEM STABILIZER	L	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 48		Monticello does not plan to add another component to indicate both states of the equipment. This light is normally illuminated. If the light is out the control room operator would assume the bulb has failed and investigate, or would know via the shift Turn Over Checklist that this system was not in service.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 49	6.5.3.1(d)	INDICATOR	Alerting to unfavorable status should be a function of the annunciator system, not of status lights on the main board.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 49	10	RM 7992A (ALERT)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	
C 49	10	RM 7992A (FAIL)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	
C 49	10	RM 7992A (HIGH)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	
C 49	10	RM 7992B (ALERT)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	
C 49	10	RM 7992B (FAIL)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	
C 49	10	RM 7992B (HIGH)	TURB BLDG NORMAL WASTE SUMP	L	H	H	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 49		Monticello does not intend to change this device. This is a typical design for this type of device. All instruments cannot be located on the front panel. When a trip signal is generated by these devices, two things happens. (1) A trip signal is sent to a front panel alarm window that directs the operator to this panel. (2) A light is illuminated on the affected instrument to assist the operator in quickly identifying the unit that is tripped and what trip has been actuated. These lights are backed up by an instrument meter that indicates the actual signal being generated by the device.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 57	6.4.1.2(b)	ROUND PUSHBUTTON	Controls may be recessed or surrounded by physical barriers to prevent accidental activation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 57	5	(ALM CRT ACK)	ALARM CRT ACKNOWLEDGE	L	L	L	M	5	
C 57	5	5A-S3A	REACTOR SCRAM A	L	L	H	H	4	
C 57	5	5A-S3B	REACTOR SCRAM B	L	L	H	H	4	
C 57	11	18-51C	NEW FUEL STORAGE VAULT AREA MON	L	L	H	L	4	
C 57	10	17-452A	REACTOR BLDG EXH PLENUM CH 1	L	L	H	H	4	B
C 57	10	17-452B	REACTOR BLDG EXH PLENUM CH 2	L	L	H	H	4	B
C 57	10	17-453A	SPENT FUEL POOL CHANNEL A	L	L	H	H	4	B
C 57	10	17-453B	SPENT FUEL CHANNEL B	L	L	H	H	4	B
C 57	10	17-454	CONTROL ROOM AIR INTAKE	L	L	H	M	4	B
C 57	10	RM 7992A	TURB BLDG NORMAL WASTE SUMP	L	L	H	M	4	B
C 57	10	RM 7992B	TURB BLDG NORMAL WASTE SUMP	L	L	H	M	4	B
C 57	11	18-50	CONTROL ROOM LOW RANGE AREA MON	L	L	H	L	4	B
C 57	11	18-51A	REFUEL FLOOR LOW RANGE AREA MON	L	L	H	L	4	B
C 57	11	18-51B	REFUEL FLOOR STAIRWAY AREA MON	L	L	H	L	4	B
C 57	11	18-51C	NEW FUEL STORAGE VAULT AREA MON	L	L	H	L	4	B
C 57	11	18-51D	CONTAMINATED EQUIPMENT AREA MON	L	L	H	L	4	B
C 57	11	18-51E	CONTAMINATED STORAGE AREA MON	L	L	H	L	4	B
C 57	11	18-51F	RADWASTE ACCESS AREA MON	L	L	H	L	4	B
C 57	11	18-51G	CLEAN UP SYSTEM AREA ACCESS MON	L	L	H	L	4	B
C 57	11	18-51H	CONTROL ROD DR REPAIR AREA MON	L	L	H	L	4	B
C 57	11	18-51I	EAST CRD MODULE AREA MON	L	L	H	L	4	B
C 57	11	18-51J	WEST CRD MODULE AREA MON	L	L	H	L	4	B
C 57	11	18-51K	TIP DRIVE AREA MON	L	L	H	L	4	B
C 57	11	18-51L	HPCI TURBINE AREA MON	L	L	H	L	4	B

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 57	11	18-51M	CONTROL ROD DRIVE PUMP AREA MON	L	L	H	L	4	B
C 57	11	18-51N	RCIC EQUIPMENT AREA MON	L	L	H	L	4	B
C 57	11	18-51P	EAST CORE SPRAY & RHR AREA MON	L	L	H	L	4	B
C 57	11	18-51Q	WEST CORE SPRAY & RHR AREA MON	L	L	H	L	4	B
C 57	11	18-51R	CONTROL LAB AREA MONITOR	L	L	H	L	4	B
C 57	11	18-51S	TG FRONT STANDARD AREA MONITOR	L	L	H	L	4	B
C 57	11	18-51T	CONDENSATE DEMIN OPERATING AREA	L	L	H	L	4	B
C 57	11	18-51U	CONDENSATE SYSTEM AREA MON	L	L	H	L	4	B
C 57	11	18-51V	FEEDWATER PUMP AREA MON	L	L	H	L	4	B
C 57	11	18-51W	RADWASTE CONTROL ROOM AREA MON	L	L	H	L	4	B
C 57	11	18-51X	SAMPLE TANK AREA MON	L	L	H	L	4	B
C 57	11	18-51Y	CONVEYOR OPERATING AREA MON	L	L	H	L	4	B
C 57	11	18-51Z	MACHINE SHOP AREA MON	L	L	H	L	4	B
C 57	11	18-52	REFUEL FLOOR HIGH RANGE AREA MON	L	L	H	L	4	B
C 57	11	18-57A	TIP CUBICLE	L	L	H	L	4	B
C 57	11	18-57B	CONTROL ROOM HIGH RANGE	L	L	H	L	4	B
C 57	11	18-57C	OPERATING FLOOR	L	L	H	L	4	B
C 57	11	RI 7774	OFFGAS STORAGE F-2	L	L	H	L	4	B
C 57	13	1-S2	DRIVE CONTROL CHANNEL 1 AUTO/STA	L	L	L	L	5	B
C 57	13	2-S2	DRIVE CONTROL CHANNEL 2 AUTO/STA	L	L	L	L	5	B
C 57	13	3-S2	DRIVE CONTROL CHANNEL 3 AUTO/STA	L	L	L	L	5	B
C 57	21	(RESET (C21))		L	L	H	L	4	B
C 57	21	(TEST (C21))		L	L	H	L	4	B
C 57	252D	RI 7571A	RECOMBINER BLDG INSTRUMENT ROOM	L	L	M	L	5	B
C 57	252D	RI 7571B	RECOMBINER BLDG PUMP ROOM	L	L	M	L	5	B
C 57	252D	RI 7612	STORAGE BUILDING	L	L	M	L	5	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 57	A	The alarm acknowledge pushbutton will be removed by the process computer replacement during the 1987 outage.	X						

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 57	B	Monticello has reviewed these components. No problems have been identified with inadvertent activation of these devices. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 62	6.5.3.1(c)(1)	ROUND PUSHBUTTON	System status should be inferred by illumination, not its absence and equipment status should be unambiguously indicated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 62	31	(GATE (OPEN))	GATE (OPEN) PUSHBUTTON	L	H	L	L	4	A
C 62	7	M-478-40	LIFT PUMPS	L	H	M	L	3	B
C 62	13	1-S2	DRIVE CONTROL CHANNEL 1 AUTO/STA	L	H	L	L	4	C
C 62	13	2-S2	DRIVE CONTROL CHANNEL 2 AUTO/STA	L	H	L	L	4	C
C 62	13	3-S2	DRIVE CONTROL CHANNEL 3 AUTO/STA	L	H	L	L	4	C
C 62	252A	(AUX COMP 11 (OFF))	AUXILIARY COMPRESSOR 11	L	H	M	L	3	D
C 62	252A	(AUX COMP 11 (ON))	AUXILIARY COMPRESSOR 11	L	H	M	L	3	D
C 62	252A	(AUX COMP 12 (OFF))	AUXILIARY COMPRESSOR 12	L	H	M	M	3	D
C 62	252A	(AUX COMP 12 (ON))	AUXILIARY COMPRESSOR 12	L	H	M	M	3	D
C 62	252A	(OFFGAS COM 11(OFF))	OFFGAS PRESS CONTROL	L	H	M	L	3	D
C 62	252A	(OFFGAS COM 11(ON))	OFFGAS PRESS CONTROL	L	H	M	L	3	D
C 62	252A	(OFFGAS COM 11(RST))	OFFGAS PRESS CONTROL	L	H	M	L	3	D
C 62	252A	(OFFGAS COM 12(OFF))	OFFGAS PRESS CONTROL	L	H	M	L	3	D
C 62	252A	(OFFGAS COM 12(ON))	OFFGAS PRESS CONTROL	L	H	M	L	3	D
C 62	252A	(OFFGAS COM 12(RST))	OFFGAS PRESS CONTROL	L	H	M	L	3	D

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 62	A	Monticello will remove this button from the panel.	X						

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 62	B	Monticello will review the design of this control to improve the system status indication.							X
C 62	C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C 62	D	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 82	6.5.3.1(c)(1)	ROTARY SELECTOR	System status should be inferred by illumination, not its absence, and equipment status should be unambiguously indicated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 82	3	23A-S23	TURBINE TEST	L	H	M	L	3	A
C 82	31	(GATE)	GATE POSITION SELECTOR SWITCH	L	H	L	L	4	A
C 82	5	3A-S6	TIMER TEST	L	H	L	M	3	B
C 82	25	HS 8040 A	FAN INLET DAMPER	L	H	H	M	3	B
C 82	25	HS 8040 B	FAN INLET DAMPER	L	H	H	M	3	B
C 82	25	HS 8040 C	FAN INLET DAMPER	L	H	H	M	3	B
C 82	25	HS 8040 D	FAN INLET DAMPER	L	H	H	M	3	B
C 82	25	HS 8040R	DAMPER CONTROL	L	H	H	M	3	B
C 82	25	HS 8040S	DAMPER CONTROL	L	H	H	M	3	B
C 82	25	HS 8040U	DAMPER CONTROL	L	H	H	M	3	B
C 82	13	(VLV CNTL CL 1(S3))	PURGE SWITCH ON VALVE CNTL 1 & 2	L	H	H	H	3	C
C 82	252D	RI 7571A	RECOMBINER BLDG INSTRUMENT ROOM	L	H	M	L	3	D
C 82	252D	RI 7571B	RECOMBINER BLDG PUMP ROOM	L	H	M	L	3	D

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 82	A	Monticello will remove this component from the panel.	X						
C 82	B	Monticello will review the operation of the display/control combination to ensure that the operator has unambiguous indication of the system status.							X

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RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 82	C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C 82	D	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C 85	6.5.3.2(b)	ROTARY SELECTOR	Illuminated indicator should be at least 10% brighter than surrounding panel (50% brighter is preferred).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C 85	20	42-3208/CS	HEAT EXCH AREA FAN V-AC-9	L	M	L	L	4	
C 85	20	42-3305/CS	SOUTHEAST EQUIP RM FAN V-AC-5	L	M	H	M	4	
C 85	20	42-3307/CS	CRD PUMP ROOM FAN V-AC-7A	L	M	M	L	4	
C 85	20	42-3308/CS	HPCI ROOM FAN V-AC-8A	L	M	H	M	4	
C 85	20	42-4305/CS	SOUTHWEST EQUIP RM FAN V-AC-4	L	M	H	M	4	
C 85	20	42-4306/CS	NORTHEAST EQUIP RM FAN V-AC-6	L	M	H	M	4	
C 85	20	42-4307/CS	CRD PUMP ROOM FAN V-AC-7B	L	M	M	L	4	
C 85	20	42-4308/CS	HPCI ROOM FAN V-AC-8B	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C 85		Monticello will review the lenses in the control room and establish a standard (added to convention spec). All covers will be changed to conform to that standard.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C102	6.5.3.1(c)(1)	J-HANDLE OR T-HANDLE	System status should be inferred by illumination, not its absence.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C102	5	3A-S3	ROD OUT NOTCH OVERRIDE	L	H	M	L	3	A
C102	252A	(COMPRESSOR 11 LOAD)	COMPRESSOR 11 LOAD	H	H	M	L	1	B
C102	252A	HS 7635	TANK 11	L	H	M	H	3	B
C102	252A	HS 7643	TANK 12	L	H	M	H	3	B
C102	252A	HS 7651	TANK 13	L	H	M	H	3	B
C102	252A	HS 7659	TANK 14	L	H	M	H	3	B
C102	252A	HS 7667	TANK 15	L	H	M	H	3	B
C102	252B	HS-101A	RECOMBINER 11 HEATER	L	H	L	L	4	B
C102	252B	TSA	TRAIN A TEST	L	H	L	L	4	B
C102	252C	HS-101B	RECOMBINER 12 HEATER	L	H	L	L	4	B
C102	252C	TSB	TRAIN B TEST	L	H	L	L	4	B
C102	3	23A-S16	EX POT DRN TO GLD	L	H	M	M	3	D
C102	7	BPHM	#2 SV BYPASS BYPASS HANDWHEEL	L	H	M	M	3	D
C102	8	DG1/CS	NO.11 DIESEL GEN CONTROL	L	H	H	M	3	D
C102	8	DG2/CS	NO.12 DIESEL GEN CONTROL	L	H	H	M	3	D
C102	26	(BLANK-1)	J-HANDLE 1ST ROW, 2ND FROM LEFT	L	H	X	X	3	E
C102	26	(BLANK-2)	J-HANDLE 2ND ROW, 2ND FROM LEFT	L	H	X	X	3	E

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C102	A	Monticello does not plan to change this component; the light simply gives feedback that the switch has moved.					X		

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C102	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C102	C	Monticello does not plan to change these components. The components appear to satisfy the requirements as designed.					X		
C102	D	Indicating lights within this group have alternate methods such as alarms or other redundant displays as confirmation of the indicating light status. No corrective actions are planned.					X		
C102	E	These switches have been abandoned. They will be removed if it is determined that they are not going to be reused.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C112	6.6.3.8(c)	J-HANDLE OR T-HANDLE	Control position information should be visible to the operator during control manipulation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C112	7	ETV	EMERGENCY TRIP VALVES TEST	L	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C112		Monticello will enhance these components with relabelling and/or a new pointer.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C125	6.5.5.1(a)(3)	DIGITAL DISPLAY	More than four digits should be grouped, with groups set off by commas or decimal points.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C125	4	FQ 2543	DRYWELL FLOOR DRAIN SUMP DISCH	L	H	M	L	3	
C125	4	FQ 2544	DRYWELL EQUIPMENT DRAIN SUMP DIS	L	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C125		Monticello will revise the meter faces of these recorders.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C126	6.5.5.1(b)(3)	DIGITAL DISPLAY	One digit per drum counter should appear in a window at any one time.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C126	4	FQ 2543	DRYWELL FLOOR DRAIN SUMP DISCH	L	L	M	L	5	
C126	4	FQ 2544	DRYWELL EQUIPMENT DRAIN SUMP DIS	L	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C126		Monticello does not plan to replace this indicator. No problems have been identified with reading these counters. Supporting data is available from the computer.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C127	6.5.5.1(c)(1)	DIGITAL DISPLAY	Counter drums should change number by snap action instead of continuous movement.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C127	4	FQ 2543	DRYWELL FLOOR DRAIN SUMP DISCH	L	L	M	L	5	
C127	4	FQ 2544	DRYWELL EQUIPMENT DRAIN SUMP DIS	L	L	M	L	5	
C127	24A	(CRAMER)	HOUR DIGITAL DISPLAY	L	L	L	M	5	
C127	24B	(CRAMER)	HOUR DIGITAL DISPLAY	L	L	L	M	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C127		Monticello does not plan to change this instrument. It functions acceptably for the current application, where the value changes slowly.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C133	6.5.1.1(f)	INDICATOR LIGHT	Failure of panel instruments should be apparent to the operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C133	3	16A DS200	INBD MSIV SOL VLV PWR	M	L	H	M	4	A
C133	3	16A DS201	INBD MSIV SOL VLV PWR	M	L	H	M	4	A
C133	3	16A DS202	OTBD MSIV SOL VLV PWR	M	L	H	M	4	A
C133	3	16A DS203	OTBD MSIV SOL VLV PWR	M	L	H	M	4	A
C133	4	2A DS32A	SEAL LEAKOFF BLOCK VALVE	M	L	L	M	5	A
C133	4	2A DS32B	SEAL LEAKOFF BLOCK VALVE	M	L	L	M	5	A
C133	4	2A DS33A	RECIRCULATION MG SET A	M	L	L	M	5	A
C133	4	2A DS33B	RECIRCULATION MG SET B	M	L	L	M	5	A
C133	4	2A DS3A	GEN LOCK OUT BUS P.S.A.	M	L	L	L	5	A
C133	4	2A DS3B	GEN LOCKOUT BUS P.S.B.	M	L	L	L	5	A
C133	5	11A-DS1A	PUMP RUNNING 11-2A	M	L	H	H	4	A
C133	5	11A-DS1B	PUMP RUNNING 11-2B	M	L	H	H	4	A
C133	5	11A-DS2A	SQUIB VALVE READY 11-14A	M	L	H	H	4	A
C133	5	11A-DS2B	SQUIB VALVE READY 11-14B	M	L	H	H	4	A
C133	5	3A-DS1	ROD OUT PERMIT	M	L	M	L	5	A
C133	5	3A-DS2	2 SEC SELECT	M	L	M	L	5	A
C133	5	3A-DS5	ROD OUT SETTLE	M	L	M	L	5	A
C133	5	3A-DS7	REFUEL MODE ONE ROD PERMISSIVE	M	L	M	M	5	A
C133	5	3A-DS9	2 SEC SELECT	M	L	L	L	5	A
C133	5	DS1A	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C133	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	M	L	H	H	4	A
C133	6	M476 235C	LOW FLOW	M	L	L	M	5	A
C133	6	M476 235D	HIGH FLOW	M	L	L	M	5	A
C133	6	M476 236C	LOW FLOW	M	L	L	M	5	A
C133	6	M476 236D	HIGH FLOW	M	L	L	M	5	A
C133	6	M476-10C	#12 COND. PUMP LARGE MOTOR MON.	M	L	M	H	4	A
C133	6	M476-157C	#11 CLG TOWER - LARGE MOTOR MON.	M	L	L	M	5	A
C133	6	M476-158C	#12 CLG TOWER - LARGE MOTOR MON	M	L	L	M	5	A
C133	6	M476-1C	#11 RFP LARGE MOTOR MONITOR	M	L	M	H	4	A
C133	6	M476-241C	PUMP 11 LARGE MOTOR MONITOR	M	L	L	L	5	A
C133	6	M476-242C	#12 CIRC.WTR PUMP LRG. MOTOR MON	M	L	M	M	5	A
C133	6	M476-244C	COND. AIR VENT AUTO-SETUP	M	L	M	M	5	A
C133	6	M476-245C	COND. AIR VENT AUTO-SETUP	M	L	M	M	5	A
C133	6	M476-2C	#12 RFP LARGE MOTOR MONITOR	M	L	M	H	4	A
C133	6	M476-9C	--	M	L	M	H	4	A
C133	7	HS-1638	BTV VALVES LINE B	M	L	M	L	5	A
C133	7	MTS-1	VACUUM TRIP 1	M	L	L	L	5	A
C133	7	MTS-2	VACUUM TRIP 2	M	L	L	L	5	A
C133	8	(PWR SYS SBLR-LIGHT)	POWER SYSTEM STABILIZER	M	L	L	L	5	A
C133	8	(SHEAR VLV MONITOR)		M	L	L	L	5	A
C133	8	(SYNCHRONIZING)		M	L	L	H	4	A
C133	2	(STACK RAD)	STACK RADIATION	M	L	M	M	5	A
C133	10	17-150A	OFF GAS CH 1	M	L	H	H	4	A
C133	10	17-150B	OFF GAS CH 2	M	L	H	H	4	A
C133	10	17-251A	MAIN STEAM LINE CHANNEL A	M	L	H	H	4	A
C133	10	17-251B	MAIN STEAM LINE CHANNEL B	M	L	H	H	4	A
C133	10	17-251C	MAIN STEAM LINE CHANNEL C	M	L	H	H	4	A
C133	10	17-251D	MAIN STEAM LINE CHANNEL D	M	L	H	H	4	A
C133	10	17-351	SERVICE WATER EFFLUENT	M	L	H	H	4	A
C133	10	17-352	CLOSED COOLING WATER EFFLUENT	M	L	M	M	5	A
C133	10	17-357A	DISCHARGE CANAL MONITOR A	M	L	H	H	4	A
C133	10	17-357B	DISCHARGE CANAL MONITOR B	M	L	H	H	4	A
C133	10	17-451A	POWER SUPPLY PROCESS MON	M	L	H	L	4	A
C133	10	17-451B	POWER SUPPLY PROCESS MON	M	L	H	L	4	A
C133	10	17-452A	REACTOR BLDG EXH PLENUM CH 1	M	L	H	H	4	A
C133	10	17-452B	REACTOR BLDG EXH PLENUM CH 2	M	L	H	H	4	A

C133 10	17-453A	SPENT FUEL POOL CHANNEL A	M	L	H	H	4	A
C133 10	17-453B	SPENT FUEL CHANNEL B	M	L	H	H	4	A
C133 10	17-454	CONTROL ROOM AIR INTAKE	M	L	H	M	4	A
C133 11	18-50	CONTROL ROOM LOW RANGE AREA MON	M	L	H	L	4	A
C133 11	18-51A	REFUEL FLOOR LOW RANGE AREA MON	M	L	H	L	4	A
C133 11	18-51B	REFUEL FLOOR STAIRWAY AREA MON	M	L	H	L	4	A
C133 11	18-51C	NEW FUEL STORAGE VAULT AREA MON	M	L	H	L	4	A
C133 11	18-51D	CONTAMINATED EQUIPMENT AREA MON	M	L	H	L	4	A
C133 11	18-51E	CONTAMINATED STORAGE AREA MON	M	L	H	L	4	A
C133 11	18-51F	RADWASTE ACCESS AREA MON	M	L	H	L	4	A
C133 11	18-51G	CLEAN UP SYSTEM AREA ACCESS MON	M	L	H	L	4	A
C133 11	18-51H	CONTROL ROD DR REPAIR AREA MON	M	L	H	L	4	A
C133 11	18-51I	EAST CRD MODULE AREA MON	M	L	H	L	4	A
C133 11	18-51J	WEST CRD MODULE AREA MON	M	L	H	L	4	A
C133 11	18-51K	TIP DRIVE AREA MON	M	L	H	L	4	A
C133 11	18-51L	HPCI TURBINE AREA MON	M	L	H	L	4	A
C133 11	18-51M	CONTROL ROD DRIVE PUMP AREA MON	M	L	H	L	4	A
C133 11	18-51N	RCIC EQUIPMENT AREA MON	M	L	H	L	4	A
C133 11	18-51P	EAST CORE SPRAY & RHR AREA MON	M	L	H	L	4	A
C133 11	18-51Q	WEST CORE SPRAY & RHR AREA MON	M	L	H	L	4	A
C133 11	18-51R	CONTROL LAB AREA MONITOR	M	L	H	L	4	A
C133 11	18-51S	TG FRONT STANDARD AREA MONITOR	M	L	H	L	4	A
C133 11	18-51T	CONDENSATE DEMIN OPERATING AREA	M	L	H	L	4	A
C133 11	18-51U	CONDENSATE SYSTEM AREA MON	M	L	H	L	4	A
C133 11	18-51V	FEEDWATER PUMP AREA MON	M	L	H	L	4	A
C133 11	18-51W	RADWASTE CONTROL ROOM AREA MON	M	L	H	L	4	A
C133 11	18-51X	SAMPLE TANK AREA MON	M	L	H	L	4	A
C133 11	18-51Y	CONVEYOR OPERATING AREA MON	M	L	H	L	4	A
C133 11	18-51Z	MACHINE SHOP AREA MON	M	L	H	L	4	A
C133 11	18-52	REFUEL FLOOR HIGH RANGE AREA MON	M	L	H	L	4	A
C133 11	18-53A	POWER SUPPLY FOR AREA MONITOR	M	L	H	L	4	A
C133 11	18-53B	POWER SUPPLY FOR AREA MONITOR	M	L	H	L	4	A
C133 11	18-53C	POWER SUPPLY FOR AREA MONITOR	M	L	H	L	4	A
C133 11	18-57A	TIP CUBICLE	M	L	H	L	4	A
C133 11	18-57B	CONTROL ROOM HIGH RANGE	M	L	H	L	4	A
C133 11	18-57C	OPERATING FLOOR	M	L	H	L	4	A
C133 11	ES 7774	POWER SUPPLY	M	L	H	L	4	A
C133 20	(11 MG-F S)	11 RECIRC MG SET-FIRE SYSTEM OP	M	L	M	H	4	A
C133 20	(12 MG-F S)	12 RECIRC MG SET-FIRE SYSTEM OP	M	L	M	H	4	A
C133 20	(BLDG SDG-F D)	BUILDING SIDING-FIRE DETEC OP	M	L	M	H	4	A
C133 20	(BLDG SDG-F S)	BUILDING SIDING-FIRE SYSTEM OP	M	L	M	H	4	A
C133 20	(BLDG SDG-LO A)	BUILDING SIDING-TROUBLE-LOW AIR	M	L	M	H	4	A
C133 20	(CR EFT AI SM DR TR)	CONTROL RM EFT AI SMOKE DETECTOR	M	L	H	M	4	A
C133 20	(CR EFT SMOKE ALARM)	CONTROL RM EFT OAI SMOKE ALARM	M	L	H	M	4	A

C133	20	(DIESEL FIREPUMP CN)	DIESEL FIRE PUMP CONTROL SWITCH	M	L	H	H	4	A
C133	20	(DIESEL FIREPUMP TR)	DIESEL FIRE PUMP TROUBLE	M	L	H	H	4	A
C133	20	(DIRTY OIL STORE-FS)	DIRTY OIL-FIRE SYSTEM OPERATED	M	L	M	H	4	A
C133	20	(HI D-P HEPA FLTR)	HIGH DP HEPA FILTER	M	L	L	L	5	A
C133	20	(HI D-P ROUGH FLTR)	HIGH DP ROUGHING FILTER	M	L	L	L	5	A
C133	20	(LUBE OIL STOR-F S)	LUBE OIL STORE-FIRE SYS OPERATED	M	L	M	H	4	A
C133	20	(NO. 1 M TRANS-F D)	NO. 1 MAIN TRANS-FIRE DETECTOR	M	L	M	H	4	A
C133	20	(NO. 1 M TRANS-F S)	NO. 1 MAIN TRANS-FIRE SYS OPER	M	L	M	H	4	A
C133	20	(NO. 1 M TRANS-LO A)	NO. 1 MAIN TRANS-TROUBLE LOW AIR	M	L	M	H	4	A
C133	20	(NO. 1 R TRANS-F D)	NO. 1R RESERV TR-FIRE DETECTOR	M	L	M	H	4	A
C133	20	(NO. 1 R TRANS-F S)	NO. 1R RESERV TR-FIRE SYS OPER	M	L	M	H	4	A
C133	20	(NO. 1 R TRANS-LO A)	NO. 1R RESERV TR-TROUBLE LOW AIR	M	L	M	H	4	A
C133	20	(NO. 11 A TRAN-F D)	NO. 11 A TRAN-FIRE DETECTOR	M	L	M	H	4	A
C133	20	(NO. 11 A TRAN-F S)	NO. 11 A TRAN-FIRE SYS OPERATED	M	L	M	H	4	A
C133	20	(NO. 11 A TRAN-LO A)	NO. 11 A TRAN-TROUBLE LOW AIR	M	L	M	H	4	A
C133	20	(TURB GEN-F S)	TURBINE SEAL OIL-FIRE SYS OPERAT	M	L	M	H	4	A
C133	20	(TURB LUBE OIL-F S)	TURBINE LUBE OIL-FIRE SYS OPER	M	L	M	H	4	A
C133	25	8044W	HIGH TEMP MODE	M	L	H	M	4	A
C133	25	8044X	POST SCRAM MODE	M	L	H	M	4	A
C133	25	8044Y	4 FAN MODE	M	L	H	M	4	A
C133	25	8044Z	SHUTDOWN MODE	M	L	H	M	4	A
C133	25	8045A	LOW FLOW	M	L	H	M	4	A
C133	25	8045B	LOW FLOW	M	L	H	M	4	A
C133	25	8045C	LOW FLOW	M	L	H	M	4	A
C133	25	8045D	LOW FLOW	M	L	H	M	4	A
C133	25	8045E	HIGH FLOW	M	L	H	M	4	A
C133	25	8045F	HIGH FLOW	M	L	H	M	4	A
C133	25	8045G	HIGH FLOW	M	L	H	M	4	A
C133	25	8045H	HIGH FLOW	M	L	H	M	4	A
C133	31	(345 KV BKRS AUX RL)	345 KV BREAKERS AUX RELAY DC MON	M	L	L	L	5	A
C133	31	(345 KV BKRS AUX RL)	345 KV BREAKERS AUX RELAY DC MON	M	L	L	L	5	A
C133	31	(ANTI-MOTOR CIRCUIT)	ANTI-MOTOR CIRCUIT DC MONITOR	M	L	L	L	5	A
C133	37	(APRM CL1:1B-28-45)	APRM CHANNEL 1:1B-28-45	M	L	M	M	5	A
C133	37	(APRM CL1:2B-12-29)	APRM CHANNEL 1:2B-12-29	M	L	M	M	5	A
C133	37	(APRM CL1:2C-20-37)	APRM CHANNEL 1:2C-20-37	M	L	M	M	5	A
C133	37	(APRM CL1:3A-36-37)	APRM CHANNEL 1:3A-36-37	M	L	M	M	5	A
C133	37	(APRM CL1:3B-44-29)	APRM CHANNEL 1:3B-44-29	M	L	M	M	5	A
C133	37	(APRM CL1:3D-28-29)	APRM CHANNEL 1:3D-28-29	M	L	M	M	5	A
C133	37	(APRM CL1:4A-20-21)	APRM CHANNEL 1:4A-20-21	M	L	M	M	5	A
C133	37	(APRM CL1:4B-28-13)	APRM CHANNEL 1:4B-28-13	M	L	M	M	5	A
C133	37	(APRM CL1:4D-12-13)	APRM CHANNEL 1:4D-12-13	M	L	M	M	5	A
C133	37	(APRM CL1:5C-36-21)	APRM CHANNEL 1:5C-36-21	M	L	M	M	5	A
C133	37	(APRM CL1:BYPASS)	APRM CHANNEL 1:BYPASS	M	L	M	M	5	A
C133	37	(APRM CL1:DNSCL)	APRM CHANNEL 1:DNSCL	M	L	M	M	5	A

C133 37	(APRM CL1:HI-HI)	APRM CHANNEL 1:HI-HI	M	L	M	M	5	A
C133 37	(APRM CL1:HIGH)	APRM CHANNEL 1:HIGH	M	L	M	M	5	A
C133 37	(APRM CL2:1C-28-45)	APRM CHANNEL 2:1C-28-45	M	L	M	M	5	A
C133 37	(APRM CL2:2C-12-29)	APRM CHANNEL 2:2C-12-29	M	L	M	M	5	A
C133 37	(APRM CL2:2D-20-37)	APRM CHANNEL 2:2D-20-37	M	L	M	M	5	A
C133 37	(APRM CL2:3A-28-29)	APRM CHANNEL 2:3A-28-29	M	L	M	M	5	A
C133 37	(APRM CL2:3B-36-37)	APRM CHANNEL 2:3B-36-37	M	L	M	M	5	A
C133 37	(APRM CL2:3C-44-29)	APRM CHANNEL 2:3C-44-29	M	L	M	M	5	A
C133 37	(APRM CL2:4A-12-13)	APRM CHANNEL 2:4A-12-13	M	L	M	M	5	A
C133 37	(APRM CL2:4C-28-13)	APRM CHANNEL 2:4C-28-13	M	L	M	M	5	A
C133 37	(APRM CL2:5D-36-21)	APRM CHANNEL 2:5D-36-21	M	L	M	M	5	A
C133 37	(APRM CL2:BYPASS)	APRM CHANNEL 2:BYPASS	M	L	M	M	5	A
C133 37	(APRM CL2:DNSCL)	APRM CHANNEL 2:DNSCL	M	L	M	M	5	A
C133 37	(APRM CL2:HI-HI)	APRM CHANNEL 2:HI-HI	M	L	M	M	5	A
C133 37	(APRM CL2:HIGH)	APRM CHANNEL 2:HIGH	M	L	M	M	5	A
C133 37	(APRM CL3:1D-28-45)	APRM CHANNEL 3:1D-28-45	M	L	M	M	5	A
C133 37	(APRM CL3:2A-20-37)	APRM CHANNEL 3:2A-20-37	M	L	M	M	5	A
C133 37	(APRM CL3:2D-12-29)	APRM CHANNEL 3:2D-12-29	M	L	M	M	5	A
C133 37	(APRM CL3:3B-28-29)	APRM CHANNEL 3:3B-28-29	M	L	M	M	5	A
C133 37	(APRM CL3:3C-36-37)	APRM CHANNEL 3:3C-36-37	M	L	M	M	5	A
C133 37	(APRM CL3:3D-44-29)	APRM CHANNEL 3:3D-44-29	M	L	M	M	5	A
C133 37	(APRM CL3:4B-12-13)	APRM CHANNEL 3:4B-12-13	M	L	M	M	5	A
C133 37	(APRM CL3:4C-20-21)	APRM CHANNEL 3:4C-20-21	M	L	M	M	5	A
C133 37	(APRM CL3:5A-36-21)	APRM CHANNEL 3:5A-36-21	M	L	M	M	5	A
C133 37	(APRM CL3:BYPASS)	APRM CHANNEL 3:BYPASS	M	L	M	M	5	A
C133 37	(APRM CL3:DNSCL)	APRM CHANNEL 3:DNSCL	M	L	M	M	5	A
C133 37	(APRM CL3:HI-HI)	APRM CHANNEL 3:HI-HI	M	L	M	M	5	A
C133 37	(APRM CL3:HIGH)	APRM CHANNEL 3:HIGH	M	L	M	M	5	A
C133 37	(APRM CL4:1D-20-45)	APRM CHANNEL 4:1D-20-45	M	L	M	M	5	A
C133 37	(APRM CL4:2A-12-37)	APRM CHANNEL 4:2A-12-37	M	L	M	M	5	A
C133 37	(APRM CL4:2B-36-45)	APRM CHANNEL 4:2B-36-45	M	L	M	M	5	A
C133 37	(APRM CL4:3A-44-37)	APRM CHANNEL 4:3A-44-37	M	L	M	M	5	A
C133 37	(APRM CL4:3B-20-29)	APRM CHANNEL 4:3B-20-29	M	L	M	M	5	A
C133 37	(APRM CL4:3C-28-37)	APRM CHANNEL 4:3C-28-37	M	L	M	M	5	A
C133 37	(APRM CL4:3D-04-29)	APRM CHANNEL 4:3D-04-29	M	L	M	M	5	A
C133 37	(APRM CL4:4A-28-21)	APRM CHANNEL 4:4A-28-21	M	L	M	M	5	A
C133 37	(APRM CL4:4C-12-21)	APRM CHANNEL 4:4C-12-21	M	L	M	M	5	A
C133 37	(APRM CL4:5C-44-21)	APRM CHANNEL 4:5C-44-21	M	L	M	M	5	A
C133 37	(APRM CL4:5D-20-13)	APRM CHANNEL 4:5D-20-13	M	L	M	M	5	A
C133 37	(APRM CL4:6B-36-13)	APRM CHANNEL 4:6B-36-13	M	L	M	M	5	A
C133 37	(APRM CL4:6C-28-05)	APRM CHANNEL 4:6C-28-05	M	L	M	M	5	A
C133 37	(APRM CL4:BYPASS)	APRM CHANNEL 4:BYPASS	M	L	M	M	5	A
C133 37	(APRM CL4:DNSCL)	APRM CHANNEL 4:DNSCL	M	L	M	M	5	A
C133 37	(APRM CL4:HI-HI)	APRM CHANNEL 4:HI-HI	M	L	M	M	5	A

C133 37	(APRM CL4:HIGH)	APRM CHANNEL 4:HIGH	M	L	M	M	5	A
C133 37	(APRM CL5:2B-12-37)	APRM CHANNEL 5:2B-12-37	M	L	M	M	5	A
C133 37	(APRM CL5:2C-36-45)	APRM CHANNEL 5:2C-36-45	M	L	M	M	5	A
C133 37	(APRM CL5:3A-04-29)	APRM CHANNEL 5:3A-04-29	M	L	M	M	5	A
C133 37	(APRM CL5:3B-44-37)	APRM CHANNEL 5:3B-44-37	M	L	M	M	5	A
C133 37	(APRM CL5:3C-20-29)	APRM CHANNEL 5:3C-20-29	M	L	M	M	5	A
C133 37	(APRM CL5:3D-28-37)	APRM CHANNEL 5:3D-28-37	M	L	M	M	5	A
C133 37	(APRM CL5:4A-36-29)	APRM CHANNEL 5:4A-36-29	M	L	M	M	5	A
C133 37	(APRM CL5:4B-28-21)	APRM CHANNEL 5:4B-28-21	M	L	M	M	5	A
C133 37	(APRM CL5:4D-12-21)	APRM CHANNEL 5:4D-12-21	M	L	M	M	5	A
C133 37	(APRM CL5:5A-20-13)	APRM CHANNEL 5:5A-20-13	M	L	M	M	5	A
C133 37	(APRM CL5:5D-44-21)	APRM CHANNEL 5:5D-44-21	M	L	M	M	5	A
C133 37	(APRM CL5:6C-36-13)	APRM CHANNEL 5:6C-36-13	M	L	M	M	5	A
C133 37	(APRM CL5:6D-28-05)	APRM CHANNEL 5:6D-28-05	M	L	M	M	5	A
C133 37	(APRM CL5:BYPASS)	APRM CHANNEL 5:BYPASS	M	L	M	M	5	A
C133 37	(APRM CL5:DNSCL)	APRM CHANNEL 5:DNSCL	M	L	M	M	5	A
C133 37	(APRM CL5:HI-HI)	APRM CHANNEL 5:HI-HI	M	L	M	M	5	A
C133 37	(APRM CL5:HIGH)	APRM CHANNEL 5:HIGH	M	L	M	M	5	A
C133 37	(APRM CL6:1B-20-45)	APRM CHANNEL 6:1B-20-45	M	L	M	M	5	A
C133 37	(APRM CL6:2C-12-37)	APRM CHANNEL 6:2C-12-37	M	L	M	M	5	A
C133 37	(APRM CL6:2D-36-45)	APRM CHANNEL 6:2D-36-45	M	L	M	M	5	A
C133 37	(APRM CL6:3A-28-37)	APRM CHANNEL 6:3A-28-37	M	L	M	M	5	A
C133 37	(APRM CL6:3B-04-29)	APRM CHANNEL 6:3B-04-29	M	L	M	M	5	A
C133 37	(APRM CL6:3C-44-37)	APRM CHANNEL 6:3C-44-37	M	L	M	M	5	A
C133 37	(APRM CL6:3D-20-29)	APRM CHANNEL 6:3D-20-29	M	L	M	M	5	A
C133 37	(APRM CL6:4A-12-21)	APRM CHANNEL 6:4A-12-21	M	L	M	M	5	A
C133 37	(APRM CL6:4B-30-29)	APRM CHANNEL 6:4B-30-29	M	L	M	M	5	A
C133 37	(APRM CL6:4C-28-21)	APRM CHANNEL 6:4C-28-21	M	L	M	M	5	A
C133 37	(APRM CL6:5A-44-21)	APRM CHANNEL 6:5A-44-21	M	L	M	M	5	A
C133 37	(APRM CL6:5B-20-13)	APRM CHANNEL 6:5B-20-13	M	L	M	M	5	A
C133 37	(APRM CL6:6A-28-05)	APRM CHANNEL 6:6A-28-05	M	L	M	M	5	A
C133 37	(APRM CL6:6D-36-13)	APRM CHANNEL 6:6D-36-13	M	L	M	M	5	A
C133 37	(APRM CL6:BYPASS)	APRM CHANNEL 6:BYPASS	M	L	M	M	5	A
C133 37	(APRM CL6:DNSCL)	APRM CHANNEL 6:DNSCL	M	L	M	M	5	A
C133 37	(APRM CL6:HI-HI)	APRM CHANNEL 6:HI-HI	M	L	M	M	5	A
C133 37	(APRM CL6:HIGH)	APRM CHANNEL 6:HIGH	M	L	M	M	5	A
C133 37	(LPRM GRP1:1A-28-45)	LPRM GRP1:1A-28-45	M	L	M	M	5	A
C133 37	(LPRM GRP1:2A-12-29)	LPRM GRP1:2A-12-29	M	L	M	M	5	A
C133 37	(LPRM GRP1:2B-20-37)	LPRM GRP1:2B-20-37	M	L	M	M	5	A
C133 37	(LPRM GRP1:3A-44-29)	LPRM GRP1:3A-44-29	M	L	M	M	5	A
C133 37	(LPRM GRP1:3C-28-29)	LPRM GRP1:3C-28-29	M	L	M	M	5	A
C133 37	(LPRM GRP1:3D-36-37)	LPRM GRP1:3D-36-37	M	L	M	M	5	A
C133 37	(LPRM GRP1:4A-28-13)	LPRM GRP1:4A-28-13	M	L	M	M	5	A
C133 37	(LPRM GRP1:4C-12-13)	LPRM GRP1:4C-12-13	M	L	M	M	5	A

C133	37	(LPRM GRP1:4D-20-21)	LPRM GRP1:4D-20-21	M	L	M	M	5	A
C133	37	(LPRM GRP1:5B-36-21)	LPRM GRP1:5B-36-21	M	L	M	M	5	A
C133	37	(LPRM GRP1:COMP)	LPRM GRP1:COMP)	M	L	M	M	5	A
C133	37	(LPRM GRP1:UPS/INOP)	LPRM GRP1:UPS/INOP	M	L	M	L	5	A
C133	37	(LPRM GRP2:1C-20-45)	LPRM GRP2:1C-20-45	M	L	M	M	5	A
C133	37	(LPRM GRP2:2A-36-45)	LPRM GRP2:2A-36-45	M	L	M	M	5	A
C133	37	(LPRM GRP2:2D-12-37)	LPRM GRP2:2D-12-37	M	L	M	M	5	A
C133	37	(LPRM GRP2:3A-20-29)	LPRM GRP2:3A-20-29	M	L	M	M	5	A
C133	37	(LPRM GRP2:3B-28-37)	LPRM GRP2:3B-28-37	M	L	M	M	5	A
C133	37	(LPRM GRP2:3C-04-29)	LPRM GRP2:3C-04-29	M	L	M	M	5	A
C133	37	(LPRM GRP2:3D-44-37)	LPRM GRP2:3D-44-37	M	L	M	M	5	A
C133	37	(LPRM GRP2:4B-12-21)	LPRM GRP2:4B-12-21	M	L	M	M	5	A
C133	37	(LPRM GRP2:4C-36-29)	LPRM GRP2:4C-36-29	M	L	M	M	5	A
C133	37	(LPRM GRP2:4D-28-21)	LPRM GRP2:4D-28-21	M	L	M	M	5	A
C133	37	(LPRM GRP2:5B-44-21)	LPRM GRP2:5B-44-21	M	L	M	M	5	A
C133	37	(LPRM GRP2:5C-20-13)	LPRM GRP2:5C-20-13	M	L	M	M	5	A
C133	37	(LPRM GRP2:6A-36-13)	LPRM GRP2:6A-36-13	M	L	M	M	5	A
C133	37	(LPRM GRP2:6B-28-05)	LPRM GRP2:6B-28-05	M	L	M	M	5	A
C133	37	(LPRM GRP2:COMP)	LPRM GRP2:COMP	M	L	M	M	5	A
C133	37	(LPRM GRP2:UPS/INOP)	LPRM GRP2:UPS/INOP	M	L	M	M	5	A
C133	37	(RBM CL7:BYPASS)	RBM CHANNEL 7:BYPASS	M	L	M	M	5	A
C133	37	(RBM CL7:COMP)	RBM CHANNEL 7:COMP	M	L	M	M	5	A
C133	37	(RBM CL7:EDGE ROD S)	RBM CHANNEL 7:EDGE ROD S	M	L	M	M	5	A
C133	37	(RBM CL7:HIGH)	RBM CHANNEL 7:HIGH	M	L	M	M	5	A
C133	37	(RBM CL7:NO BALANCE)	RBM CHANNEL 7:NO BALANCE	M	L	M	M	5	A
C133	37	(RBM CL7:NO ROD SL)	RBM CHANNEL 7:NO ROD SL	M	L	M	M	5	A
C133	37	(RBM CL7:RBM DNSCL)	RBM CHANNEL 7:RBM DNSCL	M	L	M	M	5	A
C133	37	(RBM CL7:REF. DNSCL)	RBM CHANNEL 7:REF. DNSCL	M	L	M	M	5	A
C133	37	(RBM CL7:ROD OUT IN)	RBM CHANNEL 7:ROD OUT IN	M	L	M	M	5	A
C133	37	(RBM CL7:TRIP INH)	RBM CHANNEL 7:TRIP INH	M	L	M	M	5	A
C133	37	(RBM CL7:UPS/INOP)	RBM CHANNEL 7:UPS/INOP	M	L	M	M	5	A
C133	37	(RBM CL7:UPSCL/INOP)	RBM CHANNEL 7:UPSCL/INOP	M	L	M	M	5	A
C133	37	(RBM CL8:BYPASS)	RBM CHANNEL 8:BYPASS	M	L	M	M	5	A
C133	37	(RBM CL8:COMP)	RBM CHANNEL 8:COMP	M	L	M	M	5	A
C133	37	(RBM CL8:EDGE ROD S)	RBM CHANNEL 8:EDGE ROD S	M	L	M	M	5	A
C133	37	(RBM CL8:HIGH)	RBM CHANNEL 8:HIGH	M	L	M	M	5	A
C133	37	(RBM CL8:NO BALANCE)	RBM CHANNEL 8:NO BALANCE	M	L	M	M	5	A
C133	37	(RBM CL8:NO ROD SL)	RBM CHANNEL 8:NO ROD SL	M	L	M	M	5	A
C133	37	(RBM CL8:RBM DNSCL)	RBM CHANNEL 8:RBM DNSCL	M	L	M	M	5	A
C133	37	(RBM CL8:REF. DNSCL)	RBM CHANNEL 8:REF. DNSCL	M	L	M	M	5	A
C133	37	(RBM CL8:ROD OUT IN)	RBM CHANNEL 8:ROD OUT IN	M	L	M	M	5	A
C133	37	(RBM CL8:TRIP INH)	RBM CHANNEL 8:TRIP INH	M	L	M	M	5	A
C133	37	(RBM CL8:UPSCL/INOP)	RBM CHANNEL 8:UPSCL/INOP	M	L	M	M	5	A
C133	24A	(DLTN AIR LOW FLOW)	DILUTION AIR LOW FLOW	M	L	L	M	4	A

C133 24A	(OVERTEMP)	AIR HEATER OVERTEMP LIGHT	M	L	H	M	4	A
C133 24B	(DLTN AIR LOW FLOW)	DILUTION AIR LOW FLOW	M	L	L	H	4	A
C133 24B	(OVERTEMP)	AIR HEATER OVERTEMP LIGHT	M	L	H	M	4	A
C133 257	(RM 7860 (OPERATE))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 257	(RM 7860 (TRIP 1))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 257	(RM 7860 (TRIP 2))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 257	(RM 9021A (TRIP 1))	EFT BLDG VENT RAD STATUS LIGHT	M	L	H	L	4	A
C133 257	(RM 9021A (TRIP 2))	EFT BLDG VENT RAD STATUS LIGHT	M	L	H	L	4	A
C133 258	(RM 7860 (OPERATE))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 258	(RM 7860 (TRIP 1))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 258	(RM 7860 (TRIP 2))	DRYWELL CH A HI RANGE RAD LIGHT	M	L	H	L	4	A
C133 258	(RM 9021B (OPERATE))	EFT BLDG VENT RAD STATUS LIGHT	M	L	H	L	4	A
C133 258	(RM 9021B (TRIP 1))	EFT BLDG VENT RAD STATUS LIGHT	M	L	H	L	4	A
C133 258	(RM 9021B (TRIP 2))	EFT BLDG VENT RAD STATUS LIGHT	M	L	H	L	4	A
C133 259	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	M	L	M	M	5	A
C133 259	(HEATER ON)	CH A CONT ATM ANALYZER-HEATER ON	M	L	M	M	5	A
C133 259	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	M	L	M	M	5	A
C133 259	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	M	L	M	M	5	A
C133 259	(POWER ON)	CH A CTM ATM ANALZ-POWER ON	M	L	M	M	5	A
C133 259	(SAMPLE LINE HTG ON)	CAM ISOL VALVE CH A LIGHT	M	L	M	M	5	A
C133 260	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	M	L	M	M	5	A
C133 260	(HEATER ON)	CH A CONT ATM ANALYZER-HEATER ON	M	L	M	M	5	A
C133 260	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	M	L	M	M	5	A
C133 260	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	M	L	M	M	5	A
C133 260	(POWER ON)	CH A CTM ATM ANALZ-POWER ON	M	L	M	M	5	A
C133 260	(SAMPLE LINE HTG ON)	CAM ISOL VALVE CH A LIGHT	M	L	M	M	5	A
C133 263A	(SPR(14 LGTS-C263A))	SPARE LIGHTS	M	L	M	H	4	A
C133 263A	(V-D-9052A (GRN))	V-EAC-14A RETURN AIR	M	L	M	L	5	A
C133 263A	(V-D-9052A (RED))	V-EAC-14A RETURN AIR	M	L	M	L	5	A
C133 263A	(V-D-9094A (GRN))	V-ERF-11 TSC SUPPLY	M	L	M	L	5	A
C133 263A	(V-D-9094A (RED))	V-ERF-11 TSC SUPPLY	M	L	M	L	5	A
C133 263A	(V-D-9111A (GRN))	V-ERF-11 DISCH	M	L	M	M	5	A
C133 263A	(V-D-9111A (RED))	V-ERF-11 DISCH	M	L	M	M	5	A
C133 263A	(V-D-9175A (GRN))	V-ERF-14A CONTROL	M	L	M	L	5	A
C133 263A	(V-D-9175A (RED))	V-ERF-14A CONTROL	M	L	M	L	5	A
C133 263A	(V-D-9176A (GRN))	V-ERF-14A EXHAUST ISOL	M	L	M	H	4	A
C133 263A	(V-D-9176A (RED))	V-ERF-14A EXHAUST ISOL	M	L	M	H	4	A
C133 263A	(V-D-9215A (GRN))	3RD FLOOR EFT SUPPLY AIR	M	L	L	L	5	A
C133 263A	(V-D-9215A (RED))	3RD FLOOR EFT SUPPLY AIR	M	L	L	L	5	A
C133 263A	(V-D-9216A (GRN))	V-EAC-14A OUTSIDE AIR	M	L	M	L	5	A
C133 263A	(V-D-9216A (RED))	V-EAC-14A OUTSIDE AIR	M	L	M	L	5	A
C133 264B	(SPR(14 LGTS-C264B))	SPARE LIGHTS	M	L	M	H	4	A
C133 264B	(V-D-9052B (GRN))	V-EAC-14B RETURN AIR	M	L	M	L	5	A
C133 264B	(V-D-9052B (RED))	V-EAC-14B RETURN AIR	M	L	M	L	5	A

C133 264B	(V-D-9092B (GRN))	V-EAC-14B TSC SUPPLY	M	L	M	L	5	A
C133 264B	(V-D-9092B (RED))	V-EAC-14B TSC SUPPLY	M	L	M	L	5	A
C133 264B	(V-D-9093B (GRN))	V-EAC-14B CONT ROOM SUPPLY	M	L	H	H	4	A
C133 264B	(V-D-9093B (RED))	V-EAC-14B CONT ROOM SUPPLY	M	L	H	H	4	A
C133 264B	(V-D-9094B (GRN))	V-ERF-12 TSC SUPPLY	M	L	M	L	5	A
C133 264B	(V-D-9094B (RED))	V-ERF-12 TSC SUPPLY	M	L	M	L	5	A
C133 264B	(V-D-9111B (GRN))	V-ERF-12 DISCH	M	L	M	M	5	A
C133 264B	(V-D-9111B (RED))	V-ERF-12 DISCH	M	L	M	M	5	A
C133 264B	(V-D-9175B (GRN))	V-ERF-14B CONTROL	M	L	M	L	5	A
C133 264B	(V-D-9175B (RED))	V-ERF-14B CONTROL	M	L	M	L	5	A
C133 264B	(V-D-9176B (GRN))	V-ERF-14B EXHAUST AIR	M	L	M	H	4	A
C133 264B	(V-D-9176B (RED))	V-ERF-14B EXHAUST AIR	M	L	M	H	4	A
C133 264B	(V-D-9177B (GRN))	V-ERF-14B TSC RETURN	M	L	M	L	5	A
C133 264B	(V-D-9177B (RED))	V-ERF-14B TSC RETURN	M	L	M	L	5	A
C133 264B	(V-D-9178B (GRN))	V-ERF-14B CONT ROOM RETURN	M	L	H	H	4	A
C133 264B	(V-D-9178B (RED))	V-ERF-14B CONT ROOM RETURN	M	L	H	H	4	A
C133 264B	(V-D-9212B (GRN))	EFT BATT ROOM SUPPLY	M	L	L	M	5	A
C133 264B	(V-D-9212B (RED))	EFT BATT ROOM SUPPLY	M	L	L	M	5	A
C133 264B	(V-D-9212B (RED))	EFT BATT ROOM SUPPLY	M	L	L	M	5	A
C133 264B	(V-D-9214B (GRN))	3RD FLOOR EFT SUPPLY AIR	M	L	L	L	5	A
C133 264B	(V-D-9214B (RED))	3RD FLOOR EFT SUPPLY AIR	M	L	L	L	5	A
C133 264B	(V-D-9215B (GRN))	3RD FLOOR EFT RETURN AIR	M	L	L	L	5	A
C133 264B	(V-D-9215B (RED))	3RD FLOOR EFT RETURN AIR	M	L	L	L	5	A
C133 264B	(V-D-9216B (GRN))	V-EAC-14B OUTSIDE AIR	M	L	M	L	5	A
C133 264B	(V-D-9216B (RED))	V-EAC-14B OUTSIDE AIR	M	L	M	L	5	A
C133 13	(F5 CONT ISOL-CL 3)	FUSE ON VALVE CNTL CL 3	M	L	L	L	5	B
C133 13	(F5 CONT ISOL-CL1,2)	FUSE ON VALVE CNTL CL 1 AND CL 2	M	L	L	L	5	B
C133 13	1-DS1	DRIVE CONTROL CHANNEL 1:READY	M	L	L	L	5	B
C133 13	1-DS11	VALVE CONTROL CHANNEL 1:SQUIB MO	M	L	H	L	4	B
C133 13	1-DS12	VALVE CONTROL CHANNEL 1:SHEAR VL	M	L	L	L	5	B
C133 13	1-DS15	VALVE CONTROL CHANNEL 1:TIME DEL	M	L	H	L	4	B
C133 13	1-DS3	DRIVE CONTROL CHANNEL 1:IN-CORE	M	L	L	L	5	B
C133 13	1-DS4	DRIVE CONTROL CHANNEL 1:IN-SHIEL	M	L	L	H	4	B
C133 13	2-DS1	DRIVE CONTROL CHANNEL 2:READY	M	L	L	L	5	B
C133 13	2-DS21	VALVE CONTROL CHANNEL 2:SQUIB MO	M	L	L	L	5	B
C133 13	2-DS22	VALVE CONTROL CHANNEL 2:SHEAR VL	M	L	L	L	5	B
C133 13	2-DS25	VALVE CONTROL CHANNEL 2:TIME DEL	M	L	L	L	5	B
C133 13	2-DS3	DRIVE CONTROL CHANNEL 2:IN-CORE	M	L	L	L	5	B
C133 13	2-DS4	DRIVE CONTROL CHANNEL 2:IN-SHIEL	M	L	L	H	4	B
C133 13	3-DS1	DRIVE CONTROL CHANNEL 3:READY	M	L	L	L	5	B
C133 13	3-DS3	DRIVE CONTROL CHANNEL 3:IN-CORE	M	L	L	L	5	B
C133 13	3-DS4	DRIVE CONTROL CHANNEL 3:IN-SHIEL	M	L	L	H	4	B
C133 252A	(COMPRESSOR 11 LOAD)	COMPRESSOR 11 LOAD	M	L	M	L	5	C
C133 252A	(COMPRESSOR 12 LOAD)	COMPRESSOR 11 LOAD	M	L	M	L	5	C

C133	252A	(HCV 7583 (OPEN))	HCV 7583 STATUS	M	L	M	H	4	C
C133	252D	RI 7571A (HIGH)	RECOMBINER BLDG INSTRUMENT ROOM	M	L	M	L	5	C
C133	252D	RI 7571A (LOW)	RECOMBINER BLDG INSTRUMENT ROOM	M	L	M	L	5	C
C133	252D	RI 7571B (HIGH)	RECOMBINER BLDG PUMP ROOM	M	L	M	L	5	C
C133	252D	RI 7571B (LOW)	RECOMBINER BLDG PUMP ROOM	M	L	M	L	5	C
C133	252D	RI 7612 (HIGH)	STORAGE BUILDING	M	L	M	L	5	C
C133	252D	RI 7612 (LOW)	STORAGE BUILDING	M	L	M	L	5	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C133		Monticello does not intend to correct these discrepancies. A review of the devices identified in the HED reveal that these lights fall into the following categories: 1) Lights that are normally off and are illuminated when a trip signal is generated and are checked during surveillance/functional testing and/or have backup indication available. 2) Lights that are always illuminated. If these lights are out a CR operator would suspect a burned out bulb unless a fuse was pulled to disable the device. Under these conditions the CR operator would be aware of this device being disabled. 3) Infrequently used system, used for special purposes, such as Traversing Incore Probe (TIP) system. 4) Devices associated with systems that do not have a significant impact on operation of the plant. In all cases, Monticello feels that present design, using a single indicator to show status, is adequate.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C139	6.5.3.1(c)(1)	INDICATOR LIGHT	System status should be inferred by illumination, not its absence. Equipment status should be unambiguous.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C139	3	16A DS200	INBD MSIV SOL VLV PWR	L	H	H	M	3	A
C139	3	16A DS201	SV 4001A POSITION IND	L	H	H	M	3	A
C139	3	16A DS202	SV 4001A POSITION IND	L	H	H	M	3	A
C139	3	16A DS203	SV 4020A POSITION IND	L	H	H	M	3	A
C139	4	2A DS32A	SEAL LEAKOFF BLOCK VALVE	H	H	L	M	1	A
C139	4	2A DS32B	SEAL LEAKOFF BLOCK VALVE	H	H	L	M	1	A
C139	4	2A DS33A	RECIRCULATION MG SET A	H	H	L	M	1	A
C139	4	2A DS33B	RECIRCULATION MG SET B	H	H	L	M	1	A
C139	4	2A DS3A	GEN LOCK OUT BUS P.S.A.	H	H	L	L	1	A
C139	4	2A DS3B	GEN LOCKOUT BUS P.S.B.	H	H	L	L	1	A
C139	5	11A-DS1A	PUMP RUNNING 11-2A	L	H	H	H	3	A
C139	5	11A-DS1B	PUMP RUNNING 11-2B	L	H	H	H	3	A
C139	5	11A-DS2A	SQUIB VALVE READY 11-14A	L	H	H	H	3	A
C139	5	11A-DS2B	SQUIB VALVE READY 11-14B	L	H	H	H	3	A
C139	5	3A-DS1	ROD OUT PERMIT	L	H	M	L	3	A
C139	5	3A-DS2	2 SEC SELECT	L	H	M	L	3	A
C139	5	3A-DS5	ROD OUT SETTLE	L	H	M	L	3	A
C139	5	3A-DS7	REFUEL MODE ONE ROD PERMISSIVE	L	H	M	M	3	A
C139	5	3A-DS9	2 SEC SELECT	L	H	L	L	4	A
C139	5	DS1A	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C139	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	A
C139	6	M476 235C	LOW FLOW	H	H	L	M	1	A
C139	6	M476 235D	HIGH FLOW	H	H	L	M	1	A
C139	6	M476 236C	LOW FLOW	H	H	L	M	1	A
C139	6	M476 236D	HIGH FLOW	H	H	L	M	1	A
C139	6	M476-10C	#12 COND. PUMP LARGE MOTOR MON.	L	H	M	H	3	A
C139	6	M476-157C	#11 CLG TOWER - LARGE MOTOR MON.	L	H	L	M	3	A
C139	6	M476-158C	#12 CLG TOWER - LARGE MOTOR MON	L	H	L	M	3	A
C139	6	M476-1C	#11 RFP LARGE MOTOR MONITOR	L	H	M	H	3	A
C139	6	M476-241C	PUMP 11 LARGE MOTOR MONITOR	H	H	L	L	1	A
C139	6	M476-242C	#12 CIRC.WTR PUMP LRG. MOTOR MON	L	H	M	M	3	A
C139	6	M476-244C	COND. AIR VENT AUTO-SETUP	L	H	M	M	3	A
C139	6	M476-245C	COND. AIR VENT AUTO-SETUP	L	H	M	M	3	A
C139	6	M476-2C	#12 RFP LARGE MOTOR MONITOR	L	H	M	H	3	A
C139	6	M476-9C	--	L	H	M	H	3	A
C139	7	HS-1083	AIR EJECTORS SUCT ISOLATION VALV	L	H	M	M	3	A
C139	7	MTS-1	VACUUM TRIP 1	L	H	L	L	4	A
C139	7	MTS-2	VACUUM TRIP 2	L	H	L	L	4	A
C139	8	(PWR SYS SBLR-LIGHT)	POWER SYSTEM STABILIZER	L	H	L	L	4	A
C139	8	(SYNCHRONIZING)		L	H	L	H	3	A
C139	2	(STACK RAD)	STACK RADIATION	L	H	M	M	3	A
C139	10			H	M	-	-	1	A
C139	10	17-150A	OFF GAS CH 1	L	M	H	H	4	A
C139	10	17-150B	OFF GAS CH 2	L	M	H	H	4	A
C139	10	17-251A	MAIN STEAM LINE CHANNEL A	L	M	H	H	4	A
C139	10	17-251B	MAIN STEAM LINE CHANNEL B	L	M	H	H	4	A
C139	10	17-251C	MAIN STEAM LINE CHANNEL C	L	M	H	H	4	A
C139	10	17-251D	MAIN STEAM LINE CHANNEL D	L	M	H	H	4	A
C139	10	17-351	SERVICE WATER EFFLUENT	L	M	H	H	4	A
C139	10	17-352	CLOSED COOLING WATER EFFLUENT	L	M	M	M	4	A
C139	10	17-357A	DISCHARGE CANAL MONITOR A	L	M	H	H	4	A
C139	10	17-357B	DISCHARGE CANAL MONITOR B	L	M	H	H	4	A
C139	10	17-451A	POWER SUPPLY PROCESS MON	L	M	H	L	4	A
C139	10	17-451B	POWER SUPPLY PROCESS MON	L	M	H	L	4	A
C139	10	17-452A	REACTOR BLDG EXH PLENUM CH 1	L	M	H	H	4	A

C139 10	17-452B	REACTOR BLDG EXH PLENUM CH 2	L	M	H	H	4	A
C139 10	17-453A	SPENT FUEL POOL CHANNEL A	L	M	H	H	4	A
C139 10	17-453B	SPENT FUEL CHANNEL B	L	M	H	H	4	A
C139 10	17-454	CONTROL ROOM AIR INTAKE	L	M	H	M	4	A
C139 11	18-50	CONTROL ROOM LOW RANGE AREA MON	L	M	H	L	4	A
C139 11	18-51A	REFUEL FLOOR LOW RANGE AREA MON	L	M	H	L	4	A
C139 11	18-51B	REFUEL FLOOR STAIRWAY AREA MON	L	M	H	L	4	A
C139 11	18-51C	NEW FUEL STORAGE VAULT AREA MON	L	M	H	L	4	A
C139 11	18-51D	CONTAMINATED EQUIPMENT AREA MON	L	M	H	L	4	A
C139 11	18-51E	CONTAMINATED STORAGE AREA MON	L	M	H	L	4	A
C139 11	18-51F	RADWASTE ACCESS AREA MON	L	M	H	M	4	A
C139 11	18-51G	CLEAN UP SYSTEM AREA ACCESS MON	L	M	H	L	4	A
C139 11	18-51H	CONTROL ROD DR REPAIR AREA MON	L	M	H	L	4	A
C139 11	18-51I	EAST CRD MODULE AREA MON	L	M	H	L	4	A
C139 11	18-51J	WEST CRD MODULE AREA MON	L	M	H	L	4	A
C139 11	18-51K	TIP DRIVE AREA MON	L	M	H	L	4	A
C139 11	18-51L	HPCI TURBINE AREA MON	L	M	H	L	4	A
C139 11	18-51M	CONTROL ROD DRIVE PUMP AREA MON	L	M	H	L	4	A
C139 11	18-51N	RCIC EQUIPMENT AREA MON	L	M	H	L	4	A
C139 11	18-51P	EAST CORE SPRAY & RHR AREA MON	L	M	H	L	4	A
C139 11	18-51Q	WEST CORE SPRAY & RHR AREA MON	L	M	H	L	4	A
C139 11	18-51R	CONTROL LAB AREA MONITOR	L	M	H	L	4	A
C139 11	18-51S	TG FRONT STANDARD AREA MONITOR	L	M	H	L	4	A
C139 11	18-51T	CONDENSATE DEMIN OPERATING AREA	L	M	H	L	4	A
C139 11	18-51U	CONDENSATE SYSTEM AREA MON	L	M	H	L	4	A
C139 11	18-51V	FEEDWATER PUMP AREA MON	L	M	H	L	4	A
C139 11	18-51W	RADWASTE CONTROL ROOM AREA MON	L	M	H	L	4	A
C139 11	18-51X	SAMPLE TANK AREA MON	L	M	H	L	4	A
C139 11	18-51Y	CONVEYOR OPERATING AREA MON	L	M	H	L	4	A
C139 11	18-51Z	MACHINE SHOP AREA MON	L	M	H	L	4	A
C139 11	18-52	REFUEL FLOOR HIGH RANGE AREA MON	L	M	H	L	4	A
C139 11	18-53A	POWER SUPPLY FOR AREA MONITOR	L	M	H	L	4	A
C139 11	18-53B	POWER SUPPLY FOR AREA MONITOR	L	M	H	L	4	A
C139 11	18-53C	POWER SUPPLY FOR AREA MONITOR	L	M	H	L	4	A
C139 11	18-57A	TIP CUBICLE	L	M	H	L	4	A
C139 11	18-57B	CONTROL ROOM HIGH RANGE	L	M	H	L	4	A
C139 11	18-57C	OPERATING FLOOR	L	M	H	L	4	A
C139 11	ES 7774	POWER SUPPLY	L	M	H	L	4	A
C139 20	(11 MG-F S)	11 RECIRC MG SET-FIRE SYSTEM OP	M	L	M	H	4	A
C139 20	(12 MG-F S)	12 RECIRC MG SET-FIRE SYSTEM OP	M	L	M	H	4	A
C139 20	(BLDG SDG-F D)	BUILDING SIDING-FIRE DETEC OP	L	H	M	H	3	A
C139 20	(BLDG SDG-F S)	BUILDING SIDING-FIRE SYSTEM OP	M	L	M	H	4	A
C139 20	(BLDG SDG-LO A)	BUILDING SIDING-TROUBLE-LOW AIR	L	H	M	H	3	A
C139 20	(CR EFT SMOKE ALARM)	CONTROL RM EFT OAI SMOKE ALARM	L	H	H	M	3	A

C139 20	(DIESEL FIREPUMP TR)	DIESEL FIRE PUMP TROUBLE	L	H	H	H	3	A
C139 20	(DIRTY OIL STORE-FS)	DIRTY OIL-FIRE SYSTEM OPERATED	M	L	M	H	4	A
C139 20	(HI D-P HEPA FLTR)	HIGH DP HEPA FILTER	L	H	L	L	4	A
C139 20	(HI D-P ROUGH FLTR)	HIGH DP ROUGHING FILTER	L	H	L	L	4	A
C139 20	(LUBE OIL STOR-F S)	LUBE OIL STORE-FIRE SYS OPERATED	M	L	M	H	4	A
C139 20	(NO. 1 M TRANS-F D)	NO. 1 MAIN TRANS-FIRE DETECTOR	L	H	M	H	3	A
C139 20	(NO. 1 M TRANS-F S)	NO. 1 MAIN TRANS-FIRE SYS OPER	M	L	M	H	4	A
C139 20	(NO. 1 M TRANS-LO A)	NO. 1 MAIN TRANS-TROUBLE LOW AIR	L	H	M	H	3	A
C139 20	(NO. 1 R TRANS-F D)	NO. 1R RESERV TR-FIRE DETECTOR	L	H	M	H	3	A
C139 20	(NO. 1 R TRANS-F S)	NO. 1R RESERV TR-FIRE SYS OPER	M	L	M	H	4	A
C139 20	(NO. 1 R TRANS-LO A)	NO. 1R RESERV TR-TROUBLE LOW AIR	L	H	M	H	3	A
C139 20	(NO. 11 A TRAN-F D)	NO. 11 A TRAN-FIRE DETECTOR	L	H	M	H	3	A
C139 20	(NO. 11 A TRAN-F S)	NO. 11 A TRAN-FIRE SYS OPERATED	M	L	M	H	4	A
C139 20	(NO. 11 A TRAN-LO A)	NO. 11 A TRAN-TROUBLE LOW AIR	L	H	M	H	3	A
C139 20	(TURB GEN-F S)	TURBINE SEAL OIL-FIRE SYS OPERAT	M	L	M	H	4	A
C139 20	(TURB LUBE OIL-F S)	TURBINE LUBE OIL-FIRE SYS OPER	M	L	M	H	4	A
C139 25	8044W	HIGH TEMP MODE	L	H	H	M	3	A
C139 25	8044X	POST SCRAM MODE	L	H	H	M	3	A
C139 25	8044Y	4 FAN MODE	L	H	H	M	3	A
C139 25	8044Z	SHUTDOWN MODE	L	H	H	M	3	A
C139 25	8045A	LOW FLOW	L	H	H	M	3	A
C139 25	8045B	LOW FLOW	L	H	H	M	3	A
C139 25	8045C	LOW FLOW	L	H	H	M	3	A
C139 25	8045D	LOW FLOW	L	H	H	M	3	A
C139 25	8045E	HIGH FLOW	L	H	H	M	3	A
C139 25	8045F	HIGH FLOW	L	H	H	M	3	A
C139 25	8045G	HIGH FLOW	L	H	H	M	3	A
C139 25	8045H	HIGH FLOW	L	H	H	M	3	A
C139 31	(345 KV BKRS AUX RL)	345 KV BREAKERS AUX RELAY DC MON	L	H	L	L	4	A
C139 31	(345 KV BKRS AUX RL)	345 KV BREAKERS AUX RELAY DC MON	L	H	L	L	4	A
C139 31	(ANTI-MOTOR CIRCUIT)	ANTI-MOTOR CIRCUIT DC MONITOR	L	H	L	L	4	A
C139 37	(APRM CL1:1B-28-45)	APRM CHANNEL 1:1B-28-45	L	H	M	M	3	A
C139 37	(APRM CL1:2B-12-29)	APRM CHANNEL 1:2B-12-29	L	H	M	M	3	A
C139 37	(APRM CL1:2C-20-37)	APRM CHANNEL 1:2C-20-37	L	H	M	M	3	A
C139 37	(APRM CL1:3A-36-37)	APRM CHANNEL 1:3A-36-37	L	H	M	M	3	A
C139 37	(APRM CL1:3B-44-29)	APRM CHANNEL 1:3B-44-29	L	H	M	M	3	A
C139 37	(APRM CL1:3D-28-29)	APRM CHANNEL 1:3D-28-29	L	H	M	M	3	A
C139 37	(APRM CL1:4A-20-21)	APRM CHANNEL 1:4A-20-21	L	H	M	M	3	A
C139 37	(APRM CL1:4B-28-13)	APRM CHANNEL 1:4B-28-13	L	H	M	M	3	A
C139 37	(APRM CL1:4D-12-13)	APRM CHANNEL 1:4D-12-13	L	H	M	M	3	A
C139 37	(APRM CL1:5C-36-21)	APRM CHANNEL 1:5C-36-21	L	H	M	M	3	A
C139 37	(APRM CL1:BYPASS)	APRM CHANNEL 1:BYPASS	L	H	M	M	3	A
C139 37	(APRM CL1:DNSCL)	APRM CHANNEL 1:DNSCL	L	H	M	M	3	A
C139 37	(APRM CL1:HI-HI)	APRM CHANNEL 1:HI-HI	L	H	M	M	3	A

C139	37	(APRM CL1:HIGH)	APRM CHANNEL 1:HIGH	L	H	M	M	3	A
C139	37	(APRM CL2:1C-28-45)	APRM CHANNEL 2:1C-28-45	L	H	M	M	3	A
C139	37	(APRM CL2:2C-12-29)	APRM CHANNEL 2:2C-12-29	L	H	M	M	3	A
C139	37	(APRM CL2:2D-20-37)	APRM CHANNEL 2:2D-20-37	L	H	M	M	3	A
C139	37	(APRM CL2:3A-28-29)	APRM CHANNEL 2:3A-28-29	L	H	M	M	3	A
C139	37	(APRM CL2:3B-36-37)	APRM CHANNEL 2:3B-36-37	L	H	M	M	3	A
C139	37	(APRM CL2:3C-44-29)	APRM CHANNEL 2:3C-44-29	L	H	M	M	3	A
C139	37	(APRM CL2:4A-12-13)	APRM CHANNEL 2:4A-12-13	L	H	M	M	3	A
C139	37	(APRM CL2:4C-28-13)	APRM CHANNEL 2:4C-28-13	L	H	M	M	3	A
C139	37	(APRM CL2:5D-36-21)	APRM CHANNEL 2:5D-36-21	L	H	M	M	3	A
C139	37	(APRM CL2:BYPASS)	APRM CHANNEL 2:BYPASS	L	H	M	M	3	A
C139	37	(APRM CL2:DNSCL)	APRM CHANNEL 2:DNSCL	L	H	M	M	3	A
C139	37	(APRM CL2:HI-HI)	APRM CHANNEL 2:HI-HI	L	H	M	M	3	A
C139	37	(APRM CL2:HIGH)	APRM CHANNEL 2:HIGH	L	H	M	M	3	A
C139	37	(APRM CL3:1D-28-45)	APRM CHANNEL 3:1D-28-45	L	H	M	M	3	A
C139	37	(APRM CL3:2A-20-37)	APRM CHANNEL 3:2A-20-37	L	H	M	M	3	A
C139	37	(APRM CL3:2D-12-29)	APRM CHANNEL 3:2D-12-29	L	H	M	M	3	A
C139	37	(APRM CL3:3B-28-29)	APRM CHANNEL 3:3B-28-29	L	H	M	M	3	A
C139	37	(APRM CL3:3C-36-37)	APRM CHANNEL 3:3C-36-37	L	H	M	M	3	A
C139	37	(APRM CL3:3D-44-29)	APRM CHANNEL 3:3D-44-29	L	H	M	M	3	A
C139	37	(APRM CL3:4B-12-13)	APRM CHANNEL 3:4B-12-13	L	H	M	M	3	A
C139	37	(APRM CL3:4C-20-21)	APRM CHANNEL 3:4C-20-21	L	H	M	M	3	A
C139	37	(APRM CL3:5A-36-21)	APRM CHANNEL 3:5A-36-21	L	H	M	M	3	A
C139	37	(APRM CL3:BYPASS)	APRM CHANNEL 3:BYPASS	L	H	M	M	3	A
C139	37	(APRM CL3:DNSCL)	APRM CHANNEL 3:DNSCL	L	H	M	M	3	A
C139	37	(APRM CL3:HI-HI)	APRM CHANNEL 3:HI-HI	L	H	M	M	3	A
C139	37	(APRM CL3:HIGH)	APRM CHANNEL 3:HIGH	L	H	M	M	3	A
C139	37	(APRM CL4:1D-20-45)	APRM CHANNEL 4:1D-20-45	L	H	M	M	3	A
C139	37	(APRM CL4:2A-12-37)	APRM CHANNEL 4:2A-12-37	L	H	M	M	3	A
C139	37	(APRM CL4:2B-36-45)	APRM CHANNEL 4:2B-36-45	L	H	M	M	3	A
C139	37	(APRM CL4:3A-44-37)	APRM CHANNEL 4:3A-44-37	L	H	M	M	3	A
C139	37	(APRM CL4:3B-20-29)	APRM CHANNEL 4:3B-20-29	L	H	M	M	3	A
C139	37	(APRM CL4:3C-28-37)	APRM CHANNEL 4:3C-28-37	L	H	M	M	3	A
C139	37	(APRM CL4:3D-04-29)	APRM CHANNEL 4:3D-04-29	L	H	M	M	3	A
C139	37	(APRM CL4:4A-28-21)	APRM CHANNEL 4:4A-28-21	L	H	M	M	3	A
C139	37	(APRM CL4:4C-12-21)	APRM CHANNEL 4:4C-12-21	L	H	M	M	3	A
C139	37	(APRM CL4:5C-44-21)	APRM CHANNEL 4:5C-44-21	L	H	M	M	3	A
C139	37	(APRM CL4:5D-20-13)	APRM CHANNEL 4:5D-20-13	L	H	M	M	3	A
C139	37	(APRM CL4:6B-36-13)	APRM CHANNEL 4:6B-36-13	L	H	M	M	3	A
C139	37	(APRM CL4:6C-28-05)	APRM CHANNEL 4:6C-28-05	L	H	M	M	3	A
C139	37	(APRM CL4:BYPASS)	APRM CHANNEL 4:BYPASS	L	H	M	M	3	A
C139	37	(APRM CL4:DNSCL)	APRM CHANNEL 4:DNSCL	L	H	M	M	3	A
C139	37	(APRM CL4:HI-HI)	APRM CHANNEL 4:HI-HI	L	H	M	M	3	A
C139	37	(APRM CL4:HIGH)	APRM CHANNEL 4:HIGH	L	H	M	M	3	A

C139	37	(APRM CL5:2B-12-37)	APRM CHANNEL 5:2B-12-37	L	H	M	M	3	A
C139	37	(APRM CL5:2C-36-45)	APRM CHANNEL 5:2C-36-45	L	H	M	M	3	A
C139	37	(APRM CL5:3A-04-29)	APRM CHANNEL 5:3A-04-29	L	H	M	M	3	A
C139	37	(APRM CL5:3B-44-37)	APRM CHANNEL 5:3B-44-37	L	H	M	M	3	A
C139	37	(APRM CL5:3C-20-29)	APRM CHANNEL 5:3C-20-29	L	H	M	M	3	A
C139	37	(APRM CL5:3D-28-37)	APRM CHANNEL 5:3D-28-37	L	H	M	M	3	A
C139	37	(APRM CL5:4A-36-29)	APRM CHANNEL 5:4A-36-29	L	H	M	M	3	A
C139	37	(APRM CL5:4B-28-21)	APRM CHANNEL 5:4B-28-21	L	H	M	M	3	A
C139	37	(APRM CL5:4D-12-21)	APRM CHANNEL 5:4D-12-21	L	H	M	M	3	A
C139	37	(APRM CL5:5A-20-13)	APRM CHANNEL 5:5A-20-13	L	H	M	M	3	A
C139	37	(APRM CL5:5D-44-21)	APRM CHANNEL 5:5D-44-21	L	H	M	M	3	A
C139	37	(APRM CL5:6C-36-13)	APRM CHANNEL 5:6C-36-13	L	H	M	M	3	A
C139	37	(APRM CL5:6D-28-05)	APRM CHANNEL 5:6D-28-05	L	H	M	M	3	A
C139	37	(APRM CL5:BYPASS)	APRM CHANNEL 5:BYPASS	L	H	M	M	3	A
C139	37	(APRM CL5:DNSCL)	APRM CHANNEL 5:DNSCL	L	H	M	M	3	A
C139	37	(APRM CL5:HI-HI)	APRM CHANNEL 5:HI-HI	L	H	M	M	3	A
C139	37	(APRM CL5:HIGH)	APRM CHANNEL 5:HIGH	L	H	M	M	3	A
C139	37	(APRM CL6:1B-20-45)	APRM CHANNEL 6:1B-20-45	L	H	M	M	3	A
C139	37	(APRM CL6:2C-12-37)	APRM CHANNEL 6:2C-12-37	L	H	M	M	3	A
C139	37	(APRM CL6:2D-36-45)	APRM CHANNEL 6:2D-36-45	L	H	M	M	3	A
C139	37	(APRM CL6:3A-28-37)	APRM CHANNEL 6:3A-28-37	L	H	M	M	3	A
C139	37	(APRM CL6:3B-04-29)	APRM CHANNEL 6:3B-04-29	L	H	M	M	3	A
C139	37	(APRM CL6:3C-44-37)	APRM CHANNEL 6:3C-44-37	L	H	M	M	3	A
C139	37	(APRM CL6:3D-20-29)	APRM CHANNEL 6:3D-20-29	L	H	M	M	3	A
C139	37	(APRM CL6:4A-12-21)	APRM CHANNEL 6:4A-12-21	L	H	M	M	3	A
C139	37	(APRM CL6:4B-30-29)	APRM CHANNEL 6:4B-30-29	L	H	M	M	3	A
C139	37	(APRM CL6:4C-28-21)	APRM CHANNEL 6:4C-28-21	L	H	M	M	3	A
C139	37	(APRM CL6:5A-44-21)	APRM CHANNEL 6:5A-44-21	L	H	M	M	3	A
C139	37	(APRM CL6:5B-20-13)	APRM CHANNEL 6:5B-20-13	L	H	M	M	3	A
C139	37	(APRM CL6:6A-28-05)	APRM CHANNEL 6:6A-28-05	L	H	M	M	3	A
C139	37	(APRM CL6:6D-36-13)	APRM CHANNEL 6:6D-36-13	L	H	M	M	3	A
C139	37	(APRM CL6:BYPASS)	APRM CHANNEL 6:BYPASS	L	H	M	M	3	A
C139	37	(APRM CL6:DNSCL)	APRM CHANNEL 6:DNSCL	L	H	M	M	3	A
C139	37	(APRM CL6:HI-HI)	APRM CHANNEL 6:HI-HI	L	H	M	M	3	A
C139	37	(APRM CL6:HIGH)	APRM CHANNEL 6:HIGH	L	H	M	M	3	A
C139	37	(LPRM GRP1:1A-28-45)	LPRM GRP1:1A-28-45	L	H	M	M	3	A
C139	37	(LPRM GRP1:2A-12-29)	LPRM GRP1:2A-12-29	L	H	M	M	3	A
C139	37	(LPRM GRP1:2B-20-37)	LPRM GRP1:2B-20-37	L	H	M	M	3	A
C139	37	(LPRM GRP1:3A-44-29)	LPRM GRP1:3A-44-29	L	H	M	M	3	A
C139	37	(LPRM GRP1:3C-28-29)	LPRM GRP1:3C-28-29	L	H	M	M	3	A
C139	37	(LPRM GRP1:3D-36-37)	LPRM GRP1:3D-36-37	L	H	M	M	3	A
C139	37	(LPRM GRP1:4A-28-13)	LPRM GRP1:4A-28-13	L	H	M	M	3	A
C139	37	(LPRM GRP1:4C-12-13)	LPRM GRP1:4C-12-13	L	H	M	M	3	A
C139	37	(LPRM GRP1:4D-20-21)	LPRM GRP1:4D-20-21	L	H	M	M	3	A

C139	37	(LPRM GRP1:5B-36-21)	LPRM GRP1:5B-36-21	L	H	M	M	3	A
C139	37	(LPRM GRP1:COMP)	LPRM GRP1:COMP)	L	H	M	M	3	A
C139	37	(LPRM GRP1:UPS/INOP)	LPRM GRP1:UPS/INOP	L	H	M	L	3	A
C139	37	(LPRM GRP2:1C-20-45)	LPRM GRP2:1C-20-45	L	H	M	M	3	A
C139	37	(LPRM GRP2:2A-36-45)	LPRM GRP2:2A-36-45	L	H	M	M	3	A
C139	37	(LPRM GRP2:2D-12-37)	LPRM GRP2:2D-12-37	L	H	M	M	3	A
C139	37	(LPRM GRP2:3A-20-29)	LPRM GRP2:3A-20-29	L	H	M	M	3	A
C139	37	(LPRM GRP2:3B-28-37)	LPRM GRP2:3B-28-37	L	H	M	M	3	A
C139	37	(LPRM GRP2:3C-04-29)	LPRM GRP2:3C-04-29	L	H	M	M	3	A
C139	37	(LPRM GRP2:3D-44-37)	LPRM GRP2:3D-44-37	L	H	M	M	3	A
C139	37	(LPRM GRP2:4B-12-21)	LPRM GRP2:4B-12-21	L	H	M	M	3	A
C139	37	(LPRM GRP2:4C-36-29)	LPRM GRP2:4C-36-29	L	H	M	M	3	A
C139	37	(LPRM GRP2:4D-28-21)	LPRM GRP2:4D-28-21	L	H	M	M	3	A
C139	37	(LPRM GRP2:5B-44-21)	LPRM GRP2:5B-44-21	L	H	M	M	3	A
C139	37	(LPRM GRP2:5C-20-13)	LPRM GRP2:5C-20-13	L	H	M	M	3	A
C139	37	(LPRM GRP2:6A-36-13)	LPRM GRP2:6A-36-13	L	H	M	M	3	A
C139	37	(LPRM GRP2:6B-28-05)	LPRM GRP2:6B-28-05	L	H	M	M	3	A
C139	37	(LPRM GRP2:COMP)	LPRM GRP2:COMP	L	H	M	M	3	A
C139	37	(LPRM GRP2:UPS/INOP)	LPRM GRP2:UPS/INOP	L	H	M	M	3	A
C139	37	(RBM CL7:BYPASS)	RBM CHANNEL 7:BYPASS	L	H	M	M	3	A
C139	37	(RBM CL7:COMP)	RBM CHANNEL 7:COMP	L	H	M	M	3	A
C139	37	(RBM CL7:EDGE ROD S)	RBM CHANNEL 7:EDGE ROD S	L	H	M	M	3	A
C139	37	(RBM CL7:HIGH)	RBM CHANNEL 7:HIGH	L	H	M	M	3	A
C139	37	(RBM CL7:NO BALANCE)	RBM CHANNEL 7:NO BALANCE	L	H	M	M	3	A
C139	37	(RBM CL7:NO ROD SL)	RBM CHANNEL 7:NO ROD SL	L	H	M	M	3	A
C139	37	(RBM CL7:RBM DNSCL)	RBM CHANNEL 7:RBM DNSCL	L	H	M	M	3	A
C139	37	(RBM CL7:REF. DNSCL)	RBM CHANNEL 7:REF. DNSCL	L	H	M	M	3	A
C139	37	(RBM CL7:ROD OUT IN)	RBM CHANNEL 7:ROD OUT IN	L	H	M	M	3	A
C139	37	(RBM CL7:TRIP INH)	RBM CHANNEL 7:TRIP INH	L	H	M	M	3	A
C139	37	(RBM CL7:UPS/INOP)	RBM CHANNEL 7:UPS/INOP	L	H	M	M	3	A
C139	37	(RBM CL7:UPSCL/INOP)	RBM CHANNEL 7:UPSCL/INOP	L	H	M	M	3	A
C139	37	(RBM CL8:BYPASS)	RBM CHANNEL 8:BYPASS	L	H	M	M	3	A
C139	37	(RBM CL8:COMP)	RBM CHANNEL 8:COMP	L	H	M	M	3	A
C139	37	(RBM CL8:EDGE ROD S)	RBM CHANNEL 8:EDGE ROD S	L	H	M	M	3	A
C139	37	(RBM CL8:HIGH)	RBM CHANNEL 8:HIGH	L	H	M	M	3	A
C139	37	(RBM CL8:NO BALANCE)	RBM CHANNEL 8:NO BALANCE	L	H	M	M	3	A
C139	37	(RBM CL8:NO ROD SL)	RBM CHANNEL 8:NO ROD SL	L	H	M	M	3	A
C139	37	(RBM CL8:RBM DNSCL)	RBM CHANNEL 8:RBM DNSCL	L	H	M	M	3	A
C139	37	(RBM CL8:REF. DNSCL)	RBM CHANNEL 8:REF. DNSCL	L	H	M	M	3	A
C139	37	(RBM CL8:ROD OUT IN)	RBM CHANNEL 8:ROD OUT IN	L	H	M	M	3	A
C139	37	(RBM CL8:TRIP INH)	RBM CHANNEL 8:TRIP INH	L	H	M	M	3	A
C139	37	(RBM CL8:UPSCL/INOP)	RBM CHANNEL 8:UPSCL/INOP	L	H	M	M	3	A
C139	24A	(DLTN AIR LOW FLOW)	DILUTION AIR LOW FLOW	L	H	L	H	3	A
C139	24A	(OVERTEMP)	AIR HEATER OVERTEMP LIGHT	L	H	H	M	3	A

C139	24B	(DLTN AIR LOW FLOW)	DILUTION AIR LOW FLOW	L	H	L	H	3	A
C139	24B	(OVERTEMP)	AIR HEATER OVERTEMP LIGHT	L	H	H	M	3	A
C139	257	(RM 7860 (OPERATE))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	257	(RM 7860 (TRIP 1))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	257	(RM 7860 (TRIP 2))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	257	(RM 9021A (TRIP 1))	EFT BLDG VENT RAD STATUS LIGHT	L	H	H	L	3	A
C139	257	(RM 9021A (TRIP 2))	EFT BLDG VENT RAD STATUS LIGHT	L	H	H	L	3	A
C139	258	(RM 7860 (OPERATE))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	258	(RM 7860 (TRIP 1))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	258	(RM 7860 (TRIP 2))	DRYWELL CH A HI RANGE RAD LIGHT	L	H	H	L	3	A
C139	258	(RM 9021B (OPERATE))	EFT BLDG VENT RAD STATUS LIGHT	L	H	H	L	3	A
C139	258	(RM 9021B (TRIP 1))	EFT BLDG VENT RAD STATUS LIGHT	L	H	H	L	3	A
C139	258	(RM 9021B (TRIP 2))	EFT BLDG VENT RAD STATUS LIGHT	L	H	H	L	3	A
C139	259	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	L	H	M	M	3	A
C139	259	(HEATER ON)	CH A CONT ATM ANALYZER-HEATER ON	L	H	M	M	3	A
C139	259	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	L	H	M	M	3	A
C139	259	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	L	H	M	M	3	A
C139	259	(POWER ON)	CH A CTM ATM ANALZ-POWER ON	L	H	M	M	3	A
C139	259	(SAMPLE LINE HTG ON)	CAM ISOL VALVE CH A LIGHT	L	H	M	M	3	A
C139	260	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	L	H	M	M	3	A
C139	260	(HEATER ON)	CH A CONT ATM ANALYZER-HEATER ON	L	H	M	M	3	A
C139	260	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	L	H	M	M	3	A
C139	260	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	L	H	M	M	3	A
C139	260	(POWER ON)	CH A CTM ATM ANALZ-POWER ON	L	H	M	M	3	A
C139	260	(SAMPLE LINE HTG ON)	CAM ISOL VALVE CH A LIGHT	L	H	M	M	3	A
C139	263A	(SPR(14 LGTS-C263A))	SPARE LIGHTS	L	H	M	H	3	A
C139	263A	(V-D-9052A (GRN))	V-EAC-14A RETURN AIR	L	H	M	L	3	A
C139	263A	(V-D-9052A (RED))	V-EAC-14A RETURN AIR	L	H	M	L	3	A
C139	263A	(V-D-9094A (GRN))	V-ERF-11 TSC SUPPLY	L	H	M	L	3	A
C139	263A	(V-D-9094A (RED))	V-ERF-11 TSC SUPPLY	L	H	M	L	3	A
C139	263A	(V-D-9111A (GRN))	V-ERF-11 DISCH	L	H	M	M	3	A
C139	263A	(V-D-9111A (RED))	V-ERF-11 DISCH	L	H	M	M	3	A
C139	263A	(V-D-9175A (GRN))	V-ERF-14A CONTROL	L	H	M	L	3	A
C139	263A	(V-D-9175A (RED))	V-ERF-14A CONTROL	L	H	M	L	3	A
C139	263A	(V-D-9176A (GRN))	V-ERF-14A EXHAUST ISOL	L	H	M	H	3	A
C139	263A	(V-D-9176A (RED))	V-ERF-14A EXHAUST ISOL	L	H	M	H	3	A
C139	263A	(V-D-9215A (GRN))	3RD FLOOR EFT SUPPLY AIR	L	H	L	L	4	A
C139	263A	(V-D-9215A (RED))	3RD FLOOR EFT SUPPLY AIR	L	H	L	L	4	A
C139	263A	(V-D-9216A (GRN))	V-EAC-14A OUTSIDE AIR	L	H	M	L	3	A
C139	263A	(V-D-9216A (RED))	V-EAC-14A OUTSIDE AIR	L	H	M	L	3	A
C139	264B	(SPR(14 LGTS-C264B))	SPARE LIGHTS	L	H	M	H	3	A
C139	264B	(V-D-9052B (GRN))	V-EAC-14B RETURN AIR	L	H	M	L	3	A
C139	264B	(V-D-9052B (RED))	V-EAC-14B RETURN AIR	L	H	M	L	3	A
C139	264B	(V-D-9092B (GRN))	V-EAC-14B TSC SUPPLY	L	H	M	L	3	A

C139	264B	(V-D-9092B (RED))	V-EAC-14B TSC SUPPLY	L	H	M	L	3	A
C139	264B	(V-D-9093B (RED))	V-EAC-14B CONT ROOM SUPPLY	L	H	H	H	3	A
C139	264B	(V-D-9094B (GRN))	V-ERF-12 TSC SUPPLY	L	H	M	L	3	A
C139	264B	(V-D-9094B (RED))	V-ERF-12 TSC SUPPLY	L	H	M	L	3	A
C139	264B	(V-D-9111B (GRN))	V-ERF-12 DISCH	L	H	M	M	3	A
C139	264B	(V-D-9111B (RED))	V-ERF-12 DISCH	L	H	M	M	3	A
C139	264B	(V-D-9175B (GRN))	V-ERF-14B CONTROL	L	H	M	L	3	A
C139	264B	(V-D-9175B (GRN))	V-ERF-14B CONTROL	L	H	M	L	3	A
C139	264B	(V-D-9175B (RED))	V-ERF-14B CONTROL	L	H	M	L	3	A
C139	264B	(V-D-9176B (GRN))	V-ERF-14B EXHAUST AIR	L	H	M	H	3	A
C139	264B	(V-D-9176B (RED))	V-ERF-14B EXHAUST AIR	L	H	M	H	3	A
C139	264B	(V-D-9177B (GRN))	V-ERF-14B TSC RETURN	L	H	M	L	3	A
C139	264B	(V-D-9177B (RED))	V-ERF-14B TSC RETURN	L	H	M	L	3	A
C139	264B	(V-D-9178B (GRN))	V-ERF-14B CONT ROOM RETURN	L	H	H	H	3	A
C139	264B	(V-D-9178B (RED))	V-ERF-14B CONT ROOM RETURN	L	H	H	H	3	A
C139	264B	(V-D-9212B (GRN))	EFT BATT ROOM SUPPLY	L	H	L	M	3	A
C139	264B	(V-D-9212B (RED))	EFT BATT ROOM SUPPLY	L	H	L	M	3	A
C139	264B	(V-D-9212B (RED))	EFT BATT ROOM SUPPLY	L	H	L	M	3	A
C139	264B	(V-D-9214B (GRN))	3RD FLOOR EFT SUPPLY AIR	L	H	L	L	4	A
C139	264B	(V-D-9214B (RED))	3RD FLOOR EFT SUPPLY AIR	L	H	L	L	4	A
C139	264B	(V-D-9215B (GRN))	3RD FLOOR EFT RETURN AIR	L	H	L	L	4	A
C139	264B	(V-D-9215B (RED))	3RD FLOOR EFT RETURN AIR	L	H	L	L	4	A
C139	264B	(V-D-9216B (GRN))	V-EAC-14B OUTSIDE AIR	L	H	M	L	3	A
C139	264B	(V-D-9216B (RED))	V-EAC-14B OUTSIDE AIR	L	H	M	L	3	A
C139	13	(F5 CONT ISOL-CL 3)	FUSE ON VALVE CNTL CL 3	L	H	L	L	4	B
C139	13	(F5 CONT ISOL-CL1,2)	FUSE ON VALVE CNTL CL 1 AND CL 2	L	H	L	L	4	B
C139	13	1-DS1	DRIVE CONTROL CHANNEL 1:READY	L	H	L	L	4	B
C139	13	1-DS11	VALVE CONTROL CHANNEL 1:SQUIB MO	L	H	H	L	3	B
C139	13	1-DS12	VALVE CONTROL CHANNEL 1:SHEAR VL	L	H	H	L	3	B
C139	13	1-DS15	VALVE CONTROL CHANNEL 1:TIME DEL	L	H	L	L	4	B
C139	13	1-DS3	DRIVE CONTROL CHANNEL 1:IN-CORE	L	H	L	L	4	B
C139	13	1-DS4	DRIVE CONTROL CHANNEL 1:IN-SHIEL	L	H	L	H	3	B
C139	13	2-DS1	DRIVE CONTROL CHANNEL 2:READY	L	H	L	L	4	B
C139	13	2-DS21	VALVE CONTROL CHANNEL 2:SQUIB MO	L	H	H	L	3	B
C139	13	2-DS22	VALVE CONTROL CHANNEL 2:SHEAR VL	L	H	H	L	3	B
C139	13	2-DS25	VALVE CONTROL CHANNEL 2:TIME DEL	L	H	L	L	4	B
C139	13	2-DS3	DRIVE CONTROL CHANNEL 2:IN-CORE	L	H	L	L	4	B
C139	13	2-DS4	DRIVE CONTROL CHANNEL 2:IN-SHIEL	L	H	L	H	3	B
C139	13	3-DS1	DRIVE CONTROL CHANNEL 3:READY	L	H	L	L	4	B
C139	13	3-DS3	DRIVE CONTROL CHANNEL 3:IN-CORE	L	H	L	L	4	B
C139	13	3-DS4	DRIVE CONTROL CHANNEL 3:IN-SHIEL	L	H	L	H	3	B
C139	252A	(COMPRESSOR 11 LOAD)	COMPRESSOR 11 LOAD	H	H	M	L	1	C
C139	252A	(COMPRESSOR 12 LOAD)	COMPRESSOR 11 LOAD	H	H	M	L	1	C
C139	252A	(HCV 7583 (OPEN))	HCV 7583 STATUS	H	H	M	H	1	C

C139	252D	RI 7571A (HIGH)	RECOMBINER BLDG INSTRUMENT ROOM	L	H	M	L	3	C
C139	252D	RI 7571A (LOW)	RECOMBINER BLDG INSTRUMENT ROOM	L	H	M	L	3	C
C139	252D	RI 7571B (HIGH)	RECOMBINER BLDG PUMP ROOM	L	H	M	L	3	C
C139	252D	RI 7571B (LOW)	RECOMBINER BLDG PUMP ROOM	L	H	M	L	3	C
C139	252D	RI 7612 (HIGH)	STORAGE BUILDING	L	H	M	L	3	C
C139	252D	RI 7612 (LOW)	STORAGE BUILDING	L	H	M	L	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C139	A	Monticello does not intend to change these devices. A review has been made of the devices associated with the HED. This review revealed that corrections are not necessary. (See HED C133 for further discussion)					X		
C139	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X
C139	C	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C141	6.5.3.1(d)	INDICATOR LIGHT	Alerting to unfavorable status should be a function of the annunciator system, not status lights.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C141	25	8045A	LOW FLOW	L	H	H	M	3	A
C141	25	8045B	LOW FLOW	L	H	H	M	3	A
C141	25	8045C	LOW FLOW	L	H	H	M	3	A
C141	25	8045D	LOW FLOW	L	H	H	M	3	A
C141	25	8045E	HIGH FLOW	L	H	H	M	3	A
C141	25	8045F	HIGH FLOW	L	H	H	M	3	A
C141	25	8045G	HIGH FLOW	L	H	H	M	3	A
C141	25	8045H	HIGH FLOW	L	H	H	M	3	A
C141	259	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	L	H	M	M	3	B
C141	259	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	L	H	M	M	3	B
C141	259	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	L	H	M	M	3	B
C141	260	(COMMON ALARM)	CH A CONT ATM ANALYZER-ALARM	L	H	M	M	3	B
C141	260	(HIGH NITROGEN)	CH A CONT ATM ANALYZER-HI NITROG	L	H	M	M	3	B
C141	260	(HIGH OXYGEN)	CH A CONT ATM ANALYZER-HI O2	L	H	M	M	3	B
C141	20	(BLDG SDG-LO A)	BUILDING SIDING-TROUBLE-LOW AIR	L	H	M	H	3	C
C141	20	(CR EFT AI SM DR TR)	CONTROL RM EFT AI SMOKE DETECTOR	L	H	H	M	3	C
C141	20	(CR EFT SMOKE ALARM)	CONTROL RM EFT OAI SMOKE ALARM	L	H	H	M	3	C
C141	20	(DIESEL FIREPUMP TR)	DIESEL FIRE PUMP TROUBLE	L	H	H	H	3	C
C141	20	(HI D-P HEPA FLTR)	HIGH DP HEPA FILTER	L	H	L	L	4	C
C141	20	(HI D-P ROUGH FLTR)	HIGH DP ROUGHING FILTER	L	H	L	L	4	C
C141	20	(NO. 1 M TRANS-LO A)	NO. 1 MAIN TRANS-TROUBLE LOW AIR	L	H	M	H	3	C
C141	20	(NO. 1 R TRANS-LO A)	NO. 1R RESERV TR-TROUBLE LOW AIR	L	H	M	H	3	C
C141	20	(NO. 11 A TRAN-LO A)	NO. 11 A TRAN-TROUBLE LOW AIR	L	H	M	H	3	C

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C141	A	Monticello will add a new alarm system to this panel to solve this problem.	X						
C141	B	Monticello does not intend to change this device. This is a typical design for this type of device. All instruments cannot be located on the front panel. When a trip signal is generated by these devices, two things happens. (1) A trip signal is sent to a front panel alarm window that directs the operator to this panel. (2) A light is illuminated on the affected instrument to assist the operator in quickly identifying the unit that is tripped and what trip has been actuated. These lights are backed up by an instrument meter that indicates the actual signal being generated by the device.					X		
C141	C	Monticello will review this HED in the context of a general upgrade of the alarm system on panel C20.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C145	6.5.3.2(b)	INDICATOR LIGHT	Illuminated indicator should be at least 10% brighter than surrounding panel (50% brighter is preferred).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C145	5	DS1A	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	L	L	H	H	4	
C145	10	17-451A	POWER SUPPLY PROCESS MON	L	H	H	L	3	
C145	10	ENG/311 (AMB)		L	H				
C145	10	ENG/312 (AMB)		L	H				
C145	20	(V-FU-3A (OFF))	SAMPLE HOOD EXH FAN	L	H	L	L	4	
C145	20	(V-FU-3B (OFF))	SAMPLE HOOD EXH FAN	L	H	L	L	4	
C145	20	(V-MZ-1 (OFF))	SWITCH GEAR AREA FAN	L	H	L	L	4	
C145	20	(V-MZ-4 (OFF))	TURB BLDG SUPPLY FAN	L	H	L	L	4	
C145	20	(V-MZ-5 (OFF))	COND AREA SUPPLY AIR	L	H	L	L	4	
C145	20	(V-MZ-6 (OFF))	TURB BLDG SUPPLY AIR	L	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C145		Monticello will develop a standard for indicating lamps and establish that standard within the convention spec. All components will meet that performance standard.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C156	6.4.3.3(c)(4)	LEGEND STATUS LIGHT	Legend covers should be keyed to prevent interchanging covers.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C156	5	(ALARMS-RWM)	ALARMS-ROD WORTH MINIMIZER	L	L	L	H	4	
C156	5	(EAST DRAIN 3-33B)	EAST DRAIN 3-33B	L	L	H	M	4	
C156	5	(EAST DRAIN 3-33D)	EAST DRAIN 3-33D	L	L	H	M	4	
C156	5	(EAST VENT 3-32B)	EAST VENT 3-32B	L	L	H	M	4	
C156	5	(EAST VENT 3-32D)	EAST VENT 3-32D	L	L	H	M	4	
C156	5	(INTERLOCKS-RWM)	INTERLOCKS-ROD WORTH MINIMIZER	L	L	L	H	4	
C156	5	(WEST DRAIN 3-33A)	WEST DRAIN 3-33A	L	L	H	M	4	
C156	5	(WEST DRAIN 3-33C)	WEST DRAIN 3-33C	L	L	H	M	4	
C156	5	(WEST VENT 3-32A)	WEST VENT 3-32A	L	L	H	M	4	
C156	5	(WEST VENT 3-32C)	WEST VENT 3-32C	L	L	H	M	4	
C156	5	02-23	CR 02-27 INFO	L	L	H	H	4	
C156	5	02-27	CR 02-31 INFO	L	L	H	H	4	
C156	5	02-31	CR 02-35 INFO	L	L	H	H	4	
C156	5	04-29	LPRM 04-29 STRING	L	L	L	H	4	
C156	5	06-15	CR 06-19 INFO	L	L	H	H	4	
C156	5	06-19	CR 06-23 INFO	L	L	H	H	4	
C156	5	06-23	CR 06-23 INFO	L	L	H	H	4	
C156	5	06-27	CR 06-27 INFO	L	L	H	H	4	
C156	5	06-31	CR 06-31 INFO	L	L	H	H	4	
C156	5	06-35	CR 06-35 INFO	L	L	H	H	4	
C156	5	06-39	CR 06-39 INFO	L	L	H	H	4	
C156	5	10-11	CR 10-11 INFO	L	L	H	H	4	
C156	5	10-15	CR 10-15 INFO	L	L	H	H	4	
C156	5	10-19	CR 10-19 INFO	L	L	H	H	4	
C156	5	10-23	CR 10-23 INFO	L	L	H	H	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C156	5	10-27	CR 10-27 INFO	L	L	H	H	4	
C156	5	10-31	CR 10-31 INFO	L	L	H	H	4	
C156	5	10-35	CR 10-35 INFO	L	L	H	H	4	
C156	5	10-39	CR 10-39 INFO	L	L	H	H	4	
C156	5	10-43	CR 10-43 INFO	L	L	H	H	4	
C156	5	12-13	LPRM 12-13 STRING	L	L	L	H	4	
C156	5	12-21	LPRM 12-21 STRING	L	L	L	H	4	
C156	5	12-29	LPRM 12-29 STRING	L	L	L	H	4	
C156	5	12-37	LPRM 12-37 STRING	L	L	L	H	4	
C156	5	14-07	CR 14-07 INFO	L	L	H	H	4	
C156	5	14-11	CR 14-11 INFO	L	L	H	H	4	
C156	5	14-15	CR 14-15 INFO	L	L	H	H	4	
C156	5	14-19	CR 14-19 INFO	L	L	H	H	4	
C156	5	14-23	CR 14-23 INFO	L	L	H	H	4	
C156	5	14-27	CR 14-27 INFO	L	L	H	H	4	
C156	5	14-31	CR 14-31 INFO	L	L	H	H	4	
C156	5	14-35	CR 14-35 INFO	L	L	H	H	4	
C156	5	14-39	CR 14-39 INFO	L	L	H	H	4	
C156	5	14-43	CR 14-43 INFO	L	L	H	H	4	
C156	5	14-47	CR 14-47 INFO	L	L	H	H	4	
C156	5	18-07	CR 18-07 INFO	L	L	H	H	4	
C156	5	18-11	CR 18-11 INFO	L	L	H	H	4	
C156	5	18-15	CR 18-15 INFO	L	L	H	H	4	
C156	5	18-19	CR 18-19 INFO	L	L	H	H	4	
C156	5	18-23	CR 18-23 INFO	L	L	H	H	4	
C156	5	18-27	CR 18-27 INFO	L	L	H	H	4	
C156	5	18-31	CR 18-31 INFO	L	L	H	H	4	
C156	5	18-35	CR 18-35 INFO	L	L	H	H	4	
C156	5	18-39	CR 18-39 INFO	L	L	H	H	4	
C156	5	18-43	CR 18-43 INFO	L	L	H	H	4	
C156	5	18-47	CR 18-47 INFO	L	L	H	H	4	
C156	5	20-21	LPRM 20-21 STRING	L	L	L	H	4	
C156	5	20-37	LPRM 20-37 STRING	L	L	L	H	4	
C156	5	20-45	LPRM 20-45 STRING	L	L	L	H	4	
C156	5	22-03	CR 22-03 INFO	L	L	H	H	4	
C156	5	22-07	CR 22-07 INFO	L	L	H	H	4	
C156	5	22-11	CR 22-11 INFO	L	L	H	H	4	

C156 5	22-15	CR 22-15 INFO	L	L	H	H	4
C156 5	22-19	CR 22-19 INFO	L	L	H	H	4
C156 5	22-23	CR 22-23 INFO	L	L	H	H	4
C156 5	22-27	CR 22-27 INFO	L	L	H	H	4
C156 5	22-31	CR 22-31 INFO	L	L	H	H	4
C156 5	22-35	CR 22-35 INFO	L	L	H	H	4
C156 5	22-39	CR 22-39 INFO	L	L	H	H	4
C156 5	22-43	CR 22-43 INFO	L	L	H	H	4
C156 5	22-47	CR 22-47 INFO	L	L	H	H	4
C156 5	22-51	CR 22-51 INFO	L	L	H	H	4
C156 5	26-03	CR 26-03 INFO	L	L	H	H	4
C156 5	26-07	CR 26-07 INFO	L	L	H	H	4
C156 5	26-11	CR 26-11 INFO	L	L	H	H	4
C156 5	26-15	CR 26-15 INFO	L	L	H	H	4
C156 5	26-19	CR 26-19 INFO	L	L	H	H	4
C156 5	26-23	CR 26-23 INFO	L	L	H	H	4
C156 5	26-27	CR 26-27 INFO	L	L	H	H	4
C156 5	26-31	CR 26-31 INFO	L	L	H	H	4
C156 5	26-35	CR 26-35 INFO	L	L	H	H	4
C156 5	26-39	CR 26-39 INFO	L	L	H	H	4
C156 5	26-43	CR 26-43 INFO	L	L	H	H	4
C156 5	26-47	CR 26-47 INFO	L	L	H	H	4
C156 5	26-51	CR 26-51 INFO	L	L	H	H	4
C156 5	28-05	LPRM 28-05 STRING	L	L	L	H	4
C156 5	28-13	LPRM 28-13 STRING	L	L	L	H	4
C156 5	28-21	LPRM 28-21 STRING	L	L	L	H	4
C156 5	28-29	LPRM 28-29 STRING	L	L	L	H	4
C156 5	28-37	LPRM 28-37 STRING	L	L	L	H	4
C156 5	28-45	LPRM 28-45 STRING	L	L	L	H	4
C156 5	30-03	CR 30-03 INFO	L	L	H	H	4
C156 5	30-07	CR 30-07 INFO	L	L	H	H	4
C156 5	30-11	CR 30-11 INFO	L	L	H	H	4
C156 5	30-15	CR 30-15 INFO	L	L	H	H	4
C156 5	30-19	CR 30-19 INFO	L	L	H	H	4
C156 5	30-23	CR 30-23 INFO	L	L	H	H	4
C156 5	30-27	CR 30-27 INFO	L	L	H	H	4
C156 5	30-31	CR 30-31 INFO	L	L	H	H	4
C156 5	30-35	CR 30-35 INFO	L	L	H	H	4
C156 5	30-39	CR 30-39 INFO	L	L	H	H	4
C156 5	30-43	CR 30-43 INFO	L	L	H	H	4
C156 5	30-47	CR 30-47 INFO	L	L	H	H	4
C156 5	30-51	CR 30-51 INFO	L	L	H	H	4
C156 5	34-07	CR 34-07 INFO	L	L	H	H	4
C156 5	34-11	CR 34-11 INFO	L	L	H	H	4

C156 5	34-15	CR 34-15 INFO	L	L	H	H	4
C156 5	34-19	CR 34-19 INFO	L	L	H	H	4
C156 5	34-23	CR 34-23 INFO	L	L	H	H	4
C156 5	34-27	CR 34-27 INFO	L	L	H	H	4
C156 5	34-31	CR 34-31 INFO	L	L	H	H	4
C156 5	34-35	CR 34-35 INFO	L	L	H	H	4
C156 5	34-39	CR 34-39 INFO	L	L	H	H	4
C156 5	34-43	CR 34-43 INFO	L	L	H	H	4
C156 5	34-47	CR 34-47 INFO	L	L	H	H	4
C156 5	36-13	LPRM 36-13	L	L	L	H	4
C156 5	36-21	LPRM 36-21	L	L	L	H	4
C156 5	36-29	LPRM 36-29	L	L	L	H	4
C156 5	36-37	LPRM 36-37	L	L	L	H	4
C156 5	36-45	LPRM 36-45 STRING	L	L	L	H	4
C156 5	38-07	CR 38-07 INFO	L	L	H	H	4
C156 5	38-11	CR 38-11 INFO	L	L	H	H	4
C156 5	38-15	CR 38-15 INFO	L	L	H	H	4
C156 5	38-19	CR 38-19 INFO	L	L	H	H	4
C156 5	38-23	CR 38-23 INFO	L	L	H	H	4
C156 5	38-27	CR 38-27 INFO	L	L	H	H	4
C156 5	38-31	CR 38-31 INFO	L	L	H	H	4
C156 5	38-35	CR 38-35 INFO	L	L	H	H	4
C156 5	38-39	CR 38-39 INFO	L	L	H	H	4
C156 5	38-43	CR 38-43 INFO	L	L	H	H	4
C156 5	38-47	CR 38-47 INFO	L	L	H	H	4
C156 5	3A-DS13A	SELECTED CR POSITION	L	L	H	L	4
C156 5	3A-DS13B	SELECTED CR POSITION	L	L	H	L	4
C156 5	3A-DS13C	SELECTED CR POSITION	L	L	H	L	4
C156 5	3A-DS13D	SELECTED CR POSITION	L	L	H	L	4
C156 5	42-11	CR 42-11 INFO	L	L	H	H	4
C156 5	42-15	CR 42-15 INFO	L	L	H	H	4
C156 5	42-19	CR 42-19 INFO	L	L	H	H	4
C156 5	42-23	CR 42-23 INFO	L	L	H	H	4
C156 5	42-27	CR 42-27 INFO	L	L	H	H	4
C156 5	42-31	CR 42-31 INFO	L	L	H	H	4
C156 5	42-35	CR 42-35 INFO	L	L	H	H	4
C156 5	42-39	CR 42-39 INFO	L	L	H	H	4
C156 5	42-43	CR 42-43 INFO	L	L	H	H	4
C156 5	44-21	LPRM 44-21 STRING	L	L	L	H	4
C156 5	44-29	LPRM 44-29 STRING	L	L	L	H	4
C156 5	44-37	LPRM 44-37 STRING	L	L	L	H	4
C156 5	46-15	CR 46-15 INFO	L	L	H	H	4
C156 5	46-19	CR 46-19 INFO	L	L	H	H	4
C156 5	46-23	CR 46-23 INFO	L	L	H	H	4

C156 5	46-27	CR 46-27 INFO	L	L	H	H	4
C156 5	46-31	CR 46-31 INFO	L	L	H	H	4
C156 5	46-35	CR 46-35 INFO	L	L	H	H	4
C156 5	46-39	CR 46-39 INFO	L	L	H	H	4
C156 5	50-23	CR 50-23 INFO	L	L	H	H	4
C156 5	50-27	CR 50-27 INFO	L	L	H	H	4
C156 5	50-31	CR 50-31 INFO	L	L	H	H	4
C156 5	7A-DS1A	SRM CH 21	L	L	M	M	5
C156 5	7A-DS1B	SRM CH 23	L	L	M	M	5
C156 5	7A-DS1C	SRM CH 22	L	L	M	M	5
C156 5	7A-DS1D	SRM CH 24	L	L	M	M	5
C156 5	7A-DS2A	SRM CH 21	L	L	M	H	4
C156 5	7A-DS2B	SRM CH 23	L	L	M	H	4
C156 5	7A-DS2C	SRM CH 22	L	L	M	H	4
C156 5	7A-DS2D	SRM CH 24	L	L	M	H	4
C156 5	7A-DS3A	SRM 21 SHORT PERIOD INDICATION	L	L	M	M	5
C156 5	7A-DS3B	SRM 23 SHORT PERIOD INDICATION	L	L	M	M	5
C156 5	7A-DS3C	SRM 22 SHORT PERIOD INDICATION	L	L	M	M	5
C156 5	7A-DS3D	SRM 24 SHORT PERIOD INDICATION	L	L	M	M	5
C156 5	7A-DS4A	SRM 21 DET RETRACT PERMISSIVE	L	L	L	L	5
C156 5	7A-DS4B	SRM 23 DET RETRACT PERMISSIVE	L	L	L	L	5
C156 5	7A-DS4C	SRM 22 DET RETRACT PERMISSIVE	L	L	L	L	5
C156 5	7A-DS4D	SRM 24 DET RETRACT PERMISSIVE	L	L	L	L	5
C156 5	7A-DS5A	IRM CH 11	L	L	M	H	4
C156 5	7A-DS5B	IRM CH 15	L	L	M	H	4
C156 5	7A-DS5C	IRM CH 12	L	L	M	H	4
C156 5	7A-DS5D	IRM CH 16	L	L	M	H	4
C156 5	7A-DS5E	IRM CH 13	L	L	M	H	4
C156 5	7A-DS5F	IRM CH 17	L	L	M	H	4
C156 5	7A-DS5G	IRM CH 14	L	L	M	H	4
C156 5	7A-DS5H	IRM CH 18	L	L	M	H	4
C156 5	7A-DS6A	IRM CH 11	L	L	M	M	5
C156 5	7A-DS6B	IRM CH 15	L	L	M	M	5
C156 5	7A-DS6C	IRM CH 12	L	L	M	M	5
C156 5	7A-DS6D	IRM CH 16	L	L	M	M	5
C156 5	7A-DS6E	IRM CH 13	L	L	M	M	5
C156 5	7A-DS6F	IRM CH 17	L	L	M	M	5
C156 5	7A-DS6G	IRM CH 14	L	L	M	M	5
C156 5	7A-DS6H	IRM CH 18	L	L	M	M	5
C156 5	7B-DS1A	DETECTOR BYPASS	L	L	L	L	5
C156 5	7B-DS1B	DETECTOR BYPASS	L	L	L	L	5
C156 5	7B-DS1C	DETECTOR BYPASS	L	L	L	L	5
C156 5	7B-DS1D	DETECTOR BYPASS	L	L	L	L	5
C156 5	7B-DS2A	DETECTOR BYPASS	L	L	L	L	5

C156	5	7B-DS2B	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS2C	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS2D	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS3A	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS3B	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS3C	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS3D	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS4A	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS4B	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS4C	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS4D	DETECTOR BYPASS	L	L	L	L	5
C156	5	7B-DS5A	APRM CH 1	L	L	H	H	4
C156	5	7B-DS5B	APRM CH 4	L	L	H	H	4
C156	5	7B-DS5C	APRM CH 2	L	L	H	H	4
C156	5	7B-DS5D	APRM CH 5	L	L	H	H	4
C156	5	7B-DS5E	APRM CH 3	L	L	H	H	4
C156	5	7B-DS5F	APRM CH 6	L	L	H	H	4
C156	5	7B-DS6A	APRM CH 1	L	L	H	M	4
C156	5	7B-DS6B	APRM CH 4	L	L	H	M	4
C156	5	7B-DS6C	APRM CH 2	L	L	H	M	4
C156	5	7B-DS6D	APRM CH 5	L	L	H	M	4
C156	5	7B-DS6E	APRM CH 3	L	L	H	M	4
C156	5	7B-DS6F	APRM CH 6	L	L	H	M	4
C156	5	7B-DS7A	RBM CH 7	L	L	L	L	5
C156	5	7B-DS7B	RBM CH 8	L	L	L	L	5
C156	5	7B-DS8A	RBM CH 7	L	L	L	M	5
C156	5	7B-DS8B	RBM CH 8	L	L	L	M	5
C156	7	(TURBINE SEQ MNTR)		L	L	L	M	5
C156	7	M478-170	TURB. S/U / S/D SEQUENCE MONITOR	L	L	M	M	5

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C156		Monticello will develop a procedure to control bulb replacement in lighted legend covers.			X	X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C157	6.5.1.1(f)	LEGEND STATUS LIGHT	Failure of panel instruments should be apparent to the operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C157	5	(ALARMS-RWM)	ALARMS-ROD WORTH MINIMIZER	M	M	L	H	4	
C157	5	(INTERLOCKS-RWM)	INTERLOCKS-ROD WORTH MINIMIZER	M	M	L	H	4	
C157	5	02-23	CR 02-27 INFO	M	M	H	H	4	
C157	5	02-27	CR 02-31 INFO	M	M	H	H	4	
C157	5	02-31	CR 02-35 INFO	M	M	H	H	4	
C157	5	04-29	LPRM 04-29 STRING	M	M	L	H	4	
C157	5	06-15	CR 06-19 INFO	M	M	H	H	4	
C157	5	06-19	CR 06-23 INFO	M	M	H	H	4	
C157	5	06-23	CR 06-23 INFO	M	M	H	H	4	
C157	5	06-27	CR 06-27 INFO	M	M	H	H	4	
C157	5	06-31	CR 06-31 INFO	M	M	H	H	4	
C157	5	06-35	CR 06-35 INFO	M	M	H	H	4	
C157	5	06-39	CR 06-39 INFO	M	M	H	H	4	
C157	5	10-11	CR 10-11 INFO	M	M	H	H	4	
C157	5	10-15	CR 10-15 INFO	M	M	H	H	4	
C157	5	10-19	CR 10-19 INFO	M	M	H	H	4	
C157	5	10-23	CR 10-23 INFO	M	M	H	H	4	
C157	5	10-27	CR 10-27 INFO	M	M	H	H	4	
C157	5	10-31	CR 10-31 INFO	M	M	H	H	4	
C157	5	10-35	CR 10-35 INFO	M	M	H	H	4	
C157	5	10-39	CR 10-39 INFO	M	M	H	H	4	
C157	5	10-43	CR 10-43 INFO	M	M	H	H	4	
C157	5	12-13	LPRM 12-13 STRING	M	M	L	H	4	
C157	5	12-21	LPRM 12-21 STRING	M	M	L	H	4	
C157	5	12-29	LPRM 12-29 STRING	M	M	L	H	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C157	5	12-37	LPRM 12-37 STRING	M	M	L	H	4	
C157	5	14-07	CR 14-07 INFO	M	M	H	H	4	
C157	5	14-11	CR 14-11 INFO	M	M	H	H	4	
C157	5	14-15	CR 14-15 INFO	M	M	H	H	4	
C157	5	14-19	CR 14-19 INFO	M	M	H	H	4	
C157	5	14-23	CR 14-23 INFO	M	M	H	H	4	
C157	5	14-27	CR 14-27 INFO	M	M	H	H	4	
C157	5	14-31	CR 14-31 INFO	M	M	H	H	4	
C157	5	14-35	CR 14-35 INFO	M	M	H	H	4	
C157	5	14-39	CR 14-39 INFO	M	M	H	H	4	
C157	5	14-43	CR 14-43 INFO	M	M	H	H	4	
C157	5	14-47	CR 14-47 INFO	M	M	H	H	4	
C157	5	18-07	CR 18-07 INFO	M	M	H	H	4	
C157	5	18-11	CR 18-11 INFO	M	M	H	H	4	
C157	5	18-15	CR 18-15 INFO	M	M	H	H	4	
C157	5	18-19	CR 18-19 INFO	M	M	H	H	4	
C157	5	18-23	CR 18-23 INFO	M	M	H	H	4	
C157	5	18-27	CR 18-27 INFO	M	M	H	H	4	
C157	5	18-31	CR 18-31 INFO	M	M	H	H	4	
C157	5	18-35	CR 18-35 INFO	M	M	H	H	4	
C157	5	18-39	CR 18-39 INFO	M	M	H	H	4	
C157	5	18-43	CR 18-43 INFO	M	M	H	H	4	
C157	5	18-47	CR 18-47 INFO	M	M	H	H	4	
C157	5	20-13	LPRM 20-13 STRING	M	M	L	H	4	
C157	5	20-21	LPRM 20-21 STRING	M	M	L	H	4	
C157	5	20-29	LPRM 20-29 STRING	M	M	L	H	4	
C157	5	20-37	LPRM 20-37 STRING	M	M	L	H	4	
C157	5	20-45	LPRM 20-45 STRING	M	M	L	H	4	
C157	5	22-03	CR 22-03 INFO	M	M	H	H	4	
C157	5	22-07	CR 22-07 INFO	M	M	H	H	4	
C157	5	22-11	CR 22-11 INFO	M	M	H	H	4	
C157	5	22-15	CR 22-15 INFO	M	M	H	H	4	
C157	5	22-19	CR 22-19 INFO	M	M	H	H	4	
C157	5	22-23	CR 22-23 INFO	M	M	H	H	4	
C157	5	22-27	CR 22-27 INFO	M	M	H	H	4	
C157	5	22-31	CR 22-31 INFO	M	M	H	H	4	
C157	5	22-35	CR 22-35 INFO	M	M	H	H	4	

C157 5	22-39	CR 22-39 INFO	M	M	H	H	4
C157 5	22-43	CR 22-43 INFO	M	M	H	H	4
C157 5	22-47	CR 22-47 INFO	M	M	H	H	4
C157 5	22-51	CR 22-51 INFO	M	M	H	H	4
C157 5	26-03	CR 26-03 INFO	M	M	H	H	4
C157 5	26-07	CR 26-07 INFO	M	M	H	H	4
C157 5	26-11	CR 26-11 INFO	M	M	H	H	4
C157 5	26-15	CR 26-15 INFO	M	M	H	H	4
C157 5	26-19	CR 26-19 INFO	M	M	H	H	4
C157 5	26-23	CR 26-23 INFO	M	M	H	H	4
C157 5	26-27	CR 26-27 INFO	M	M	H	H	4
C157 5	26-31	CR 26-31 INFO	M	M	H	H	4
C157 5	26-35	CR 26-35 INFO	M	M	H	H	4
C157 5	26-39	CR 26-39 INFO	M	M	H	H	4
C157 5	26-43	CR 26-43 INFO	M	M	H	H	4
C157 5	26-47	CR 26-47 INFO	M	M	H	H	4
C157 5	26-51	CR 26-51 INFO	M	M	H	H	4
C157 5	28-05	LPRM 28-05 STRING	M	M	L	H	4
C157 5	28-13	LPRM 28-13 STRING	M	M	L	H	4
C157 5	28-21	LPRM 28-21 STRING	M	M	L	H	4
C157 5	28-29	LPRM 28-29 STRING	M	M	L	H	4
C157 5	28-37	LPRM 28-37 STRING	M	M	L	H	4
C157 5	28-45	LPRM 28-45 STRING	M	M	L	H	4
C157 5	30-03	CR 30-03 INFO	M	M	H	H	4
C157 5	30-07	CR 30-07 INFO	M	M	H	H	4
C157 5	30-11	CR 30-11 INFO	M	M	H	H	4
C157 5	30-19	CR 30-19 INFO	M	M	H	H	4
C157 5	30-23	CR 30-23 INFO	M	M	H	H	4
C157 5	30-27	CR 30-27 INFO	M	M	H	H	4
C157 5	30-31	CR 30-31 INFO	M	M	H	H	4
C157 5	30-35	CR 30-35 INFO	M	M	H	H	4
C157 5	30-39	CR 30-39 INFO	M	M	H	H	4
C157 5	30-43	CR 30-43 INFO	M	M	H	H	4
C157 5	30-47	CR 30-47 INFO	M	M	H	H	4
C157 5	30-51	CR 30-51 INFO	M	M	H	H	4
C157 5	34-07	CR 34-07 INFO	M	M	H	H	4
C157 5	34-11	CR 34-11 INFO	M	M	H	H	4
C157 5	34-15	CR 34-15 INFO	M	M	H	H	4
C157 5	34-19	CR 34-19 INFO	M	M	H	H	4
C157 5	34-23	CR 34-23 INFO	M	M	H	H	4
C157 5	34-27	CR 34-27 INFO	M	M	H	H	4
C157 5	34-31	CR 34-31 INFO	M	M	H	H	4
C157 5	34-35	CR 34-35 INFO	M	M	H	H	4
C157 5	34-39	CR 34-39 INFO	M	M	H	H	4

C157 5	34-43	CR 34-43 INFO	M	M	H	H	4
C157 5	34-47	CR 34-47 INFO	M	M	H	H	4
C157 5	36-13	LPRM 36-13	M	M	L	H	4
C157 5	36-21	LPRM 36-21	M	M	L	H	4
C157 5	36-29	LPRM 36-29	M	M	L	H	4
C157 5	36-37	LPRM 36-37	M	M	L	H	4
C157 5	36-45	LPRM 36-45 STRING	M	M	L	H	4
C157 5	38-07	CR 38-07 INFO	M	M	H	H	4
C157 5	38-11	CR 38-11 INFO	M	M	H	H	4
C157 5	38-15	CR 38-15 INFO	M	M	H	H	4
C157 5	38-19	CR 38-19 INFO	M	M	H	H	4
C157 5	38-23	CR 38-23 INFO	M	M	H	H	4
C157 5	38-27	CR 38-27 INFO	M	M	H	H	4
C157 5	38-31	CR 38-31 INFO	M	M	H	H	4
C157 5	38-35	CR 38-35 INFO	M	M	H	H	4
C157 5	38-39	CR 38-39 INFO	M	M	H	H	4
C157 5	38-43	CR 38-43 INFO	M	M	H	H	4
C157 5	38-47	CR 38-47 INFO	M	M	H	H	4
C157 5	3A-DS13A	SELECTED CR POSITION	M	M	H	L	4
C157 5	3A-DS13B	SELECTED CR POSITION	M	M	H	L	4
C157 5	3A-DS13C	SELECTED CR POSITION	M	M	H	L	4
C157 5	3A-DS13D	SELECTED CR POSITION	M	M	H	L	4
C157 5	42-11	CR 42-11 INFO	M	M	H	H	4
C157 5	42-15	CR 42-15 INFO	M	M	H	H	4
C157 5	42-19	CR 42-19 INFO	M	M	H	H	4
C157 5	42-23	CR 42-23 INFO	M	M	H	H	4
C157 5	42-31	CR 42-31 INFO	M	M	H	H	4
C157 5	42-35	CR 42-35 INFO	M	M	H	H	4
C157 5	42-39	CR 42-39 INFO	M	M	H	H	4
C157 5	42-43	CR 42-43 INFO	M	M	H	H	4
C157 5	44-21	LPRM 44-21 STRING	M	M	L	H	4
C157 5	44-29	LPRM 44-29 STRING	M	M	L	H	4
C157 5	44-37	LPRM 44-37 STRING	M	M	L	H	4
C157 5	46-15	CR 46-15 INFO	M	M	H	H	4
C157 5	46-19	CR 46-19 INFO	M	M	H	H	4
C157 5	46-23	CR 46-23 INFO	M	M	H	H	4
C157 5	46-27	CR 46-27 INFO	M	M	H	H	4
C157 5	46-31	CR 46-31 INFO	M	M	H	H	4
C157 5	46-35	CR 46-35 INFO	M	M	H	H	4
C157 5	46-39	CR 46-39 INFO	M	M	H	H	4
C157 5	50-23	CR 50-23 INFO	M	M	H	H	4
C157 5	50-27	CR 50-27 INFO	M	M	H	H	4
C157 5	50-31	CR 50-31 INFO	M	M	H	H	4
C157 5	7A-DS1A	SRM CH 21	M	M	M	M	4

C157 5	7A-DS1B	SRM CH 23	M	M	M	M	4
C157 5	7A-DS1C	SRM CH 22	M	M	M	M	4
C157 5	7A-DS1D	SRM CH 24	M	M	M	M	4
C157 5	7A-DS2A	SRM CH 21	M	M	M	H	4
C157 5	7A-DS2B	SRM CH 23	M	M	M	H	4
C157 5	7A-DS2C	SRM CH 22	M	M	M	H	4
C157 5	7A-DS2D	SRM CH 24	M	M	M	H	4
C157 5	7A-DS3A	SRM 21 SHORT PERIOD INDICATION	M	M	M	M	4
C157 5	7A-DS3B	SRM 23 SHORT PERIOD INDICATION	M	M	M	M	4
C157 5	7A-DS3C	SRM 22 SHORT PERIOD INDICATION	M	M	M	M	4
C157 5	7A-DS3D	SRM 24 SHORT PERIOD INDICATION	M	M	M	M	4
C157 5	7A-DS4A	SRM 21 DET RETRACT PERMISSIVE	M	M	L	L	4
C157 5	7A-DS4B	SRM 23 DET RETRACT PERMISSIVE	M	M	L	L	4
C157 5	7A-DS4C	SRM 22 DET RETRACT PERMISSIVE	M	M	L	L	4
C157 5	7A-DS4D	SRM 24 DET RETRACT PERMISSIVE	M	M	L	L	4
C157 5	7A-DS5A	IRM CH 11	M	M	M	H	4
C157 5	7A-DS5B	IRM CH 15	M	M	M	H	4
C157 5	7A-DS5C	IRM CH 12	M	M	M	H	4
C157 5	7A-DS5D	IRM CH 16	M	M	M	H	4
C157 5	7A-DS5E	IRM CH 13	M	M	M	H	4
C157 5	7A-DS5F	IRM CH 17	M	M	M	H	4
C157 5	7A-DS5G	IRM CH 14	M	M	M	H	4
C157 5	7A-DS5H	IRM CH 18	M	M	M	H	4
C157 5	7A-DS6A	IRM CH 11	M	M	M	M	4
C157 5	7A-DS6B	IRM CH 15	M	M	M	M	4
C157 5	7A-DS6C	IRM CH 12	M	M	M	M	4
C157 5	7A-DS6D	IRM CH 16	M	M	M	M	4
C157 5	7A-DS6E	IRM CH 13	M	M	M	M	4
C157 5	7A-DS6F	IRM CH 17	M	M	M	M	4
C157 5	7A-DS6G	IRM CH 14	M	M	M	M	4
C157 5	7A-DS6H	IRM CH 18	M	M	M	M	4
C157 5	7B-DS1A	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS1B	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS1C	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS1D	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS2A	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS2B	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS2C	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS2D	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS3A	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS3B	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS3C	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS3D	DETECTOR BYPASS	M	M	L	L	4
C157 5	7B-DS4A	DETECTOR BYPASS	M	M	L	L	4

C157	5	7B-DS4B	DETECTOR BYPASS	M	M	L	L	4
C157	5	7B-DS4C	DETECTOR BYPASS	M	M	L	L	4
C157	5	7B-DS4D	DETECTOR BYPASS	M	M	L	L	4
C157	5	7B-DS5A	APRM CH 1	M	M	H	H	4
C157	5	7B-DS5B	APRM CH 4	M	M	H	H	4
C157	5	7B-DS5C	APRM CH 2	M	M	H	H	4
C157	5	7B-DS5D	APRM CH 5	M	M	H	H	4
C157	5	7B-DS5E	APRM CH 3	M	M	H	H	4
C157	5	7B-DS5F	APRM CH 6	M	M	H	H	4
C157	5	7B-DS6A	APRM CH 1	M	M	H	M	4
C157	5	7B-DS6B	APRM CH 4	M	M	H	M	4
C157	5	7B-DS6C	APRM CH 2	M	M	H	M	4
C157	5	7B-DS6D	APRM CH 5	M	M	H	M	4
C157	5	7B-DS6E	APRM CH 3	M	M	H	M	4
C157	5	7B-DS6F	APRM CH 6	M	M	H	M	4
C157	5	7B-DS7A	RBM CH 7	M	M	L	L	4
C157	5	7B-DS7B	RBM CH 8	M	M	L	L	4
C157	5	7B-DS8A	RBM CH 7	M	M	L	M	4
C157	5	7B-DS8B	RBM CH 8	M	M	L	M	4
C157	7	(TURBINE SEQ MNTR)		M	M	L	M	4
C157	7	M478-170	TURB. S/U / S/D SEQUENCE MONITOR	M	M	M	M	4

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C157		Monticello does not intend to change these devices. A review has been made of the devices associated with the HED. This review revealed that corrections are not necessary. (See HED C133 for further discussion)					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C161	6.5.3.1(c)(1)	LEGEND STATUS LIGHT	System status should be inferred by illumination, not its absence.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C161	5	(ALARMS-RWM)	ALARMS-ROD WORTH MINIMIZER	L	M	L	H	4	
C161	5	(INTERLOCKS-RWM)	INTERLOCKS-ROD WORTH MINIMIZER	L	M	L	H	4	
C161	5	02-23	CR 02-27 INFO	L	M	H	H	4	
C161	5	02-27	CR 02-31 INFO	L	M	H	H	4	
C161	5	02-31	CR 02-35 INFO	L	M	H	H	4	
C161	5	04-29	LPRM 04-29 STRING	L	M	L	H	4	
C161	5	06-15	CR 06-19 INFO	L	M	H	H	4	
C161	5	06-19	CR 06-23 INFO	L	M	H	H	4	
C161	5	06-23	CR 06-23 INFO	L	M	H	H	4	
C161	5	06-27	CR 06-27 INFO	L	M	H	H	4	
C161	5	06-31	CR 06-31 INFO	L	M	H	H	4	
C161	5	06-35	CR 06-35 INFO	L	M	H	H	4	
C161	5	06-39	CR 06-39 INFO	L	M	H	H	4	
C161	5	10-11	CR 10-11 INFO	L	M	H	H	4	
C161	5	10-15	CR 10-15 INFO	L	M	H	H	4	
C161	5	10-19	CR 10-19 INFO	L	M	H	H	4	
C161	5	10-23	CR 10-23 INFO	L	M	H	H	4	
C161	5	10-27	CR 10-27 INFO	L	M	H	H	4	
C161	5	10-31	CR 10-31 INFO	L	M	H	H	4	
C161	5	10-35	CR 10-35 INFO	L	M	H	H	4	
C161	5	10-39	CR 10-39 INFO	L	M	H	H	4	
C161	5	10-43	CR 10-43 INFO	L	M	H	H	4	
C161	5	12-13	LPRM 12-13 STRING	L	M	L	H	4	
C161	5	12-21	LPRM 12-21 STRING	L	M	L	H	4	
C161	5	12-29	LPRM 12-29 STRING	L	M	L	H	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C161	5	12-37	LPRM 12-37 STRING	L	M	L	H	4	
C161	5	14-07	CR 14-07 INFO	L	M	H	H	4	
C161	5	14-11	CR 14-11 INFO	L	M	H	H	4	
C161	5	14-15	CR 14-15 INFO	L	M	H	H	4	
C161	5	14-19	CR 14-19 INFO	L	M	H	H	4	
C161	5	14-23	CR 14-23 INFO	L	M	H	H	4	
C161	5	14-27	CR 14-27 INFO	L	M	H	H	4	
C161	5	14-31	CR 14-31 INFO	L	M	H	H	4	
C161	5	14-35	CR 14-35 INFO	L	M	H	H	4	
C161	5	14-39	CR 14-39 INFO	L	M	H	H	4	
C161	5	14-43	CR 14-43 INFO	L	M	H	H	4	
C161	5	14-47	CR 14-47 INFO	L	M	H	H	4	
C161	5	18-07	CR 18-07 INFO	L	M	H	H	4	
C161	5	18-11	CR 18-11 INFO	L	M	H	H	4	
C161	5	18-15	CR 18-15 INFO	L	M	H	H	4	
C161	5	18-19	CR 18-19 INFO	L	M	H	H	4	
C161	5	18-23	CR 18-23 INFO	L	M	H	H	4	
C161	5	18-27	CR 18-27 INFO	L	M	H	H	4	
C161	5	18-31	CR 18-31 INFO	L	M	H	H	4	
C161	5	18-35	CR 18-35 INFO	L	M	H	H	4	
C161	5	18-39	CR 18-39 INFO	L	M	H	H	4	
C161	5	18-43	CR 18-43 INFO	L	M	H	H	4	
C161	5	18-47	CR 18-47 INFO	L	M	H	H	4	
C161	5	20-13	LPRM 20-13 STRING	L	M	L	H	4	
C161	5	20-21	LPRM 20-21 STRING	L	M	L	H	4	
C161	5	20-29	LPRM 20-29 STRING	L	M	L	H	4	
C161	5	20-37	LPRM 20-37 STRING	L	M	L	H	4	
C161	5	20-45	LPRM 20-45 STRING	L	M	L	H	4	
C161	5	22-03	CR 22-03 INFO	L	M	H	H	4	
C161	5	22-07	CR 22-07 INFO	L	M	H	H	4	
C161	5	22-11	CR 22-11 INFO	L	M	H	H	4	
C161	5	22-15	CR 22-15 INFO	L	M	H	H	4	
C161	5	22-19	CR 22-19 INFO	L	M	H	H	4	
C161	5	22-23	CR 22-23 INFO	L	M	H	H	4	
C161	5	22-27	CR 22-27 INFO	L	M	H	H	4	
C161	5	22-31	CR 22-31 INFO	L	M	H	H	4	
C161	5	22-35	CR 22-35 INFO	L	M	H	H	4	

C161	5	22-39	CR 22-39 INFO	L	M	H	H	4
C161	5	22-43	CR 22-43 INFO	L	M	H	H	4
C161	5	22-47	CR 22-47 INFO	L	M	H	H	4
C161	5	22-51	CR 22-51 INFO	L	M	H	H	4
C161	5	26-03	CR 26-03 INFO	L	M	H	H	4
C161	5	26-07	CR 26-07 INFO	L	M	H	H	4
C161	5	26-11	CR 26-11 INFO	L	M	H	H	4
C161	5	26-15	CR 26-15 INFO	L	M	H	H	4
C161	5	26-19	CR 26-19 INFO	L	M	H	H	4
C161	5	26-23	CR 26-23 INFO	L	M	H	H	4
C161	5	26-27	CR 26-27 INFO	L	M	H	H	4
C161	5	26-31	CR 26-31 INFO	L	M	H	H	4
C161	5	26-35	CR 26-35 INFO	L	M	H	H	4
C161	5	26-39	CR 26-39 INFO	L	M	H	H	4
C161	5	26-43	CR 26-43 INFO	L	M	H	H	4
C161	5	26-47	CR 26-47 INFO	L	M	H	H	4
C161	5	26-51	CR 26-51 INFO	L	M	H	H	4
C161	5	28-05	LPRM 28-05 STRING	L	M	L	H	4
C161	5	28-13	LPRM 28-13 STRING	L	M	L	H	4
C161	5	28-21	LPRM 28-21 STRING	L	M	L	H	4
C161	5	28-29	LPRM 28-29 STRING	L	M	L	H	4
C161	5	28-37	LPRM 28-37 STRING	L	M	L	H	4
C161	5	28-45	LPRM 28-45 STRING	L	M	L	H	4
C161	5	30-03	CR 30-03 INFO	L	M	H	H	4
C161	5	30-07	CR 30-07 INFO	L	M	H	H	4
C161	5	30-11	CR 30-11 INFO	L	M	H	H	4
C161	5	30-19	CR 30-19 INFO	L	M	H	H	4
C161	5	30-23	CR 30-23 INFO	L	M	H	H	4
C161	5	30-27	CR 30-27 INFO	L	M	H	H	4
C161	5	30-31	CR 30-31 INFO	L	M	H	H	4
C161	5	30-35	CR 30-35 INFO	L	M	H	H	4
C161	5	30-39	CR 30-39 INFO	L	M	H	H	4
C161	5	30-43	CR 30-43 INFO	L	M	H	H	4
C161	5	30-47	CR 30-47 INFO	L	M	H	H	4
C161	5	30-51	CR 30-51 INFO	L	M	H	H	4
C161	5	34-07	CR 34-07 INFO	L	M	H	H	4
C161	5	34-11	CR 34-11 INFO	L	M	H	H	4
C161	5	34-15	CR 34-15 INFO	L	M	H	H	4
C161	5	34-19	CR 34-19 INFO	L	M	H	H	4
C161	5	34-23	CR 34-23 INFO	L	M	H	H	4
C161	5	34-27	CR 34-27 INFO	L	M	H	H	4
C161	5	34-31	CR 34-31 INFO	L	M	H	H	4
C161	5	34-35	CR 34-35 INFO	L	M	H	H	4
C161	5	34-39	CR 34-39 INFO	L	M	H	H	4

C161	5	34-43	CR 34-43 INFO	L	M	H	H	4
C161	5	34-47	CR 34-47 INFO	L	M	H	H	4
C161	5	36-13	LPRM 36-13	L	M	L	H	4
C161	5	36-21	LPRM 36-21	L	M	L	H	4
C161	5	36-29	LPRM 36-29	L	M	L	H	4
C161	5	36-37	LPRM 36-37	L	M	L	H	4
C161	5	36-45	LPRM 36-45 STRING	L	M	L	H	4
C161	5	38-07	CR 38-07 INFO	L	M	H	H	4
C161	5	38-11	CR 38-11 INFO	L	M	H	H	4
C161	5	38-15	CR 38-15 INFO	L	M	H	H	4
C161	5	38-19	CR 38-19 INFO	L	M	H	H	4
C161	5	38-23	CR 38-23 INFO	L	M	H	H	4
C161	5	38-27	CR 38-27 INFO	L	M	H	H	4
C161	5	38-31	CR 38-31 INFO	L	M	H	H	4
C161	5	38-35	CR 38-35 INFO	L	M	H	H	4
C161	5	38-39	CR 38-39 INFO	L	M	H	H	4
C161	5	38-43	CR 38-43 INFO	L	M	H	H	4
C161	5	38-47	CR 38-47 INFO	L	M	H	H	4
C161	5	3A-DS13A	SELECTED CR POSITION	L	M	H	L	4
C161	5	3A-DS13B	SELECTED CR POSITION	L	M	H	L	4
C161	5	3A-DS13C	SELECTED CR POSITION	L	M	H	L	4
C161	5	3A-DS13D	SELECTED CR POSITION	L	M	H	L	4
C161	5	42-11	CR 42-11 INFO	L	M	H	H	4
C161	5	42-15	CR 42-15 INFO	L	M	H	H	4
C161	5	42-19	CR 42-19 INFO	L	M	H	H	4
C161	5	42-23	CR 42-23 INFO	L	M	H	H	4
C161	5	42-27	CR 42-27 INFO	L	M	H	H	4
C161	5	42-31	CR 42-31 INFO	L	M	H	H	4
C161	5	42-35	CR 42-35 INFO	L	M	H	H	4
C161	5	42-39	CR 42-39 INFO	L	M	H	H	4
C161	5	42-43	CR 42-43 INFO	L	M	H	H	4
C161	5	44-21	LPRM 44-21 STRING	L	M	L	H	4
C161	5	44-29	LPRM 44-29 STRING	L	M	L	H	4
C161	5	44-37	LPRM 44-37 STRING	L	M	L	H	4
C161	5	46-15	CR 46-15 INFO	L	M	H	H	4
C161	5	46-19	CR 46-19 INFO	L	M	H	H	4
C161	5	46-23	CR 46-23 INFO	L	M	H	H	4
C161	5	46-27	CR 46-27 INFO	L	M	H	H	4
C161	5	46-31	CR 46-31 INFO	L	M	H	H	4
C161	5	46-35	CR 46-35 INFO	L	M	H	H	4
C161	5	46-39	CR 46-39 INFO	L	M	H	H	4
C161	5	50-23	CR 50-23 INFO	L	M	H	H	4
C161	5	50-27	CR 50-27 INFO	L	M	H	H	4
C161	5	50-31	CR 50-31 INFO	L	M	H	H	4

C161 5	7A-DS1A	SRM CH 21	L	M	M	M	4
C161 5	7A-DS1B	SRM CH 23	L	M	M	M	4
C161 5	7A-DS1C	SRM CH 22	L	M	M	M	4
C161 5	7A-DS1D	SRM CH 24	L	M	M	M	4
C161 5	7A-DS2A	SRM CH 21	L	M	M	H	4
C161 5	7A-DS2B	SRM CH 23	L	M	M	H	4
C161 5	7A-DS2C	SRM CH 22	L	M	M	H	4
C161 5	7A-DS2D	SRM CH 24	L	M	M	H	4
C161 5	7A-DS3A	SRM 21 SHORT PERIOD INDICATION	L	M	M	M	4
C161 5	7A-DS3B	SRM 23 SHORT PERIOD INDICATION	L	M	M	M	4
C161 5	7A-DS3C	SRM 22 SHORT PERIOD INDICATION	L	M	M	M	4
C161 5	7A-DS3D	SRM 24 SHORT PERIOD INDICATION	L	M	M	M	4
C161 5	7A-DS4A	SRM 21 DET RETRACT PERMISSIVE	L	M	L	L	4
C161 5	7A-DS4B	SRM 23 DET RETRACT PERMISSIVE	L	M	L	L	4
C161 5	7A-DS4C	SRM 22 DET RETRACT PERMISSIVE	L	M	L	L	4
C161 5	7A-DS4D	SRM 24 DET RETRACT PERMISSIVE	L	M	L	L	4
C161 5	7A-DS5A	IRM CH 11	L	M	M	H	4
C161 5	7A-DS5B	IRM CH 15	L	M	M	H	4
C161 5	7A-DS5C	IRM CH 12	L	M	M	H	4
C161 5	7A-DS5D	IRM CH 16	L	M	M	H	4
C161 5	7A-DS5E	IRM CH 13	L	M	M	H	4
C161 5	7A-DS5F	IRM CH 17	L	M	M	H	4
C161 5	7A-DS5G	IRM CH 14	L	M	M	H	4
C161 5	7A-DS5H	IRM CH 18	L	M	M	H	4
C161 5	7A-DS6A	IRM CH 11	L	M	M	M	4
C161 5	7A-DS6B	IRM CH 15	L	M	M	M	4
C161 5	7A-DS6C	IRM CH 12	L	M	M	M	4
C161 5	7A-DS6D	IRM CH 16	L	M	M	M	4
C161 5	7A-DS6E	IRM CH 13	L	M	M	M	4
C161 5	7A-DS6F	IRM CH 17	L	M	M	M	4
C161 5	7A-DS6G	IRM CH 14	L	M	M	M	4
C161 5	7A-DS6H	IRM CH 18	L	M	M	M	4
C161 5	7B-DS1A	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS1B	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS1C	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS1D	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS2A	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS2B	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS2C	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS2D	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS3A	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS3B	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS3C	DETECTOR BYPASS	L	M	L	L	4
C161 5	7B-DS3D	DETECTOR BYPASS	L	M	L	L	4

C161	5	7B-DS4A	DETECTOR BYPASS	L	M	L	L	4
C161	5	7B-DS4B	DETECTOR BYPASS	L	M	L	L	4
C161	5	7B-DS4C	DETECTOR BYPASS	L	M	L	L	4
C161	5	7B-DS4D	DETECTOR BYPASS	L	M	L	L	4
C161	5	7B-DS5A	APRM CH 1	L	M	H	H	4
C161	5	7B-DS5B	APRM CH 4	L	M	H	H	4
C161	5	7B-DS5C	APRM CH 2	L	M	H	H	4
C161	5	7B-DS5D	APRM CH 5	L	M	H	H	4
C161	5	7B-DS5E	APRM CH 3	L	M	H	H	4
C161	5	7B-DS5F	APRM CH 6	L	M	H	H	4
C161	5	7B-DS6A	APRM CH 1	L	M	H	M	4
C161	5	7B-DS6B	APRM CH 4	L	M	H	M	4
C161	5	7B-DS6C	APRM CH 2	L	M	H	M	4
C161	5	7B-DS6D	APRM CH 5	L	M	H	M	4
C161	5	7B-DS6E	APRM CH 3	L	M	H	M	4
C161	5	7B-DS6F	APRM CH 6	L	M	H	M	4
C161	5	7B-DS7A	RBM CH 7	L	M	L	L	4
C161	5	7B-DS7B	RBM CH 8	L	M	L	L	4
C161	5	7B-DS8A	RBM CH 7	L	M	L	M	4
C161	5	7B-DS8B	RBM CH 8	L	M	L	M	4
C161	7	(TURBINE SEQ MNTR)		L	M	L	M	4
C161	7	M478-170	TURB. S/U / S/D SEQUENCE MONITOR	L	M	M	M	4

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C161		Monticello does not plan to add to or change these components. Monticello feels that malfunctions with these indicators will be apparent with their disagreement with associated indicators. They are also on the RPIS and NIS systems, which are safety related and should not be modified in any way which would threaten the operation of the NIS or RPIS systems.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C166	6.5.1.1(f)	METER	Failure of panel instruments should be apparent to the operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C166	4	SI 2-184-16A	RECIRC PUMP A SPEED CONTROL	M	H	L	H	2	A
C166	4	SI 2-184-16B	RECIRC PUMP B SPEED CONTROL	M	H	L	H	2	A
C166	5	LI 2-3-85A	RPS LEVEL	M	H	H	L	2	A
C166	5	LI 2-3-85B	RPS LEVEL	M	H	H	L	2	A
C166	20	TI 1711	FEEDWATER & CONDENSATE	M	H	L	L	4	B
C166	10	17-151	OFF GAS RAD LEVEL	M	H	M	L	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C166	A	These components go below the "zero" mark when they fail. Operators are trained in the methods of recognizing failed instruments. In addition, Monticello intends to color code acceptable and unacceptable operating zones on control room instrumentation on a case-by-case basis. This concern will be considered along with other concerns when these instruments are evaluated for color coding.							X
C166	B	Monticello will not change this component, though the meter does not fail below "zero." When the operator uses it, he selects points from an array of buttons. If the meter malfunctions, then the meter will show a steady value for all selected points, and this will be clearly apparent to the					X		

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C166	C	This component does not fail below "zero," but Monticello does not plan to change it. Operators can now compare it to a recorder value or a redundant meter.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C167	6.5.1.2(b)	METER	All display values must be in immediately useable form, not requiring mental conversion.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C167	24A	POI 2942	VALVE CV-2942 POSITION	M	H	M	L	3	A
C167	24A	POI 2943	VALVE CV-2943 POSITION	M	H	H	M	2	A
C167	252D	RI 7613	COMP BLDG VENT DUCT RADIATION	M	H	M	L	3	B
C167	252D	RI 7684	REC BLDG VENT DUCT RADIATION	M	H	M	L	3	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C167	A	Monticello will remove the dymo label from this component, the conversion is only for the use of the chemist, who can carry a conversion chart as a reminder if necessary.	X						
C167	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C178	6.5.1.5(e)	METER	Logarithmic scales should be avoided except for very large ranges of values.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C178	3	FI 10-132A	SERVICE WATER FLOW A	M	M	H	M	4	A
C178	3	FI 10-132B	SERVICE WATER FLOW B	M	M	H	M	4	A
C178	3	FI 10-136A	CONTROL SPRAY FLOW A	M	M	H	L	4	A
C178	3	FI 10-136B	CONTROL SPRAY FLOW B	M	M	H	L	4	A
C178	3	FI 10-139A	RHR FLOW A	M	M	H	M	4	A
C178	3	FI 10-139B	RHR FLOW B	M	M	H	M	4	A
C178	3	FI 14-50A	PUMP SYSTEM I	M	M	H	M	4	A
C178	3	FI 14-50B	PUMP SYSTEM II	M	M	H	M	4	A
C178	4	AM 2-2-MBB	GEN DRIVE MOTOR B	M	M	L	M	4	A
C178	4	AM 2A-MBA	GEN DRIVE MOTOR A	M	M	L	M	4	A
C178	4	FI 12-141A	FILTER FLOW A	M	M	L	L	4	A
C178	4	FI 12-141B	FILTER FLOW B	M	M	L	L	4	A
C178	5	7-44A	SOURCE RANGE MON PERIOD CH 21	M	L	L	H	4	A
C178	5	7-44B	SOURCE RANGE MON PERIOD CH 23	M	L	L	H	4	A
C178	5	7-44C	SOURCE RANGE MON PERIOD CH 22	M	L	L	H	4	A
C178	5	7-44D	SOURCE RANGE MON PERIOD CH 24	M	L	L	H	4	A
C178	8	(109 LD CENTER AMPS)		M	M	M	L	4	A
C178	8	0A-A1	NO. 1 MAIN GENERATOR 0 A AMPERES	M	M	L	H	4	A
C178	8	0B-A1	NO. 1 MAIN GENERATOR 0 B AMPERES	M	M	L	H	4	A
C178	8	0C-A1	NO. 1 MAIN GENERATOR 0 C AMPERES	M	M	L	H	4	A
C178	8	A/DG1	NO.11 DIESEL GEN	M	M	H	L	4	A
C178	8	A/DG2	NO.12 DIESEL GEN	M	M	H	L	4	A
C178	8	A1-1	NO. 1R RES XFMR TO NO. 13 BUS	M	M	H	M	4	A
C178	8	A1-2	NO. 1R RES XFMR TO NO.11 BUS	M	M	H	M	4	A
C178	8	A1-3	NO. 1R RES XFMR TO NO. 12 BUS	M	M	H	M	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C178	8	A1-4	NO. 1R RES XFMR TO NO. 14 BUS	M	M	H	M	4	A
C178	8	A2-1	NO.11 XFMR TO NO.13 BUS	M	M	H	M	4	A
C178	8	A2-10	104 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-11	102 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-12	106 & 108 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-13	1AR XFMR	M	M	H	M	4	A
C178	8	A2-2	105 & 107 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-3	101 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-4	103 LOAD CENTER	M	M	H	M	4	A
C178	8	A2-5	NO.11 XFMR TO NO.11 BUS	M	M	H	M	4	A
C178	8	A2-7	NO. 11 XFMR TO NO. 12 BUS	M	M	H	M	4	A
C178	8	A2-9	NO.11 XFMR TO NO. 14 BUS	M	M	H	M	4	A
C178	8	CI 2355	STATOR LIQUID CONDUCTIVITY	M	M	L	H	4	A
C178	8	PI 1516	H2 PURITY	M	M	L	H	4	A
C178	8	V-10	1AR XFMR	M	M	M	M	4	A
C178	8	V-2	13 BUS	M	M	M	M	4	A
C178	8	V-3	11 BUS	M	M	M	M	4	A
C178	8	V-4	15 BUS	M	M	M	M	4	A
C178	8	V-6	12 BUS	M	M	M	M	4	A
C178	8	V-7	16 BUS	M	M	M	M	4	A
C178	8	V-9	14 BUS	M	M	M	M	4	A
C178	8	V/DG1	NO.11 DIESEL GEN	M	M	H	M	4	A
C178	8	V/DG2	NO.12 DIESEL GEN	M	M	H	M	4	A
C178	8	V/IN	SYNCHRONIZING INCOMING VOLTAGE	M	M	M	M	4	A
C178	8	V/RUN	SYNCHRONIZING RUNNING VOLTAGE	M	M	M	M	4	A
C178	2	IC1	MPCA MONITOR A DISCHARGE CANAL	M	L	H	H	4	A
C178	2	IC2	MPCA MONITOR B STACK GAS	M	L	H	H	4	A
C178	2	IC3	MPCA MONITOR RADWASTE	M	L	M	L	5	A
C178	10	17-150A	OFF GAS CH 1	M	M	H	H	4	A
C178	10	17-150B	OFF GAS CH 2	M	M	H	H	4	A
C178	10	17-251A	MAIN STEAM LINE CHANNEL A	M	M	H	H	4	A
C178	10	17-251B	MAIN STEAM LINE CHANNEL B	M	M	H	H	4	A
C178	10	17-251C	MAIN STEAM LINE CHANNEL C	M	M	H	H	4	A
C178	10	17-251D	MAIN STEAM LINE CHANNEL D	M	M	H	H	4	A
C178	10	17-350	RADWASTE EFFLUENT	M	M	M	L	4	A
C178	10	17-351	SERVICE WATER EFFLUENT	M	M	H	H	4	A
C178	10	17-352	CLOSED COOLING WATER EFFLUENT	M	M	M	M	4	A

C178 10	17-357A	DISCHARGE CANAL MONITOR A	M	M	H	H	4	A
C178 10	17-357B	DISCHARGE CANAL MONITOR B	M	M	H	H	4	A
C178 10	17-452A	REACTOR BLDG EXH PLENUM CH 1	M	M	H	H	4	A
C178 10	17-452B	REACTOR BLDG EXH PLENUM CH 2	M	M	H	H	4	A
C178 10	17-453A	SPENT FUEL POOL CHANNEL A	M	M	H	H	4	A
C178 10	17-453B	SPENT FUEL CHANNEL B	M	M	H	H	4	A
C178 10	17-454	CONTROL ROOM AIR INTAKE	M	M	H	M	4	A
C178 10	RM 7992A	TURB BLDG NORMAL WASTE SUMP	M	M	H	M	4	A
C178 10	RM 7992B	TURB BLDG NORMAL WASTE SUMP	M	M	H	M	4	A
C178 11	18-50	CONTROL ROOM LOW RANGE AREA MON	M	M	H	L	4	A
C178 11	18-51A	REFUEL FLOOR LOW RANGE AREA MON	M	M	H	L	4	A
C178 11	18-51B	REFUEL FLOOR STAIRWAY AREA MON	M	M	H	L	4	A
C178 11	18-51C	NEW FUEL STORAGE VAULT AREA MON	M	M	H	L	4	A
C178 11	18-51D	CONTAMINATED EQUIPMENT AREA MON	M	M	H	L	4	A
C178 11	18-51E	CONTAMINATED STORAGE AREA MON	M	M	H	L	4	A
C178 11	18-51F	RADWASTE ACCESS AREA MON	M	M	H	L	4	A
C178 11	18-51G	CLEAN UP SYSTEM AREA ACCESS MON	M	M	H	L	4	A
C178 11	18-51H	CONTROL ROD DR REPAIR AREA MON	M	M	H	L	4	A
C178 11	18-51I	EAST CRD MODULE AREA MON	M	M	H	L	4	A
C178 11	18-51J	WEST CRD MODULE AREA MON	M	M	H	L	4	A
C178 11	18-51K	TIP DRIVE AREA MON	M	M	H	L	4	A
C178 11	18-51L	HPCI TURBINE AREA MON	M	M	H	L	4	A
C178 11	18-51M	CONTROL ROD DRIVE PUMP AREA MON	M	M	H	L	4	A
C178 11	18-51N	RCIC EQUIPMENT AREA MON	M	M	H	L	4	A
C178 11	18-51P	EAST CORE SPRAY & RHR AREA MON	M	M	H	L	4	A
C178 11	18-51Q	WEST CORE SPRAY & RHR AREA MON	M	M	H	L	4	A
C178 11	18-51R	CONTROL LAB AREA MONITOR	M	M	H	L	4	A
C178 11	18-51S	TG FRONT STANDARD AREA MONITOR	M	M	H	L	4	A
C178 11	18-51T	CONDENSATE DEMIN OPERATING AREA	M	M	H	L	4	A
C178 11	18-51U	CONDENSATE SYSTEM AREA MON	M	M	H	L	4	A
C178 11	18-51V	FEEDWATER PUMP AREA MON	M	M	H	L	4	A
C178 11	18-51W	RADWASTE CONTROL ROOM AREA MON	M	M	H	L	4	A
C178 11	18-51X	SAMPLE TANK AREA MON	M	M	H	L	4	A
C178 11	18-51Y	CONVEYOR OPERATING AREA MON	M	M	H	L	4	A
C178 11	18-51Z	MACHINE SHOP AREA MON	M	M	H	L	4	A
C178 11	18-52	REFUEL FLOOR HIGH RANGE AREA MON	M	M	H	L	4	A
C178 11	18-57A	TIP CUBICLE	M	M	H	L	4	A
C178 11	18-57B	CONTROL ROOM HIGH RANGE	M	M	H	L	4	A
C178 11	18-57C	OPERATING FLOOR	M	M	H	L	4	A
C178 252C	FI 7680	CONDENSER E-601A WATER GPM	M	M	M	L	4	B

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C178	A	The Monticello operator training program provides adequate training in the reading of non-linear meter scales. If necessary these meter scales will be enhanced with additional scale markings. No other corrective actions are planned.	X						
C178	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C179	6.5.1.5(f)	METER	Multiscale indicators should be avoided. In some cases, there may confusion because of the lack of pointers matched to scales.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C179	3	LI 2-3-91A	REACTOR LEVEL A	M	M	H	H	4	A
C179	3	LI 2-3-91B	REACTOR LEVEL B	M	M	H	H	4	A
C179	5	LI 2-3-85A	RPS LEVEL	M	M	H	L	4	A
C179	5	LI 2-3-85B	RPS LEVEL	M	M	H	L	4	A
C179	36	(CH 11 IRM)	CH 11 IRM METER	M	M	H	H	4	B
C179	36	(CH 12 IRM)	CH 12 IRM METER	M	M	H	H	4	B
C179	36	(CH 13 IRM)	CH 13 IRM METER	M	M	H	H	4	B
C179	36	(CH 14 IRM)	CH 14 IRM METER	M	M	H	H	4	B
C179	36	(CH 15 IRM)	CH 15 IRM METER	M	M	H	H	4	B
C179	36	(CH 16 IRM)	CH 16 IRM METER	M	M	H	H	4	B
C179	36	(CH 17 IRM)	CH 17 IRM METER	M	M	H	H	4	B
C179	36	(CH 18 IRM)	CH 18 IRM METER	M	M	H	H	4	B
C179	10	17-151	OFF GAS RAD LEVEL	M	L	M	L	5	C
C179	10	RM 7992A	TURB BLDG NORMAL WASTE SUMP	M	L	H	M	4	C
C179	10	RM 7992B	TURB BLDG NORMAL WASTE SUMP	M	L	H	M	4	C
C179	37	(APRM CL1:METER)	APRM CHANNEL 1:METER	M	M	M	M	4	C
C179	37	(APRM CL2:METER)	APRM CHANNEL 2:METER	M	M	M	M	4	C
C179	37	(APRM CL3:METER)	APRM CHANNEL 3:METER	M	M	M	M	4	C
C179	37	(APRM CL4:METER)	APRM CHANNEL 4:METER	M	M	M	M	4	C
C179	37	(APRM CL5:METER)	APRM CHANNEL 5:METER	M	M	M	M	4	C
C179	37	(APRM CL6:METER)	APRM CHANNEL 6:METER	M	M	M	M	4	C
C179	37	(LPRM G1:METER)	LPRM G1:METER)	M	M	M	M	4	C
C179	37	(LPRM G2:METER)	LPRM G2:METER)	M	M	M	M	4	C

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C179	37	(RBM CL7:METER)	RBM CHANNEL 7:METER	M	M	M	M	4	C
C179	37	(RBM CL8:METER)	RBM CHANNEL 8:METER	M	M	M	M	4	C
C179	4	LI 2996	SUPPR CHAMBER LEVEL	M	M	H	M	4	D
C179	3	PI 23-116	PUMP INLET	M	M	H	L	4	E
C179	4	PI 13-96	PUMP SUCTION	M	M	H	L	4	E
C179	7	PI 1217	10-STAGE EXTR STM PRESSURE	M	M	M	L	4	E
C179	7	PI 1223	10-STAGE EXTR STM PRESSURE	M	M	M	L	4	E
C179	259	(AI-4018A (H2))	CH A % HYDROGEN METER	M	M	M	M	4	F
C179	259	(AI-4018A (O2))	CH A % OXYGEN METER	M	M	M	M	4	F
C179	260	(AI-4018B (H2))	CH B % HYDROGEN METER	M	M	M	M	4	F
C179	260	(AI-4018B (O2))	CH B % OXYGEN METER	M	M	M	M	4	F
C179	252D	FI 7476A	OFFGAS FLOW SCFM	M	M	L	L	4	G
C179	252D	FI 7476B	OFFGAS FLOW SCFM	M	M	L	L	4	G
C179	252D	FI 7477A	OFFGAS FLOW SCFM	M	M	L	L	4	G
C179	252D	FI 7477B	OFFGAS FLOW SCFM	M	M	L	L	4	G
C179	13	M1	FLUX AMPLIFIER METER	M	M	L	L	4	H

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C179	A	These components have been replaced since the checklist was completed and they have been subsequently reviewed.							
C179	B	Monticello will remove the second set of graduations on the IRM meters and recorders and off-gas flow indicators.	X						
C179	C	Monticello does not plan to change these components, because the multiscale indicators support test and calibration procedures and do not interfere with operations.					X		

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C179	D	Monticello plans no correction, because the component has associated indicating lights which identify the proper meter scale.					X		
C179	E	These devices will not be changed because of the large range the instruments have to cover.					X		
C179	F	These are dual range instruments, (High/Low). Monticello does not plan to change these scales.					X		
C179	G	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
C179	H	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panel C13.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C182	6.5.2.2(b)(2)	METER	Scale pointers should be mounted to avoid parallax errors.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA.	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C182	2	IC1	MPCA MONITOR A DISCHARGE CANAL	L	L	H	H	4	A
C182	2	IC2	MPCA MONITOR B STACK GAS	L	L	H	H	4	A
C182	2	IC3	MPCA MONITOR RADWASTE	L	L	M	L	5	A
C182	24A	POI 2943	VALVE CV-2943 POSITION	L	L	H	M	4	A
C182	24B	POI 2942	VALVE CV-2942 POSITION	L	L	H	M	4	A
C182	3	LI 2-3-91A	REACTOR LEVEL A	L	L	H	H	4	B
C182	3	LI 2-3-91B	REACTOR LEVEL B	L	L	H	H	4	B
C182	4	LI 2996	SUPPR CHAMBER LEVEL	L	L	H	M	4	B
C182	5	LI 2-3-85A	RPS LEVEL	L	L	H	L	4	B
C182	5	LI 2-3-85B	RPS LEVEL	L	L	H	L	4	B
C182	10	17-451A	POWER SUPPLY PROCESS MON	L	L	H	L	4	C
C182	10	17-451B	POWER SUPPLY PROCESS MON	L	L	H	L	4	C
C182	10	17-452A	REACTOR BLDG EXH PLENUM CH 1	L	L	H	H	4	C
C182	10	17-452B	REACTOR BLDG EXH PLENUM CH 2	L	L	H	H	4	C
C182	10	17-453A	SPENT FUEL POOL CHANNEL A	L	L	H	H	4	C
C182	10	17-453B	SPENT FUEL CHANNEL B	L	L	H	H	4	C
C182	10	17-454	CONTROL ROOM AIR INTAKE	L	L	H	M	4	C
C182	11	18-50	CONTROL ROOM LOW RANGE AREA MON	L	L	H	L	4	C
C182	11	18-51A	REFUEL FLOOR LOW RANGE AREA MON	L	L	H	L	4	C
C182	11	18-51B	REFUEL FLOOR STAIRWAY AREA MON	L	L	H	L	4	C
C182	11	18-51C	NEW FUEL STORAGE VAULT AREA MON	L	L	H	L	4	C
C182	11	18-51D	CONTAMINATED EQUIPMENT AREA MON	L	L	H	L	4	C
C182	11	18-51E	CONTAMINATED STORAGE AREA MON	L	L	H	L	4	C
C182	11	18-51F	RADWASTE ACCESS AREA MON	L	L	H	L	4	C
C182	11	18-51G	CLEAN UP SYSTEM AREA ACCESS MON	L	L	H	L	4	C

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C182	11	18-51H	CONTROL ROD DR REPAIR AREA MON	L	L	H	L	4	C
C182	11	18-51I	EAST CRD MODULE AREA MON	L	L	H	L	4	C
C182	11	18-51J	WEST CRD MODULE AREA MON	L	L	H	L	4	C
C182	11	18-51K	TIP DRIVE AREA MON	L	L	H	L	4	C
C182	11	18-51L	HPCI TURBINE AREA MON	L	L	H	L	4	C
C182	11	18-51M	CONTROL ROD DRIVE PUMP AREA MON	L	L	H	L	4	C
C182	11	18-51N	RCIC EQUIPMENT AREA MON	L	L	H	L	4	C
C182	11	18-51P	EAST CORE SPRAY & RHR AREA MON	L	L	H	L	4	C
C182	11	18-51Q	WEST CORE SPRAY & RHR AREA MON	L	L	H	L	4	C
C182	11	18-51R	CONTROL LAB AREA MONITOR	L	L	H	L	4	C
C182	11	18-51S	TG FRONT STANDARD AREA MONITOR	L	L	H	L	4	C
C182	11	18-51T	CONDENSATE DEMIN OPERATING AREA	L	L	H	L	4	C
C182	11	18-51U	CONDENSATE SYSTEM AREA MON	L	L	H	L	4	C
C182	11	18-51V	FEEDWATER PUMP AREA MON	L	L	H	L	4	C
C182	11	18-51W	RADWASTE CONTROL ROOM AREA MON	L	L	H	L	4	C
C182	11	18-51X	SAMPLE TANK AREA MON	L	L	H	L	4	C
C182	11	18-51Y	CONVEYOR OPERATING AREA MON	L	L	H	L	4	C
C182	11	18-51Z	MACHINE SHOP AREA MON	L	L	H	L	4	C
C182	11	18-52	REFUEL FLOOR HIGH RANGE AREA MON	L	L	H	L	4	C
C182	11	18-53A	POWER SUPPLY FOR AREA MONITOR	L	L	H	L	4	C
C182	11	18-53B	POWER SUPPLY FOR AREA MONITOR	L	L	H	L	4	C
C182	11	18-53C	POWER SUPPLY FOR AREA MONITOR	L	L	H	L	4	C
C182	11	18-57A	TIP CUBICLE	L	L	H	L	4	C
C182	11	18-57B	CONTROL ROOM HIGH RANGE	L	L	H	L	4	C
C182	11	18-57C	OPERATING FLOOR	L	L	H	L	4	C
C182	11	ES 7774	POWER SUPPLY	L	L	H	L	4	C
C182	252D	RI 7571A	RECOMBINER BLDG INSTRUMENT ROOM	L	L	M	L	5	E
C182	252D	RI 7571B	RECOMBINER BLDG PUMP ROOM	L	L	M	L	5	E
C182	252D	RI 7612	STORAGE BUILDING	L	L	M	L	5	E

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C182	A	Monticello does not plan on changing these meters. These meters can be read with the necessary precision.					X		

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C182	B	These components have been replaced with new meters. The new meters have been subsequently reviewed.							
C182	C	Monticello will use the SPDS system to monitor area radiation levels and therefore will not move or correct the parallax problem that might occur with the use of these components.					X		
C182	D	These components do not have the parallax problem because of a mirrored background that helps insure alignment during the reading of the instrument.							
C182	E	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REFORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C211	6.5.4.1(a)	RECORDER	Pens, inks, and papers should be of high quality.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C211	6	LR 1278	HOTWELL LEVEL	L	L	M	M	5	
C211	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	L	M	M	5	
C211	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	L	L	L	H	4	
C211	2	NR 18-55	AREA RADIATION	L	H	H	L	3	
C211	2	RR 7993	DRYWELL CAM	L	H	H	M	3	
C211	20	TR 1712	COND & RFP BRGS TEMP	L	L	L	H	4	
C211	21	TR 2-2-31	RECIRC PUMP	L	L	M	H	4	
C211	25	TR 1720	DRYWELL COOLER TEMP RECORDER	L	L	H	M	4	
C211	259	AR-4018A		L	L	M	M	5	
C211	260	AR 4018B	O2/H2 CONCENTRATION CH B	L	L	M	M	5	
C211	252A	TR 7527	RECOMBINER TEMPERATURE DEG F	L	L	L	L	5	
C211	252D	RR 7573	OFFGAS COMP STORAGE	L	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C211		Monticello will solve this problem with improvements in Preventative Maintenance procedures that ensure the correct functioning of this CR equipment. Pen, ink, and paper quality will be reviewed.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C212	6.5.4.1(b)	RECORDER	Scales on recording paper should be the same as scales on the recorder.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C212	4	CR 12-144	CLEANUP INLET CONDUCTIVITY	L	L	L	M	5	
C212	4	FR 2-154	RECIRCULATION FLOW	L	L	L	L	5	
C212	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	L	L	H	M	4	
C212	5	FPR 2-3-95	CORE DP/TOTAL CORE FLOW	L	H	L	L	4	
C212	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	H	M	M	3	
C212	7	PR 1264	CONDENSER VACUUM	L	H	H	M	3	
C212	7	SR 1715	SPEED-VALVE & BYPASS POSITION	L	H	M	L	3	
C212	2	NR 17-154	OFFGAS RAD LEVEL	L	H	M	M	3	
C212	2	NR 17-455	REAC BLDG EXH PLENUM	L	L	H	H	4	
C212	2	NR 18-55	AREA RADIATION	L	H	H	L	3	
C212	2	RR 7433	LIQ PROCESS RAD	L	H	M	H	3	
C212	21	TR 2-184-26	M-G SET WINDINGS	L	H	M	H	3	
C212	257	RR 7858A	STACK NOBLE GAS	L	H	H	H	3	
C212	257	RR 7858C	STACK NOBLE GAS	L	H	H	H	3	
C212	257	RR 7859A	RBV NOBLE GAS	L	H	H	H	3	
C212	257	RR 7859C	RBV NOBLE GAS	L	H	H	H	3	
C212	258	RR 7858B	STACK NOBLE GAS	L	H	H	H	3	
C212	258	RR 7859B	RBV NOBLE GAS	L	H	H	H	3	
C212	258	RR 7859D	RBV NOBLE GAS	L	H	H	H	3	
C212	259	AR 4018A	O2/H2 CONCENTRATION CH A	L	L	M	M	5	
C212	260	AR 4018B	O2/H2 CONCENTRATION CH B	L	L	M	M	5	
C212	252A	FR 7676	OFFGAS FLOW TO STACK	L	H	L	H	3	
C212	252A	TR 7527	RECOMBINER TEMPERATURE DEG F	L	H	L	L	4	
C212	252B	FR 7492A	OFFGAS FLOW	L	H	L	L	4	
C212	252B	FR 7508A	#11 EDUCTOR STEAM FLOW & OUTLET	L	H	M	L	3	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C212	252C	FR 7492B	OFFGAS FLOW	L	H	L	L	4	
C212	252C	FR 7508B	#12 EDUCTOR STEAM FLOW & OUTLET	L	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C212		All recorders are provided with internal labels identifying the correct chart paper. Operators are instructed to install the appropriate recorder paper when replacement is necesary. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C213	6.5.4.1(d)	RECORDER	A takeup spool should be provided to receive completed recordings.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C213	26	02R-3285	% 02	L	L	M	L	5	
C213	26	FR 3275	N2 MAKE UP FLOW	L	L	M	L	5	
C213	26	TR 3276	MAKEUP AND PURGE N2 TEMPERATURE	L	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C213		This will not be corrected. Fan-fold paper has been adequate to date.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C214	6.5.4.1(i)	RECORDER	Paper speed adjustability for high and low speeds should be available.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C214	3	FR 10-143	RHR FLOW	L	L	H	M	4	
C214	3	LR 2-3-113	RPV LEVEL	L	L	H	H	4	
C214	3	LR 7409	D.W.FLR. & EQPT. DRAIN SUMPS	L	L	M	H	4	
C214	3	PLR 7251A	DW RAD/TORUS LVL/DW PRESS	L	L	H	L	4	
C214	3	PLR 7251B	DW RAD/TORUS LVL/DW PRESS	L	L	H	L	4	
C214	3	VR 7316	TURBINE VIBRATION	L	L	H	M	4	
C214	4	CR 12-133	CLEANUP OUTLET CONDUCTIVITY	L	L	L	M	5	
C214	4	CR 12-144	CLEANUP INLET CONDUCTIVITY	L	L	L	M	5	
C214	4	FR 2-154	RECIRCULATION FLOW	L	L	L	L	5	
C214	4	FR 2544	DISCHARGE FLOW	L	L	L	L	5	
C214	4	PR 2994	DRYWELL & SUPPR CHBR PRESS	L	L	H	M	4	
C214	4	TR 2-167	RECIRC TEMPERATURES	L	L	M	M	5	
C214	4	TR 2-3-90	VESSEL SHELL & FLANGE	L	L	L	L	5	
C214	5	7-46A	APRM LOCAL POWER LEVEL	L	L	H	H	4	
C214	5	7-46B	APRM LOCAL POWER LEVEL	L	L	H	H	4	
C214	5	7-46C	APRM LOCAL POWER LEVEL	L	L	H	H	4	
C214	5	7-46D	APRM LOCAL POWER LEVEL	L	L	H	H	4	
C214	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	L	L	H	M	4	
C214	5	FPR 2-3-95	CORE DP/TOTAL CORE FLOW	L	L	L	L	5	
C214	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	L	L	M	M	5	
C214	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	L	L	M	L	5	
C214	5	NR 7-45	SOURCE RANGE MONITOR LEVEL	L	L	H	L	4	
C214	5	TRR-3	COMPUTER TREND	L	L	L	L	5	
C214	5	TRR-4	COMPUTER TREND	L	L	L	L	5	
C214	6	CR 1263	CONDENSATE CONDUCTIVITY	L	L	L	M	5	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C214	6	LR 1278	HOTWELL LEVEL	L	L	M	M	5	
C214	6	PR 1149	FEEDWATER PRESSURE	L	L	M	L	5	
C214	6	TR 1148A/B	FEEDWATER TEMPERATURE	L	L	M	L	5	
C214	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	L	M	M	5	
C214	7	PR 1176	TURB THROTTLE & INST.	L	L	H	L	4	
C214	7	PR 1264	CONDENSER VACUUM	L	L	H	M	4	
C214	7	SR 1715	SPEED-VALVE & BYPASS POSITION	L	L	M	L	5	
C214	7	TR 1624	PRIMARY STEAM TO TURBINE TEMP	L	L	L	L	5	
C214	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	L	L	L	H	4	
C214	7	TR 7998	TURBINE-GEN BEARING METAL TEMP	L	L	M	H	4	
C214	7	TRR-2	COMPUTER TREND	L	L	L	L	5	
C214	2	NR 17-152	OFFGAS RAD LEVEL	L	L	H	H	4	
C214	2	NR 17-154	OFFGAS RAD LEVEL	L	L	M	M	5	
C214	2	NR 17-252	MN ST LINE RAD LEVEL	L	L	H	H	4	
C214	2	NR 17-353	CLSD COOL WTR/SERV WTR EFF RAD	L	L	H	M	4	
C214	2	NR 17-358	DISCHARGE CANAL MONITOR	L	L	H	H	4	
C214	2	NR 17-455	REAC BLDG EXH PLENUM	L	L	H	H	4	
C214	2	NR 18-55	AREA RADIATION	L	L	H	L	4	
C214	2	RR 7433	LIQ PROCESS RAD	L	L	M	H	4	
C214	2	RR 7993	DRYWELL CAM	L	L	H	M	4	
C214	13	HP 7035B	X-Y RECORDER	L	L	L	M	5	
C214	20	(MN GEN AMPERAGE)	MAIN GENERATOR AMPERAGE	L	L	L	M	5	
C214	20	(MN GEN VOLTAGE)	MAIN GENERATOR VOLTAGE	L	L	L	M	5	
C214	20	TR 1712	COND & RFP BRGS TEMP	L	L	L	H	4	
C214	20	TR 1730	TURB BRG & BRG DRAIN TEMP	L	L	L	H	4	
C214	20	TR 1804	CIRCULATING WATER	L	L	L	L	5	
C214	20	WR 7269	WIND SPEED/DIRECTION	L	L	H	H	4	
C214	21	TR 2-184-25	M-G SET OIL & BEARING TEMPS	L	L	M	H	4	
C214	21	TR 2-184-26	M-G SET WINDINGS	L	L	M	H	4	
C214	21	TR 2-2-31	RECIRC PUMP	L	L	M	H	4	
C214	21	TR 23-115	HPCI [SYSTEM TEMPERATURE]	L	L	H	H	4	
C214	25	TR 1720	DRYWELL COOLER TEMP RECORDER	L	L	H	M	4	
C214	26	O2R-3285	% O2	L	L	M	L	5	
C214	26	FR 3275	N2 MAKE UP FLOW	L	L	M	L	5	
C214	26	TR 3276	MAKEUP AND PURGE N2 TEMPERATURE	L	L	M	L	5	
C214	31	TR 1713	GENERATOR STATOR H2 GAS	L	L	L	M	5	
C214	31	TR 1714	GENERATOR FIELD TEMPERATURE	L	L	L	H	4	

C214	31	W-VAR/R	WATT-VAR	L	L	L	M	5
C214	257	RR 7858A	STACK NOBLE GAS	L	L	H	H	4
C214	257	RR 7858C	STACK NOBLE GAS	L	L	H	H	4
C214	257	RR 7859A	RBV NOBLE GAS	L	L	H	H	4
C214	257	RR 7859C	RBV NOBLE GAS	L	L	H	H	4
C214	258	RR 7858B	STACK NOBLE GAS	L	L	H	H	4
C214	258	RR 7858D	STACK NOBLE GAS	L	L	H	H	4
C214	258	RR 7859B	RBV NOBLE GAS	L	L	H	H	4
C214	258	RR 7859D	RBV NOBLE GAS	L	L	H	H	4
C214	259	AR 4018A	O2/H2 CONCENTRATION CH A	L	L	M	M	5
C214	260	AR 4018B	O2/H2 CONCENTRATION CH B	L	L	M	M	5
C214	252A	FR 7676	OFFGAS FLOW TO STACK	L	L	L	H	4
C214	252A	TR 7527	RECOMBINER TEMPERATURE DEG F	L	L	L	L	5
C214	252B	AR-7554A	OFFGAS OUTLET H2 CONC	L	L	M	L	5
C214	252B	FR 7492A	OFFGAS FLOW	L	L	L	L	5
C214	252B	FR 7508A	#11 EDUCTOR STEAM FLOW & OUTLET	L	L	M	L	5
C214	252C	AR-7554B	OFFGAS OUTLET H2 CONC	L	L	M	L	5
C214	252C	FR 7492B	OFFGAS FLOW	L	L	L	L	5
C214	252C	FR 7508B	#12 EDUCTOR STEAM FLOW & OUTLET	L	L	M	L	5
C214	252D	RR 7573	OFFGAS COMP STORAGE	L	L	M	L	5

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C214		Monticello will not make corrections to recorders that don't already have this feature. This feature has been included for those recorders that require it.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C215	6.5.4.1(j)	RECORDER	Annotation of recordings should be convenient.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C215	2	RR 7993	DRYWELL CAM	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C215		This recorder was changed. No further corrections are planned.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C216	6.5.4.1(k)	RECORDER	All data should be visible through the recorder window.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C216	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	L	L	M	M	5	A
C216	5	TRR-4	COMPUTER TREND	L	L	L	L	5	A
C216	6	CR 1268	CONDENSATE CONDUCTIVITY	L	M	L	M	4	A
C216	6	TR 1148A/B	FEEDWATER TEMPERATURE	L	L	M	L	5	A
C216	7	FR 1176	TURB THROTTLE & INST.	L	L	H	L	4	A
C216	7	TR 1624	PRIMARY STEAM TO TURBINE TEMP	L	L	L	L	5	A
C216	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	L	M	L	H	4	A
C216	7	TR 7998	TURBINE-GEN BEARING METAL TEMP	L	M	M	H	4	A
C216	7	TRR-2	COMPUTER TREND	L	M	L	L	4	A
C216	7	VR 1716	VIBRATION RECORDER	L	M	M	H	4	A
C216	2	NR 17-154	OFFGAS RAD LEVEL	L	L	M	M	5	A
C216	2	NR 17-252	MN ST LINE RAD LEVEL	L	L	H	H	4	A
C216	2	NR 17-353	CLSD COOL WTR/SERV WTR EFF RAD	L	L	H	M	4	A
C216	2	NR 17-455	REAC BLDG EXH PLENUM	L	L	H	H	4	A
C216	2	RR 7993	DRYWELL CAM	L	M	H	M	4	A
C216	20	(MN GEN AMPERAGE)	MAIN GENERATOR AMPERAGE	L	M	L	M	4	A
C216	20	(MN GEN VOLTAGE)	MAIN GENERATOR VOLTAGE	L	M	L	M	4	A
C216	20	TR 1712	COND & RFP BRGS TEMP	L	M	L	H	4	A
C216	20	TR 1730	TURB BRG & BRG DRAIN TEMP	L	M	L	H	4	A
C216	20	TR 1804	CIRCULATING WATER	L	M	L	L	4	A
C216	20	WR 7269	WIND SPEED/DIRECTION	L	M	H	H	4	A
C216	21	TR 2-166	SAFETY & BLOWDOWN VALVES	L	M	H	M	4	A
C216	21	TR 2-184-25	M-G SET OIL & BEARING TEMPS	L	M	M	H	4	A
C216	21	TR 2-184-26	M-G SET WINDINGS	L	M	M	H	4	A
C216	21	TR 2-2-31	RECIRC PUMP	L	M	M	H	4	A
C216	21	TR 2-3-89	REACTOR VESSEL	L	M	H	M	4	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C216	25	TR 1720	DRYWELL COOLER TEMP RECORDER	L	M	H	M	4	A
C216	26	02R-3285	% 02	L	M	M	L	4	A
C216	26	FR 3275	N2 MAKE UP FLOW	L	M	M	L	4	A
C216	26	TR 3276	MAKEUP AND PURGE N2 TEMPERATURE	L	M	M	L	4	A
C216	31	TR 1713	GENERATOR STATOR H2 GAS	L	M	L	M	4	A
C216	31	W-VAR/R	WATT-VAR	L	M	L	M	4	A
C216	252B	FR 7492A	OFFGAS FLOW	L	L	L	L	5	B
C216	252C	FR 7492B	OFFGAS FLOW	L	L	L	L	5	B
C216	252D	RR 7573	OFFGAS COMP STORAGE	L	M	M	L	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C216	A	Monticello proposes to fix this problem with new covers where necessary, additional preventative maintenance (cleaning), and changes in labeling to clear the recorder window area.	X			X			
C216	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C217	6.5.4.2(a)(2)	RECORDER	Continuous recorders should record each channel in a distinctly different colored ink.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C217	4	FR 2544	DISCHARGE FLOW	L	H	L	L	4	
C217	4	PR 2994	DRYWELL & SUPPR CHBR PRESS	L	H	H	M	3	
C217	2	NR 17-358	DISCHARGE CANAL MONITOR	L	H	H	H	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C217		A review of the Monticello control room recorders reveals that this criteria is being complied with. Operators monitor these recorders daily and ensure proper inking of these recorders as appropriate. The Monticello Instrument & Control PM program ensures that these instruments are maintained in an acceptable state of repair. No additional corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C218	6.5.4.2(b)(2)	RECORDER	Discrete recorders should be equipped to display the channel being plotted.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C218	25	TR 1720	DRYWELL COOLER TEMP RECORDER	L	H	H	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C218		Monticello will review the preventative maintenance procedures so that this window will clearly display the data point being sampled.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C219	6.5.4.2(b)(3)	RECORDER	Channel identification on discrete recorders should provide clear, sharp, small numbering.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C219	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	M	H	L	H	2	
C219	2	NR 18-55	AREA RADIATION	M	H	H	L	2	
C219	21	TR 2-184-25	M-G SET OIL & BEARING TEMPS	M	H	M	H	2	
C219	21	TR 2-2-31	RECIRC PUMP	M	H	M	H	2	
C219	25	TR 1720	DRYWELL COOLER TEMP RECORDER	M	H	H	M	2	
C219	31	TR 1713	GENERATOR STATOR H2 GAS	M	H	L	M	3	
C219	252D	RR 7573	OFFGAS COMP STORAGE	M	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C219	A	This recorder was inadvertently included in the HED. It is not a discrete recorder.							
C219	B	Monticello will review preventative maintenance procedures to ensure they are maintained better with frequent changes of the ribbons so that the numbers are clear.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
C220	6.5.4.2(b)(4)	RECORDER	Discrete recorders should have the capacity for selection of any channel for immediate display.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
C220	6	CR 1268	CONDENSATE CONDUCTIVITY	M	M	L	M	4	
C220	7	TR 1717	TEMPERATURE/EXPANSION RECORDER	M	M	L	H	4	
C220	7	TR 7998	TURBINE-GEN BEARING METAL TEMP	M	M	M	H	4	
C220	7	VR 1716	VIBRATION RECORDER	M	M	M	H	4	
C220	2	NR 18-55	AREA RADIATION	M	M	H	L	4	
C220	20	TR 1712	COND & RFP BRGS TEMP	M	M	L	H	4	
C220	20	TR 1730	TURB BRG & BRG DRAIN TEMP	M	M	L	H	4	
C220	20	TR 1804	CIRCULATING WATER	M	M	L	L	4	
C220	21	TR 2-184-25	M-G SET OIL & BEARING TEMPS	M	M	M	H	4	
C220	21	TR 2-184-26	M-G SET WINDINGS	M	M	M	H	4	
C220	21	TR 2-2-31	RECIRC PUMP	M	M	M	H	4	
C220	21	TR 23-115	HPCI SYSTEM TEMPERATURE	M	M	H	H	4	
C220	25	TR 1720	DRYWELL COOLER TEMP RECORDER	M	M	H	M	4	
C220	31	TR 1713	GENERATOR STATOR H2 GAS	M	M	L	M	4	
C220	252D	RR 7573	OFFGAS COMP STORAGE	M	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
C220		Monticello does not plan to add any recorders with this capability; they have been installed where necessary.					X		

E-152

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 1	6.1.1.1(a)	ANNUNCIATOR	Alarm on fuel skimmer tank doesn't show high level to avoid overflow. Possible need for CR indication.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 1	4	C04-B-33	FUEL POOL COOLING SYSTEM TROUBLE	H	H	L	L	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 1		The expected response to the annunciator is for a CR operator to contact an aux operator to investigate the problem. In order to provide for better information for the aux operator the Fuel Pool Skimmer Surge Tank level indication has been added to the Radwaste CR. Control of the Fuel Pool Surge Tank dump valve has been added to the Radwaste CR. Monticello does not plan to make additional changes to correct this problem.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 2	6.2.1.1		CR phone line was accidently cut. A redundant capability should be installed for communications.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 2		--		H	H	-	-	I	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 2		Monticello will review control room communications capabilities to ensure that the error of cutting a telephone line will not result in the total loss of off-site communications.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 3	6.4.1.1(c)		Poor access and visibility to jumper terminals EE51-EE54, and other terminals.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 3		--		H	H	-	-	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 3		Monticello will modify the operation of these controls. If the terminals are routinely jumpered for surveillance testing they will be redesigned for use with a keylocked switch to eliminate the need for jumpering.	X	X					

E-155

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 4	6.4.1.1(c)		Manual operation of relay damaged operation of relay on RCIC isolation logic.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 4		--		H	M	-	-	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 4		Monticello will redesign these components with a keylocked switch that does not require the relays to be manipulated directly.		X					

E-156

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 5	6.5.1.1(b)		No clear indication of auto start for Diesel Generator led to misinterpretation. Also true for Group II-V isolation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 5	8	(11 DG AUTO ST RST)		H	H	H	L	1	
E 5	G	(12 DG AUTO ST RST)	12 DG AUTO START RESET	H	H	H	L	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 5		Monticello will provide the required status information for the E. Diesel Generators and review the need for this information for Group II thru V isolation valves.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 6	6.5.1.1(b)	LIGHTS	Indicating light failed to show failed relay. Led to failure of emergency bearing oil pump start.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 6	7	HS-3109	EMERGENCY BRNG OIL PUMP P-63	H	H	L	M	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 6		Modifications were made as result of SOE 83-13 that corrected this problem.						X	

E-158

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 7	6.3.1.2(a)		Alarm setpoint for chlorine detector is set too low.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 7	20	C20-B-01	CHLORINE CL2 CONCENTRATION HIGH	H	H	L	H	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 7		Monticello will change the Cl system and eliminate the need for a Cl monitor and alarm.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 8	6.6.1.1	SWITCH	Power switch to wide range gas monitor poorly labelled, causing inadvertent power loss.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 8	2	(OFFGAS/STKGAS MON)	OFFGAS/STKGAS RAD MON POWER					C	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 8		This component was fixed earlier in the review, after the HED was written. The component has been subsequently reviewed.							

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 9	6.1.1.1(a)	ANNUNCIATOR	No annunicator for EFT actuated Cl monitor when paper runs out.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 9		--		H	H	-	-	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 9		Corrective actions have been taken. A procedure has been implemented to change detector paper on a predetermined schedule to prevent the problem.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 11	6.1.1.1(b)		Operator could not view scram solenoid status from the primary operating area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 11	5	DS1A	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 11	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 11		This has been corrected by redesign.						X	

E-162

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
E 12	6.1.1.1(b)	LIGHTS	Operator could not get feedback on scram logic status after attempting a reset. Solenoid status indicators were on the back panel

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
E 12	5	DS1A	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	
E 12	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	H	H	H	H	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
E 12		This has been corrected.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 1	6.1.1.7		Control room becomes crowded during emergencies and startups.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 1			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 1		Administrative procedures exist that provide control of personnel in the control room. This policy will be enforced to limit personnel in the control room to an acceptable level.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 2	6.1.1.1(b)		Off-gas panel is not near C05 or C08, and this location has made the boards more difficult to operate.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 2	252A			M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 2		The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERINS DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 3	6.1.2.7(a)		Communication desk is too small.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 3			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 3		This was solved by the new operator's workstation.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 4	6.1.1.3(a)		Operators stand in front of C05.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 4	5			M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 4		The redesign of the workstation included a feature which discourages operators from lingering in the C05 area. Administrative controls are in place to control CR activities and can be enforced.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 5	6.1.1.1(b)		Offgas/recombiner, rad and temp monitors, and SBGT are not close enough to C05 during emergency.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 5	2			M	H	-	-	2	A
I 5	10			M	H	-	-	2	A
I 5	11			M	H	-	-	2	A
I 5	252A			M	H	-	-	2	B
I 5	252B			M	H	-	-	2	B
I 5	252C			M	H	-	-	2	B
I 5	252D			M	H	-	-	2	B
I 5	24A			M	H	-	-	2	C
I 5	24B			M	H	-	-	2	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 5	A	The SPDS system will provide this informtion to the operator at his work station. No corrective actions are planned.					X		
I 5	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 5	C	The significance of this dispcrepancy has been evaluated. The Iocation of the panel does not have a significant impact on operators. A review of the arrangement of the controls and of the annunciators is being made. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 6	6.1.5.7(a)		Wall color and flooring is unsatisfactory--dull and worn out. Carpeting would improve the CR environment.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 6			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 6		Monticello will change the wall color and add carpeting.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 7	6.1.5.1		Control room is too hot or cold.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 7			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 7		Monticello will evaluate compliance with NUREG-0700 in this regard. The EFT system is relatively new and increased Preventative Maintenance or modifications may be required.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 8	6.1.5.5		Ventilation is noisy.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 8			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 8		Monticello will review the EFT system to reduce the noise in that system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 9	6.1.5.3(f)		Glare problems affect control board legibility.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 9			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 9		Monticello will review the glare problem after making the workstation and carpeting changes. Monticello recognizes that changes to the lighting fixtures may be required. Changes will be made where required.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 10	6.1.5.1		Humidity control during the summer is unsatisfactory--wide swings in humidity.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 10			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 10		This problem is related to the installation of the EFT system. Monticello will review the operation and maintenance of the EFT system to comply with NUREG-0700 requirements for humidity control.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 11	6.5.1.1		Primary containment ventilation panels do not indicate interlocks.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 11	25		--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 11		Montecello will review the addition of status panels to indicate the operation of the primary containment ventilation system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 12	6.1.1.1(b)		Important displays and controls are located in back areas of the control room.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 12			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 12		This comment from an operator is general, and is covered more specifically by other HEDs.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 13	6.1.1.1(a)		Lock-up scoop tube should be controlled inside the CR instead of at M-G set.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 13			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 13		Corrective actions have been taken. Controls have been installed on panel C04 providing CR operators with the capability to lock the A and/or B Rx Recirc Scoop Tubes.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 14	6.8.1.1(b)		Reposition emergency SW pumps now in RHR section.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 14	3	10A-S22A	#11 EMERGENCY S.W. PUMP	M	M	H	M	4	
I 14	3	10A-S22B	12 EMERGENCY S W PUMP	M	M	H	M	4	
I 14	3	HS-4025A	13 EMERGENCY SW PUMP	M	M	H	L	4	
I 14	3	HS-4025B	14 EMERGENCY SW PUMP	M	M	H	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 14		Monticello will relocate the controls for #11 and #12 ESW Pumps to panel C08 near their associated Emergency Diesel Generators.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 15	6.8.1.1(b)	RCMBNR ELEC SUPPLY	MCC 124/125 and MCC 115/116 are not located properly.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 15	7	52-110 CS	ACB 52-110 MCC 115/116	M	M	M	M	4	
I 15	7	52-206 CS	ACB 52-206 MCC 124/125	M	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 15		Monticello will relocate these components to a more appropriate area.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 17	6.5.1.2(b)	ECCS LOOP FLOW	mV meter on C03 (RHR) should read as flow.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 17	3	FI 7188		M	L	M	L	5	
I 17	3	FI 7189		M	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 17		Monticello does not plan to change this instrumentation. It is installed just for testing and not for normal or emergency operations. The operators have additional instrumentation that provides direct units for this parameter.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 18	6.1.1.1(b)		These proc's require two ops--recbnr and condensate vacuum, off-gas/standby gas treatment, in-core probe. Change panel layout.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 18			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 18		Monticello feels that adequate control room staffing is provided to perform normal control room activities, this includes the performance of the referenced procedures. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 19	6.8.1.1(b)		SRV blowdown should be monitored at C05 (HPCI PI is not suitable).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 19	3			M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 19		Monticello will use the SPDS system to provide Rx pressure at panel C03 with backup from the current HPCI instrumentation.					X		

E-182

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 20	6.1.1.1(b)		N2 into drywell, purge flow, O2-indicators in back, controls in front-purging requires ops to shuttle back and forth.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 20	3			L	H	-	-	3	
I 20	26		--	M	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 20		Purging and inerting/deinerting of containment is an infrequently performed task. This task is typically performed during startup or shutdown when additional staff are provided. Monticello plans no changes to correct this concern.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 21	6.8.1.1(b)		Atmospheric control has a fan control on back panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 21	26	(DRYWELL PURGE FAN)	V-EF-25 DRYWELL PURGE FAN	M	L	L	M	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 21		Monticello will move the control of V-EF-25 to panel C04, near the Primary Containment Vent and Purge System area.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 22	6.1.1.1(b)		RHR to WST to pump down torus--procedure or layout should be redesigned to permit completion by single operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 22	3			M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 22		The transfer of water into this tank must be coordinated with the Radwaste Operator. Adding CR operation would mean adding several other systems, as many systems empty into this tank. No correction is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 23	6.1.1.1(a)		Change the location of the EFT and scoop tube controls to keep operators in the control room when completing these procedures.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 23			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 23		Scoop tube: The subject scoop tube functions (scoop tube lock) have already been located to the control room. EFT: The operator may have made this comment because there are too many nuisance alarms on the system. The latest revisions of operating and surveillance procedures along with operator training has greatly reduced operator activities associated with the EFT system. Presently, operator activities associated with the EFT panels are infrequent. No additional corrective actions are planned for this HED.					X	X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 24	6.8.1.1(b)	DRN FLW REGULATOR	Control for Rx water on C04 is in the wrong area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 24	4	12-142	RWCU TEMP SELECTOR	M	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 24		Monticello will make no changes to the position of this component. Interactions with other RWCU instrumentation requires that it remain at its present location.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 25	6.6.6.1		Some RHR valves are common to both systems--mimics would enhance the panel layout for these controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 25	3			L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 25		Monticello will continue to review this problem. Rearrangement of controls and mimic lines will be reviewed to emphasis this relationship.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 26	6.8.2.2		RBCCW pumps should be located on the right side of the panel instead of the left side.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 26	6	42-3318/CS	REAC BLDG CW PUMP P-6A	M	M	H	M	4	
I 26	6	42-4218/CS	REAC BLDG CW PUMP P-6B	M	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 26		This concern is related to the RBCCW supply valve to the reactor water cleanup system. Monticello will relocate this component with the other RWCU system components.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 27	6.8.1.1(b)		HPCI turbine/pump controls do not follow the sequence of operation, and they often require moving panel to panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 27	3			M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 27		A more functional arrangement of the HPCI system controls is planned. In additional mimic line will be provided where practicable to enhance the visual functional relationship of these controls.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 28	6.8.3.2(c)		Close packing of controls and displays creates ambiguities when locating panel components.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 28			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 28		Monticello will enhance the control boards with new labels that comply with the Monticello convention specification.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 29	6.1.1.1		The EFT equipment is at an inconvenient location on a back panel and near kitchen.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 29			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 29		Monticello will relabel the equipment near the kitchen to help identification.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 30	6.8.1.1(b)		The panel design does not bring together the ECCS and emergency power control/displays.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 30	3			M	H	-	-	2	
I 30	8			M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 30		Color coding is provided to show the relationship between the ECCS divisions and their associated emergency power sources. Additional methods of depicting this relationship will be evaluated.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 31	6.8.1.1(c)		The post accident monitors are unnecessarily mounted in the main CR area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 31	257		--	M	L	-	-	4	
I 31	258		--	M	L	-	-	4	
I 31	259			M	L	-	-	4	
I 31	260			M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 31		Monticello will not move these components. A number of considerations went into the decision to locate these controls at their present location including accessibility during possible accident conditions.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 32	6.1.1.1		Left half of C20 is not located in a useable position.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 32	20		--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 32		Monticello will leave filing cabinets in their present position. An evaluation of lighting will be made after the installation of carpeting and ceiling tiles.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 33	6.4.3.1(b)	APRS TEST	APRS test switch has no detent.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 33	3	2E-S5A	--	M	M	M	L	4	
I 33	3	2E-S5B	--	M	M	M	L	4	
I 33	3	2E-S5C	--	M	M	M	L	4	
I 33	3	2E-S5D	--	M	M	M	L	4	
I 33	3	2E-S5E	--	M	M	M	L	4	
I 33	3	2E-S5F	--	M	M	M	L	4	
I 33	3	2E-S5G	--	M	M	M	L	4	
I 33	3	2E-S5H	--	M	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 33		Monticello will correct this problem through a redesign of the the functional operation of these control switches.		X					

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 34	6.5.1.1(b)	CONDENSOR VACUUM	Condensor vacuum reads out in "vacuum" instead of "inches Hg Abs."

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 34	7	PR 1264	CONDENSER VACUUM	M	H	H	M	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 34		Monticello will modify the instrument to change the indication to "In Hg Vacuum."	X						

E-197

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 35	6.5.1.2(a)		RWCW dump flow scale is now scaled at 0-200 gpm but normally used at about 20 gpm.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 35	4	FI 12-140	DUMP FLOW	M	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 35		Monticello engineering advises that the range should not be changed from the wide-range indication. At the low value of 20 gpm, the resolution is appropriate to the control requirements.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 36	6.5.1.5(f)	CV, TA, TAD	Condensor vacuum recorder, turbine speed and acceleration indication are difficult or confusing to read.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 36	7	PR 1264	CONDENSER VACUUM	M	H	H	M	2	A
I 36	7	SI 1770	TURBINE ACCELERATION	M	H	L	M	3	B
I 36	7	TADI 7445	TURBINE ACCEL GUIDE	M	H	L	M	3	C
I 36	7	TLDI 7444	TURBINE LOADING GUIDE	M	H	L	M	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 36	A	Monticello plans to modify this equipment to solve the need to translate units on the condenser vacuum.	X						
I 36	B	Additional training will be provided to clarify the operation of this instrument.			X				
I 36	C	Additional training on these instruments will be provided to eliminate operator confusion.			X				

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 37	6.9.1.1(c)	RP, RP A, RP B	Rx pressure indication is not close to SRV valve controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 37	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	M	H	M	L	3	
I 37	5	PI 6-90A	REACTOR PRESS A	M	H	H	M	2	
I 37	5	PI 6-90B	REACTOR PRESS B	M	H	H	M	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 37		This parameter will be provided with the SPDS displays.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 38	6.8.1.1(b)	RTCR VES LEV A & B	Rx water level indication is difficult to use (when using HPCI system).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 38	3	LI 6-94A	REACTOR VESSEL LEVEL A	M	M	M	L	4	
I 38	3	LI 6-94B	REACTOR VESSEL LEVEL B	M	M	M	L	4	
I 38	5	LI 2-3-85A	RPS LEVEL	M	M	H	L	4	
I 38	5	LI 2-3-85B	RPS LEVEL	M	M	H	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 38		This parameter will be provided with the SPDS displays.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 39	6.1.1.1(b)		Scram solenoid lights are not on the main control panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 39	15		--	H	L	-	-	1	
I 39	17		--	H	L	-	-	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 39		This HED has been corrected by moving the lights to panel C05.						X	

E-202

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 40	6.5.1.2		Torus temperature indication is unsatisfactory.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 40	21	TR 2-166	SAFETY & BLOWDOWN VALVES	M	M	H	M	4	
I 40	21	TR 23-115	HPCI SYSTEM TEMPERATURE	M	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 40		This has been solved with the SPOTMOS displays of torus temperature.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 41	6.8.1.1(b)		A CRT display is not located near the turbine controls for turbine roll.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 41			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 41		Monticello will complete a Process Computer Replacement Project that will solve this problem. It is scheduled for the 1987 Refueling Outage.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 42	6.3.1.3		There is no first-out annunciator for Rx scram or any other plant system.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 42			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 42		Resolution to this concern will be provided in the review of the control room alarm system. Monticello does have a sequence-of-event log which documents the scram parameter that initiated the scram.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 43	6.8.1.1(b)		A condensor vacuum meter (Hg) is not available for reference to Rx scrams, etc.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 43			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 43		The condenser vacuum capability will be provided by a design change modifying the current component.		X					

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
1 44	6.5.1.1(b)		Diesel generator has no RPM indicator to judge when DG is approaching synchronous speed.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 44			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 44		Monticello will provide the Diesel Generator speed indicator for both DGs.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 45	6.5.1.2(d)		There is no additional Rx water level indication for when Yarway and Gemac meters go off-scale.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 45		A review of the Monticello RPV level indication reveals that RPV water level is provided from below the reactor core to the top of the RPV. No instrument changes are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 46	6.1.1.1(a)		Control system for maintaining delta-P between dry well and torus is only local control.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 46			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 46		System has not been used for a number of years and present plans do not include using the system in the future. No system changes are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 47	6.9.1.1(a)		Rx pressure indication is not in proximity of pressure control station on C07.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 47	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	M	M	M	M	4	
I 47	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	M	M	M	L	4	
I 47	7	PI 1822	MAIN STEAM PRESSURE	M	M	M	L	4	
I 47	7	POI 1793	MPR PRES CHG H WHL POS	M	M	M	M	4	
I 47	7	POI 1796	PRESSURE CONTROL POSITION	M	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 47		Monticello plans to relocate PI-1822 to this area. In addition, the SPDS display will provide a backup source of reactor pressure indication in this area.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 48	6.9.1.1(a)	REACTOR LEVEL	Wide range level indication is not provided on C05 near the feedwater controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 48	3	LI 2-3-91A	REACTOR LEVEL A	M	M	H	H	4	
I 48	3	LI 2-3-91B	REACTOR LEVEL B	M	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 48		The SPDS will provide this information at panel C05.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 49	6.1.1.1(a)		Cooling tower pump controls are not provided in the main CR.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 49			COOLING TOWER PUMP CONTROLS	M	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 49		These pumps can be stopped from the control room by de-energizing the 17 or 18 Bus. Further cooling tower controls are not planned.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 50	6.1.1.1(a)		Deicing valve, return gates, and discharge gate controls are not provided in the main CR.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 50			DISCHARGE STRUC,CLG TWR RETURN	M	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 50		The deicing valve is manipulated very infrequently (once per week) and no correction is planned. Return gates: These are infrequently used controls. They are used in the spring and fall of the year when river ice creates intake structure problems. No correction is planned. Discharge gates: This is infrequently used equipment. Frequency of use does not justify providing these controls in the main control room.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 51	6.1.1.1(a)		Air compressor controls are not provided in the main CR.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 51			AIR COMPRESSOR CONTROLS	M	H	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 51		Auto-operation of air compressors automatically control operation of the system compressors. If problems develop, local inspection is required to respond to and/or correct these problems. No corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 52	6.5.1.6		Coding for safety systems would be useful.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 52			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 52		Monticello plans an enhancement approach where safety systems and the associated equipment will be labeled with special symbols.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 53	6.6.6.1		ECCS control boards have no flow path or other layout enhancement.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 53			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 53		System enhancements are planned. These include; area demarcation, mimic lines, and better functional arrangement of controls, if appropriate.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 54	6.5.1.2	RECIRC LOOP A,B--RL	Rx water level and steam press/temp displays are unsatisfactory.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 54	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	M	H	M	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 54		Monticello has replaced these components since the original comment was made. The review team will inspect the new instruments during the verification and validation activity.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 55	6.5.1.1(b)		Group isolation and scram could benefit from a large dedicated display.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 55			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 55		Monticello will depend on the SPDS for the display of this information.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 56	6.5.1.1(b)		Emergency filtration train has no summary display for determining current operating mode.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 56	263A			M	M	-	-	4	
I 56	264B			M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 56		Monticello will review the addition of enhancements or a small status panel for showing system operation. Presently the operators do not have this information.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 57	6.8.1.1(b)	REAC VESSEL LVL	Reactor water level recorder on C05 is not in a useful position.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 57	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	M	H	H	M	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 57		The SPDS system will provide backup reactor water level at almost any location that operators need this information. No other corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 58	6.9.1.1(a)		Blowdown valves and associated indicators are on adjacent panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 58	3	2E-S1A	RELIEF VALVE A RV-71A	M	H	H	H	2	
I 58	3	2E-S1B	RELIEF VALVE B RV-71B	M	H	H	H	2	
I 58	3	2E-S1C	RELIEF VALVE C RV-71C	M	H	H	H	2	
I 58	3	2E-S4D	RELIEF VALVE D RV-71D	M	H	H	H	2	
I 58	3	2E-S4E	RELIEF VALVE E RV-71E	M	H	H	H	2	
I 58	3	2E-S4F	RELIEF VALVE F RV-71F	M	H	H	H	2	
I 58	3	2E-S4G	RELIEF VALVE G RV-71G	M	H	H	H	2	
I 58	3	2E-S4H	RELIEF VALVE H RV-71H	M	H	H	H	2	
I 58	5	FPR 6-98	RX PRESS/TURB STEAM FLOW	M	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 58		The SPDS system will bring this Rx press indication to the left side of panel C03, closer to the ADS/ECCS systems.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 59	6.5.1.1(b)		Group II isolation does not have valve lineup identification for reset.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 59	3			L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 59		Monticello will review the possibility of putting this information on the SPDS displays or enhancements to the panel. Procedures will be modified to assist the operator with a checklist when checking the valve lineups on this system.				X			X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 60	6.8.1.1(b)		Off-gas flow requires consideration of condenser vacuum at the same time, but indication is not available.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 60	7	PR 1264	CONDENSER VACUUM	M	H	H	M	2	A
I 60	252A			M	H	-	-	2	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 60	A	This recorder will remain on panel C07. Indication on panel C252 will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
I 60	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 61	6.5.4.2(b)		Multipoint recorders are slow cycling overloaded with too many channels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 61	6	CR 1268	CONDENSATE CONDUCTIVITY	M	H	L	M	3	
I 61	2	RR 18-55	AREA RADIATION MONITOR RECORDER	M	H	H	L	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 61		Monticello does not plan to change these recorders. Improved preventative maintenance will help the operation of the equipment. The ARM recorder has adjacent monitors available for confirmation of current data.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 62	6.5.4.1		Condensate conductivity and area radiation monitor graphic recorders are unsatisfactory.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 62	6	CR 1268	CONDENSATE CONDUCTIVITY	M	H	L	M	3	A
I 62	2	RR 18-55	AREA RAD MONITOR	M	H	H	L	2	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 62	A	Monticello will remove this recorder from panel C06. Further evaluation of the need for this recorder will be made prior to any decision for replacing this device.		X					
I 62	B	The area radiation monitor recorder has been replaced. No additional corrective action is planned.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 63	6.1.2.5(b)		Radiation monitors are placed too high and too low on the back panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 63	2		AREA RADIATION MONITORS	M	H	M	L	3	
I 63	10		AREA RADIATION MONITORS	M	H	M	L	3	
I 63	11		AREA RADIATION MONITORS	M	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 63		These components are not used frequently enough to merit relocation. No correction is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 64	6.5.1.5(e)		Exponential meters on rad. monitors and elsewhere are "tricky" and require special training.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 64	3			M	H	-	-	2	
I 64	2			M	H	-	-	2	
I 64	10			M	H	-	-	2	
I 64	11			M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 64		The Monticello operator training program provides adequate training in the reading of non-linear meter scales. If necessary these meter scales will be enhanced with additional scale markings. No other corrective actions are planned.			X				

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 65	6.5.1.1(f)		Static electricity affects edgewise meters when touching cover glass.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 65			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 65		Monticello will review this problem after the carpeting is installed in the control room, and then check the effectiveness of the carpet grounding and various antistatic sprays.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 66	6.5.4.1(f)		Some chart recorders have complex paper paths and are difficult to refill.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 66			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 66		It will be determined which recorders are considered problem recorders for chart paper replacement. Diagrams identifying paper path and information tags if appropriate will be provided.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 67	6.5.3.1(a)		Some bulbs are difficult to replace: APRM and RBM cabinets, indicators above valves and breakers, and annunciators.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 67			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 67		Monticello will solve this problem with specialized tool(s) for their replacement.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 68	6.5.1.1(c)	TV--RP TR BYPS SW	Turbine vibration meter and M-G set bypass switches may be unnecessary.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 68	3	VR 7316	TURBINE VIBRATION	M	L	H	M	4	A
I 68	31	12	RECIRC PUMP #12 TRIP BYPASS	M	L	H	H	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 68	A	Monticello feels that these devices are required. No corrective action is planned.					X		
I 68	B	These switches have been eliminated.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 69	6.5.1.1(f)		Graphic recorders stick occasionally.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 69			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 69		The Monticello I&C PM program ensures that these type problems are minimized. If these type problems are reported by operators,the PM program responds by increasing the frequency of the instrument PM if necessary. No additional corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 70	6.5.1.1(f)		Meters may fail upscale, downscale, or as-is. There is no quick check for display failure.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 70			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 70		Monticello operators are expected to review multiple instrumentation when monitoring parameters to ensure the validity of any instrument's reading.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 71	6.4.1.1(a)	REAC MODE RPS/PCIS	Rx mode switch is imprecise and difficult to position.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 71	5	5A-S1	REACTOR MODE RPS/PCIS	M	H	H	H	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 71		Monticello has not experienced significant problems with this switch. Problems with the Mode switch is a generic BWR problem. The BWR Owners group is funding research on this device. Monticello will consider replacing this device when an improved switch is available.					X		X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 72	6.4.1.1(a)		Recirc. controls, recirc. speed control posts, and CS-90 rglr vol adjust are too coarse and do not have required precision.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 72	4	SIC 2-184-16A	RECIRC PUMP A SPEED CONTROL	M	M	L	H	4	A
I 72	4	SIC 2-184-16B	RECIRC PUMP B SPEED CONTROL	M	M	L	H	4	A
I 72	8	290	REGULATOR VOLTAGE ADJUST	M	M	L	M	4	A
I 72	5	FC 2-184-14	MASTER RECIRC FLOW CONTROL	M	M	L	L	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 72	A	A review of these controls revealed that it would not be advisable to de-sensitize these controls. No corrective actions are planned.					X		
I 72	B	This instrument will be removed from panel C04.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 73	6.8.2.3(b)		Diesel generator voltage and speed controls are mirror-imaged.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 73	8	190-DG1/CS	NO.11 DIESEL GEN VOLT ADJUST	M	M	H	M	4	
I 73	8	190-DG2/CS	NO.12 DIESEL GEN VOLT ADJUST	M	M	H	M	4	
I 73	8	DG1/CS	NO.11 DIESEL GEN CONTROL	M	M	H	M	4	
I 73	8	DG2/CS	NO.12 DIESEL GEN CONTROL	M	M	H	M	4	
I 73	8	GSC1/CS	NO.11 DIESEL GEN SPEED ADJUST	M	M	H	M	4	
I 73	8	GSC2/CS	NO.12 DIESEL GEN SPEED ADJUST	M	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 73		Monticello will correct this mirror image problem.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 74	6.4.1.2(a)		Following switches could be inadvertently activated: MSIV sw, EPR stop button, recirc M-G scoop tube lock reset buttons.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 74	4	2A-S2A	SCOOP TUBE A POWER	M	H	L	M	3	A
I 74	4	2A-S2B	SCOOP TUBE B POWER	M	H	L	M	3	A
I 74	3	16A-S3D	STEAM ISOLATION VALVE 2-80D	M	H	H	H	2	B
I 74	3	16A-S4D	STEAM ISOLATION VALVE 2-86D	M	H	H	H	2	B
I 74	7	PP 43Y	ELECT PRESSURE REG	M	H	L	L	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 74	A	Monticello will relocate the scoop tube reset pushbuttons to another location near the associated scoop tube lock pushbuttons.	X						
I 74	B	Monticello will add a guard rail along the main control panels to prevent accidental activation of controls. In addition the buttons will be moved back, with the exception of the annunciator buttons, which will be demarcated to enhance their special requirements.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 75	6.6.3.3(b)		Off-gas system equipment labels are inconsistent (both 1004 A/B and 11/12).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 75	252A			M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 75		The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 76	6.4.1.1(c)		Pushbuttons must be pressed for 45 sec to check valve strokes. This is fatiguing.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 76	3	16A-S3A	STEAM ISOLATION VALVE 2-80A	M	M	H	H	4	
I 76	3	16A-S3B	STEAM ISOLATION VALVE 2-80B	M	M	H	H	4	
I 76	3	16A-S3C	STEAM ISOLATION VALVE 2-80C	M	M	H	H	4	
I 76	3	16A-S3D	STEAM ISOLATION VALVE 2-80D	M	M	H	H	4	
I 76	3	16A-S4A	STEAM ISOLATION VALVE 2-86 A	M	M	H	H	4	
I 76	3	16A-S4B	STEAM ISOLATION VALVE 2-86B	M	M	H	H	4	
I 76	3	16A-S4C	STEAM ISOLATION VALVE 2-86C	M	M	H	H	4	
I 76	3	16A-S4D	STEAM ISOLATION VALVE 2-86D	M	M	H	H	4	
I 76	7	20 CVT-PB	MAIN CONTROL VALVES	M	M	L	L	4	
I 76	7	BVT-PB	BYPASS VALVES	M	M	M	L	4	
I 76	7	ISVT	INTERMEDIATE STOP VALVES TEST	M	M	L	L	4	
I 76	7	IVT-PB	INTERCEPT VALVES	M	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 76		Monticello will not take any corrective action. The design of these switches is a compromise of a "dead man" function that resets on accidental release and the need to hold down the switch for extended periods. Monticello prefers to maintain the failsafe operation of the system. Moreover, they are used infrequently.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 77	6.4.1.1(a)	PRESS REG OVERRIDE	Pressure-regulator override has too much lag and a large deadband.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 77	7	PRO	PRESS REG OVERRIDE	M	H	H	M	2	
I 77	7	SVT-PB	MAIN STOP VALVES	M	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 77	A	The Pressure Regulator Override (PRO) is an override of the main turbine Electric or Mechanical Pressure Regulators. The output signal of the PRO is always set at a minimum output. The difference between the PRO and the EPR or MPR output signal is the function of reactor power level. The higher the reactor power level, the greater the difference between these signals. To place the PRO into control, this differnece has to be overcome. This is the reason for the apparent slow response of this device. No corrective actions are planned.					X		
I 77	B	The response time of the Main Stop Valve Pushbutton is adjusted to prevent upset in the turbine oil system during stop valve testing. No corrective actions are planned.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 78	6.4.1.1(c)		Scoop tube could be reset from CR if mistaken for annunciator reset button.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 78	4	2A-S2A	SCOOP TUBE A POWER	M	H	L	M	3	
I 78	4	2A-S2B	SCOOP TUBE B POWER	M	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 78		Monticello will relocate the scoop tube reset pushbuttons to eliminate this potential problem.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 79	6.4.4.3(a)		Key-operated switches should not be used to protect against accidental activation, only for protecting against unauthorized action

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 79			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 79		No changes are planned for these controls. The keylocked switches are used where it has been determined to be important to control the position of a switch to ensure the desired function of a component or system.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 80	6.4.4.2(b)	EFT	EFT switches are difficult to get in and out of pull-to-lock. Large torque forces and sharp edges result in difficult operation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 80	263A	HS-9000A	EFT SYSTEM MASTER SW	M	M	M	H	4	
I 80	263A	V-EAC-14A	OUTSIDE AIR VD-9051B	M	M	M	H	4	
I 80	263A	V-EAC-14B	AIR CONDIT CONTROL	M	M	M	H	4	
I 80	263A	V-ERF-11 (CONTROL)	FILTER TRN FAN CONTROL	M	M	H	H	4	
I 80	263A	V-ERF-14A	EXHAUST ISOL VD-9213B	M	M	M	H	4	
I 80	264B	HS-9000B	EFT SYSTEM MASTER SW	M	M	M	H	4	
I 80	264B	V-EAC-14A	AIR CONDIT CONTROL	M	M	M	H	4	
I 80	264B	V-EAC-14B	OUTSIDE AIR VD 9051A	M	M	M	H	4	
I 80	264B	V-ERF-12 (CONTROL)	RETURN AIR CONTROL	M	M	H	H	4	
I 80	264B	V-ERF-14B	RETURN AIR CONTROL	M	M	M	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 80		Monticello will review an option of installing a modified handle on these switches to improve the leverage on switch activation. The alternative that will be reviewed is to open up the switches and work on the springs that are causing the problem.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 81	6.1.1.3(a)		Operators do not have full view of all alarms in the primary operating area. Some alarms are on back panels or behind main boards.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 81			--	M	L	-	-	4	
I 81			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 81		Based on the multiple problems identified during the CRDR review, a complete redesign of the Monticello alarm system is planned. The problems will be resolved during that redesign.		X					

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 82	6.3.1.2(c)		Annunciator should not have inputs from more than one plant parameter setpoint (common alarm for intake/discharge).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 82			--	M	H	-	-	2	
I 82			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 82		Monticello will consider splitting these into separate alarms. Monticello plans to balance the need to reduce the number of CR alarms with the requirement to separate the multi input alarms.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 83	6.3.3.4(b)		Common trouble alm for the off-gas sys requires oper. to go outside the primary operating area to check more detailed annun panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 83	7	C07-A-20	OFF GAS ANNUNCIATOR	M	H	M	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 83		An overall review of these panels is in progress. It is Monticello's belief that adequate staffing is provided to respond to these panels without significantly impacting the operator responses to other control room panels.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 84	6.3.1.4(a)		Annun sys has many incidental alms during a major transient. This results in an information overload in these conditions.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 84			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 84		Monticello will review the possibility of alarm filtering and improved alarm organization in an overall alarm system review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 85	6.3.2.1(a)	DIESEL FIRE PUMP	Emergency diesel fire pump running (indicating light) does not sound the auditory alarm.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 85	20	C20-A-20	M-G SET ROOM VENT V-SF-3 NO FLOW	M	H	M	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 85		An alarm will be added to alert the control room operator to this condition.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 86	6.1.1.1(a)		RHR SW pump trip/DL alarms are mounted inside the panel. Recombiner, water intake and demin. seal water alms not readily access.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 86			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 86		RHR SW Pump alarms: These will be relocated to panel C03. Alarms associated with all plant auxiliary systems cannot be located on the main control room panels. During the alarm system review the need to provide additional annunciators for the circulating water, off-gas, seal water, and demin systems will be evaluated. No additional corrective action is planned.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 87	6.3.1.2(a)		Off-gas/recombiner and area radiation monitors generate many nuisance alarms.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 87	4	C04-A-01	REFUELING FL AREA HI RADIATION	M	L	M	H	4	
I 87	4	C04-A-06	NEW FUEL STORAGE AREA HI RADIATI	M	L	M	L	5	
I 87	4	C04-A-11	REACTOR BUILDING HI RADIATION	M	L	M	L	5	
I 87	4	C04-A-16	CR LAB SHOP HI RADIATION	M	L	M	L	5	
I 87	4	C04-A-21	TURBINE BUILDING HI RADIATION	M	L	M	L	5	
I 87	4	C04-A-26	RADWASTE BUILDING HI RADIATION	M	L	M	L	5	
I 87	4	C04-A-31	AREA MONITOR DOWNSCALE	M	L	M	L	5	
I 87	7	C07-A-20	OFF GAS ANNUNCIATOR	M	L	M	M	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 87		Monticello will review the setpoints of these radiation monitors. The set points of monitors generating nuisance alarms will be adjusted if possible to eliminate these problems.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 88	6.3.3.4(a),d		Some alarm messages are unnecessarily abbreviated, and infrequent alarms are hard to identify.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 88			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 88		Monticello will correct this problem as part of the alarm system review. The present standard abbreviation list will be applied to the problem. A review of the alarm procedures will be made to determine if upgrading of these procedures is warranted to correct problems with locating alarms.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 89	6.3.3.2(b)		Alarm flash rate (slow flash) may be too slow for clear recognition.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 89			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 89		This was not supported in the review. No change is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 91	6.3.1.2(b)		Common alarm for subyard requires auxiliary operator to leave CR and should be avoided.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 91			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 91		Monticello will consider these problems as part of their overall alarm system review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 93	6.6.3.3(a)		Part-system nos. for M-G oil pumps (11, 12, A1, A2) are not consistently applied.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 93	4	2A-S3A	CIRC LUBE OIL PUMP A1 CONTROL	M	M	L	M	4	
I 93	4	2A-S3B	CIRC LUBE OIL PUMP B1 CONTROL	M	M	L	M	4	
I 93	4	2A-S4A	CIRC LUBE OIL PUMP A2 CONTROL	M	M	L	M	4	
I 93	4	2A-S4B	CIRC LUBE OIL PUMP B2 CONTROL	M	M	L	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 93		Monticello will develop a list of synonyms to establish the correct terminology that will be used for each piece of equipment or each plant function. This will be added to the Monticello Control Room Convention Specifications, along with the abbreviations.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 97	6.7.2.7(a)		Highlighting is not used on the SOE printout to attract the operator's attention to important data.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 97			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 97		Monticello considers the SOE printout to have only high priority points. Alarm points are printed in red when the point is in alarm. No corrective actions are planned.					X		

E-255

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 98	6.1.1.2(a)		Two operators are insufficient to complete control room tasks. Plant operator manning should be enhanced.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 98			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 98		Additional operators are provided for all planned, startup and shutdown evolutions. Other planned evolutions such as tests are reviewed for many things including adequate operator staffing.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I 99	6.2.1.1(b)		System is not effective when contacting people in high noise areas in the plant, i.e., DG, pumps, and recirculation M-G room.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I 99			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I 99		Monticello will ensure that administrative controls (surveillance testing) are available for adjusting the plant PA system to ensure that they can be heard in all of the controlled area.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I100	6.1.1.3(b)		Communication equipment is not readily available at the APRM panel area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I100	37			M	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I100		Additional communication equipment will be provided for operator use in this area.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I101	6.1.4.1(b)		Face masks prevent operators from wearing glasses and impair vision by fogging.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I101			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I101		Monticello has taken several steps to solve this problem. Operators are issued special insert glasses for use with the face masks. Also, a new control room ventilation system (Emergency Filtration Train or EFT) has eliminated or greatly reduced the possibility of CR operators needing to wear a face mask.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I102	6.2.1.8(c)		Voice communication is very difficult when wearing protective gear.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I102			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I102		The new EFT ventilation system greatly reduces the likelihood of wearing this equipment. The protective equipment provided for workers is as good as any equipment that Monticello is aware of. Many different kinds/designs of communication equipment for use with this protective gear have been evaluated. None has been found to be totally acceptable by all workers. Monticello will continue to evaluate this equipment.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I103	6.4.1.2(d)		Breaker interlock can be defeated by brute force.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I103			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I103		Monticello engineering has informed the review team that this is not possible within the control room. It may be a problem outside the control room, but this is outside the scope of the review.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
I104	6.9.1.1(a)		Main steam line test is not located with associated display.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
I104	3	16A-S3A	STEAM ISOLATION VALVE 2-80A	M	M	H	H	4	
I104	3	16A-S3B	STEAM ISOLATION VALVE 2-80B	M	M	H	H	4	
I104	3	16A-S3C	STEAM ISOLATION VALVE 2-80C	M	M	H	H	4	
I104	3	16A-S3D	STEAM ISOLATION VALVE 2-80D	M	M	H	H	4	
I104	3	16A-S4A	STEAM ISOLATION VALVE 2-86 A	M	M	H	H	4	
I104	3	16A-S4B	STEAM ISOLATION VALVE 2-86B	M	M	H	H	4	
I104	3	16A-S4C	STEAM ISOLATION VALVE 2-86C	M	M	H	H	4	
I104	3	16A-S4D	STEAM ISOLATION VALVE 2-86D	M	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
I104		Monticello will move the Main Steam Line Flow indicator near the Main Steam Line controls.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 2	6.1.1.3(f)(1)		Equipment-to-opposing-surface-distance should be 50" or greater. Between panel and back wall is too narrow at 44 3/4".

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVEMT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 2	292			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 2		This HED lists the panels that are placed in narrow aisles. No corrective action is planned. No problems associated with maintenance or operations activities have been reported.					X		

E-263

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 8	6.1.1.1(a)		The control room should have sufficient instrumentation. No indication of DRYWELL PRESSURE.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 8	292			L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 8		The necessity for drywell pressure indication is outside of the design scope of the ASDS control panel. There is no need for this parameter because the operator is not required to control drywell pressure. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 9	6.1.2.6		The procedure and reference manuals are not stored at the ASDS panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 9	292			L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 9		This has been corrected through the installation of a cabinet for equipment and procedures near the ASDS panel.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 10	6.1.5.3(a)		The recommended light level is 30 ft-C with a minimum of 20 ft-C. The vertical panel is too dark (13 ft-C).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 10	292			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 10		Monticello will enhance the lighting for the ASDS panel.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 11	6.1.5.3(e)(1)		Ambient or diffuse lighting should be provided. Direct overhead lighting produces shadows on vertical panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 11	292			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 11		Monticello will enhance the lighting for the ASDS panel.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 12	6.1.5.3(e)(2)		The direct overhead lighting should not produce a shadow that falls on the labels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 12	292			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 12		Monticello will enhance the lighting for the ASDS panel.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 13	6.3.1.2(c)(1)	ALARM	Annunciators should have only one plant parameter input. Visual alarm indicates two problems: "DAY TANK LEVEL/FLOW LOW."

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 13	292	NP-1	ANNUNCIATOR PANEL	L	M	H	M	4	

RESOLUTIOH DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 13		This problem will be covered in the overall alarm system review.							X

HUMAH ENSINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 14	6.3.1.2(c)(2)		Where multi-input annunciators must be used, an alarm printout capability should be provided.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 14	292			L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGH	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 14		This problem will be covered in the overall alarm system review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 16	6.3.3.3(c)	ALARM	The coordinates for visual alarms are not present. Individual alarm tiles should be identified by a code number.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 16	292	NP-1	ANNUNCIATOR PANEL	L	L	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 16		This prohlem will be resolved by identifying these windows per the Monticello Convention Specification for identifying alarm window coordinates.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 17	6.3.3.3(e)	ALARM	An out-of-service alarm should give a cue.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 17	292	NP-1	ANNUNCIATOR PANEL	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 17		Monticello administratively controls out-of-service alarms through the use of tags.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 21	6.5.4.1(b)	RECORDER	The recorder scales and the recording paper scales should match.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 21	292	NP-7	REACTOR PRESSURE/LEVEL RECORDER	L	H	H	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGH	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 21		All recorders are provided with internal labels identifying the correct chart paper. Operators are instructed to install the appropriate recorder paper when replacement is necesary. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 39	6.2.1.2(a)(5)		Phone cords should be positioned to avoid entangling critical controls or endangering passing traffic. Cord crosses doorway.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 39	292			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 39		There is a phone on the side of the ASDS panel which allows the operator full access to Monticello communication services. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 41		ASDS panel	No information is presented to the operator for them to determine the current state of the system.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 41	292			L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 41		A procedure exists to line up control switches for the ASDS panel prior to the transfer of control. The HED has been corrected by the placement of a cabinet for equipment and procedures near the ASDS panel.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
R 42	6.1.2.6		Provisions should be made so that the reference materials needed can be consulted easily. No laydown space is available at ASDS.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
R 42	292			L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
R 42		Monticello will provide a device to support procedures at the panel.		X					

HUHAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 1	6.1.1.3(a)	--	Bookshelves obstruct view of rear panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 1				M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 1		Redesign of the control room operator workstation has resolved this problem. Remaining minor obstructions are not considered a significant problem.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 2	6.1.1.3(f)	--	Unguarded openings in front of panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 2	252A			L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 2		The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 3	6.1.1.5(f)	--	Records of status of expendables and spare parts are not kept.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 3			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 3		This problem has been resolved by increasing chart paper inventory and transferring the responsibility for ordering these supplies. Inventories are computer monitored and ordered.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 4	6.1.2.2(d)	--	Standup console controls are beyond reach of small female (5%). Controls should be no more than 25" from edge of benchboard.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 4			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 4		Monticello has evaluated this problem. In actual tests, it was found that no benchboard control was beyond the reach of a 5' tall woman.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 5	6.1.2.2(c)	--	Upper benchboard controls beyond reach of small female (5%). Benchboard depth put controls outside the reach of a small woman.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 5			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 5		Monticello has performed a survey with a 5' tall woman to determine actual reach capabilities on the existing control panels. Four instruments were found to be just outside of her actual reach capability. One instrument was found to be obviously outside of her reach capability. These devices are within the reach capability of all present control room operators. It is very unlikely for anytime in the future that all control room operators on one shift would fall in the female 5% category. Monticello does not plan to move these instruments.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 6	6.1.2.2(d)	J-HANDLES	Some J-Handles set back less than three inches from front edge and are vulnerable to accidental activation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 6	3	14A-S4A	C.S. A TEST MO 1749	L	M	H	M	4	
S 6	3	14A-S4B	C S B TEST MO 1750	L	M	H	M	4	
S 6	3	16A-S10	RHR SHUTDOWN ISOL MO 2030	L	M	H	M	4	
S 6	3	16A-S11	RX HD. COOL ISOL MO 2027	L	M	H	M	4	
S 6	3	16A-S12	RX HD COOL ISOL MO 2026	L	M	H	M	4	
S 6	3	16A-S13	RHR TO W.S.T-23 MO 2032	L	M	H	M	4	
S 6	3	16A-S14	RHR TO WS T-23 MO 2407	L	M	H	M	4	
S 6	3	16A-S1D	STEAM ISOLATION VALVE 2-80D	L	M	M	H	4	
S 6	3	16A-S2D	STEAM ISOLATION VALVE 2-86D	L	M	H	H	4	
S 6	3	16A-S36	STEAM LINE DRAIN VALVE 2-79	L	M	L	L	4	
S 6	3	16A-S9	RHR S.D. CLG I.B. ISOL MO 2029	L	M	H	H	4	
S 6	4	HS-3502	MO 3502 RCIC TEST RET	L	M	L	L	4	
S 6	7	BPHM	#2 SV BYPASS BYPASS HANDWHEEL	L	M	M	M	4	
S 6	8	190-D81/CS	NO.11 DIESEL GEN VOLT ADJUST	L	M	H	M	4	
S 6	8	190-DG2/CS	NO.12 DIESEL GEN VOLT ADJUST	L	M	H	M	4	
S 6	8	290	REGULATOR VOLTAGE ADJUST	L	M	L	M	4	
S 6	8	GSC1/CS	NO.11 DIESEL GEN SPEED ADJUST	L	M	H	M	4	
S 6	8	GSC2/CS	NO.12 DIESEL GEN SPEED ADJUST	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 6		Monticello will install a guard rail along the edge to prevent accidental activation. Monticello will also evaluate the possible problems this will create for the distance that one must reach across to get to the upper benchboard and vertical panel.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 7	6.1.2.5(a)	--	Controls are located outside an area between 34" and 70" above the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 7	20	42-3208/CS	HEAT EXCH AREA FAN V-AC-9	M	L	L	L	5	
S 7	20	42-4306/CS	NORTHEAST EQUIP RM FAN V-AC-6	M	L	L	L	5	
S 7	25	8033A1	DAMPER ADJUST CONTROL	M	L	M	M	5	
S 7	25	8033C3	DAMPER ADJUST CONTROL	M	L	M	M	5	
S 7	25	8033D4	DAMPER ADJUST CONTROL	M	L	M	M	5	
S 7	25	HS 1428	COOLING WATER	M	M	H	M	4	
S 7	25	HS 1429	COOLING WATER	M	M	H	M	4	
S 7	25	HS 1430	COOLING WATER	M	M	H	M	4	
S 7	25	PB-PIL-8031A	ALARM ACK	M	M	H	M	4	
S 7	25	PB-PIL-8031B	ALARM ACK	M	M	H	M	4	
S 7	25	PB-PIL-8031C	ALARM ACK	M	M	H	M	4	
S 7	25	PB-PIL-8031D	ALARM ACK	M	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 7		These components are infrequently used (Ventilation of Primary Containment and Rx Bldg), and no relocation of these components is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 8	6.1.2.5(b)	DISPLAYS	Displays are located outside an area between 41" and 70" above the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 8	20	(V-FU-3A)	SAMPLE HOOD EXH FAN	M	L	L	L	5	
S 8	20	(V-FU-3B)	SAMPLE HOOD EXH FAN	M	L	L	L	5	
S 8	20	(V-MZ-1)	SWITCH GEAR AREA FAN	M	L	L	L	5	
S 8	20	(V-MZ-4)	TURB BLDG SUPPLY FAN	M	L	L	L	5	
S 8	20	(V-MZ-5)	COND AREA SUPPLY AIR	M	L	L	L	5	
S 8	20	(V-MZ-6)	TURB BLDG SUPPLY AIR	M	L	L	L	5	
S 8	25	8033A	FAN INLET DAMP POSITION	M	L	H	M	4	
S 8	25	8033B	FAN INLET DAMPER POSITION	M	L	H	M	4	
S 8	25	8033C	FAN INLET DAMP POSITION	M	L	H	M	4	
S 8	25	8033D	FAN INLET DAMP POS	M	L	H	M	4	
S 8	25	8045A	LOW FLOW	M	L	H	M	4	
S 8	25	8045B	LOW FLOW	M	L	H	M	4	
S 8	25	8045C	LOW FLOW	M	L	H	M	4	
S 8	25	8045D	LOW FLOW	M	L	H	M	4	
S 8	25	8045E	HIGH FLOW	M	L	H	M	4	
S 8	25	8045G	HIGH FLOW	M	L	H	M	4	
S 8	25	8045H	HIGH FLOW	M	L	H	M	4	
S 8	25	HS 1427	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1427	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1428	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1428	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1429	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1429	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1430	COOLING WATER	M	L	H	M	4	
S 8	25	HS 1430	COOLING WATER	M	L	H	M	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 8	25	TR 1720	DRYWELL COOLER TEMP RECORDER	M	L	H	M	4	
S 8	26	FI 3284	N2 PURGE FLOW	M	L	M	M	5	
S 8	26	PI 3283	N2 PURGE PRESSURE	M	L	M	L	5	
S 8	257	RR 7858A	STACK NOBLE GAS	M	L	H	H	4	
S 8	258	RR 7858C	STACK NOBLE GAS	M	L	H	H	4	
S 8	259	RR 7859A	RBV NOBLE GAS	M	L	H	H	4	
S 8	260	AR 4018B	O2/H2 CONCENTRATION CH B	M	L	M	M	5	
S 8	260	RR 7858B	STACK NOBLE GAS	M	L	H	H	4	
S 8	260	RR 7858D	STACK NOBLE GAS	M	L	H	H	4	
S 8	260	RR 7859B	RBV NOBLE GAS	M	L	H	H	4	
S 8	260	RR 7859C	RBV NOBLE GAS	M	L	H	H	4	
S 8	260	RR 7859D	RBV NOBLE GAS	M	L	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 8		No relocation is planned: No good alternative location and operations staff has not had problems seeing these devices or reading these labels.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 9	6.1.5.2(a)	--	Air velocities in primary operating area produce a noticeable draft.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 9			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 9		Monticello will review the operation of this equipment and redesign the ventilation diffusers if this can reduce the drafts in the CR.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 10	6.1.5.7(a)(2)	--	Colors in control room are drab and plain.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 10			--	M	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 10		Monticello plans to repaint the CR with neutral and more attractive colors.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 11	6.1.5.7(a)(3)	--	Folding chairs and simple office chairs do not provide comfortable seating.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 11			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 11		The redesign of the control room operator's work station included replacing chairs with ergonomically designed replacements.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 12	6.1.5.7(a)(5)	--	No carpet in control room to lessen fatigue of standing and walking.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 12			--	M	L	-	--	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 12		Carpeting has been added to the CR.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 13	6.2.1.2(c)(2)	--	Control room does not have automatic priority of access to switching system within the plant.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 13			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 13		This is not a problem at Monticello because a radio page system is used to contact operators.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 14	6.2.1.6(a)(2)	ANNOUNCING SYSTEM	Loudspeakers are too low on the turbine and refuel floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 14			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 14		Monticello will review administrative procedures to check that outplant areas have good communications with the control room.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 15	6.2.1.6(e)(1)	LOUDSPEAKERS	Speaker volume is not adjustable.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 15			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 15		Speaker volume is adjustable. Volume will be checked and administrative procedures will be developed to maintain sufficient volume.				X			

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 16	6.2.1.8(b)	EMGCY COMMUNICATIONS	Communications equipment is not usable by personnel wearing protective gear.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 16			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 16		The new EFT ventilation system greatly reduces the likelihood of wearing this equipment. The protective equipment provided for workers is as good as any equipment that Monticello is aware of. Many different kinds/designs of communication equipment for use with this protective gear have been evaluated. None has been found to be totally acceptable by all workers. Monticello will continue to evaluate this equipment.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 17	6.2.1.8(c)(1)	--	Emergency face masks are not equipped with diaphragms that are designed to transmit speech.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 17			--	M	H	-	-	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 17		The new EFT ventilation system greatly reduces the likelihood of wearing this equipment. The protective equipment provided for workers is as good as any equipment that Monticello is aware of. Many different kinds/designs of communication equipment for use with this protective gear have been evaluated. None has been found to be totally acceptable by all workers. Monticello will continue to evaluate this equipment.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 18	6.3.1.2(a)(1)	--	Alarms occur too frequently. Prioritization, alarm filtering, or modification of setpoints should be considered.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 18	3			M	M	-	-	4	
S 18	3	C03-B-24	MAIN STEAM LINE CH A DOWNSCALE	M	M	M	L	4	
S 18	3	C03-B-40	MAIN STEAM LINE CH B DOWNSCALE	M	M	L	L	4	
S 18	4	C04-B-06	CLEAN UP DISCH HI/LO PRESS	M	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 18		Monticello has worked very hard to achieve a darkboard status for alarm panels. Nuisance alarms are reviewed and resolved on an individual basis. No additional corrective actions are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 19	6.3.1.2(b)	--	Alarms require control room operator to direct auxiliary operator to particular plant location for information.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 19	5	C05-A-49	RADWASTE TROUBLE	M	L	L	M	5	
S 19	6	C06-A-27	[BLANK]	M	L	L	H	4	
S 19	6	C06-A-35	COND DMIN SYSTEM TROUBLE	M	L	L	L	5	
S 19	6	C06-C-11	HTG BOILER S-1 TROUBLE	M	L	M	M	5	
S 19	6	C06-C-24	DISCHARGE STRUCT TROUBLE	M	L	L	L	5	
S 19	6	C06-C-25	COOLING TOWER FANS TROUBLE/FIRE	M	L	L	H	4	
S 19	6	C06-C-26	CW INTAKE SYSTEM TROUBLE	M	L	M	H	4	
S 19	7	C07-A-20	OFF GAS ANNUNCIATOR	M	L	M	M	5	
S 19	8	C08-A-03	345 KV & 115 KV YARD TROUBLE	M	L	M	M	5	
S 19	8	C08-B-05	NO 1R RES & NO 11 AUX TRANS PARA	M	L	M	M	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 19		Monticello will be reviewing changes in the entire alarm system, and this problem will be addressed during that review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 20	6.3.1.2(c)(1)	--	Annunciators have inputs from more than one plant-parameter setpoints.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 20	3	C03-A-03	RHR I/II DISCH SHTDN HEADERS ON	M	H	M	M	3	A
S 20	3	C03-A-07	HPCI STEAM LINE HI DIF PRESS	M	H	H	L	2	A
S 20	3	C03-B-16	MAIN STEAM LINE CH A HI RADIATIO	M	H	H	L	2	A
S 20	3	C03-B-32	MAIN STEAM LINE CH B HI RADIATIO	M	H	H	L	2	A
S 20	3	C03-B-56	HIGH AREA TEMP STEAM LEAK	M	H	H	L	2	A
S 20	4	C04-A-15	RCIC TURBINE EXHAUST DISCH HI PR	M	H	M	L	3	A
S 20	4	C04-A-19	VACUUM TANK PRESS HI	M	H	L	M	3	A
S 20	4	C04-A-35	VESSEL FLANGE SEAL LEAK	M	H	L	M	3	A
S 20	4	C04-B-04	SUPPRESSION WATER LEVEL HI/LOW	M	H	H	M	2	A
S 20	4	C04-B-06	CLEAN UP DISCH HI/LO PRESS	M	H	L	L	4	A
S 20	4	C04-B-07	T.B. NORM EST SUMP MONITOR HI/IN	M	H	M	L	3	A
S 20	4	C04-B-17	DRYWELL FLOOR DRAIN SUMP HI LEVE	M	H	M	L	3	A
S 20	4	C04-B-18	DRYWELL EQUIP DRAIN LEAK RATE CH	M	H	M	L	3	A
S 20	4	C04-B-22	DRYWELL CAM TROUBLE	M	H	L	L	4	A
S 20	4	C04-B-33	FUEL POOL COOLING SYSTEM TROUBLE	M	H	L	L	4	A
S 20	4	C04-C-30	RECIRC GEN/DRIVE MTR STATOR TEMP	M	H	L	M	3	A
S 20	4	C04-C-35	RECIRC PUMP MTR TEMP HI	M	H	L	M	3	A
S 20	5	C05-A-09	REACTOR VESSEL L/L WTR LEVEL CH	M	H	H	M	2	A
S 20	5	C05-A-10	REACTOR VESSEL L/L WTR LEVEL CH	M	H	H	M	2	A
S 20	5	C05-A-15	24 VDC SYSTEM A UNDER/OVER VOLTA	M	H	H	M	2	A
S 20	5	C05-A-23	24 VDC SYSTEM B UNDER/OVER VOLTA	M	H	H	M	2	A
S 20	5	C05-A-51	RBM HI/INOP	M	H	L	M	3	A
S 20	5	C05-B-15	STANDBY LIQUID HI/LO TEMP	M	H	H	M	2	A
S 20	5	C05-B-16	REACTOR PRESS HI/LO TEMP	M	H	M	M	3	A
S 20	5	C05-B-23	STANDBY LIQUID TANK HI/LHI/LEVEL	M	H	H	M	2	A

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 20	5	C05-B-24	REACTOR WATER LEVEL HI/LO	M	H	M	L	3	A
S 20	5	C05-B-27	MAIN STEAM LINE ISOL VLV SCRAM T	M	H	H	H	2	A
S 20	5	C05-B-45	DRYWELL HI/LO PRESS	M	H	M	L	3	A
S 20	6	C06-B-04	DMIN WTR STOR TK T2 HIGH-LOW LEV	M	H	L	L	4	A
S 20	6	C06-B-34	N2 SYSTEM TROUBLE	M	H	M	L	3	A
S 20	6	C06-C-01	DIESEL OIL STOR TK T-44 HI LOW L	M	H	M	M	3	A
S 20	6	C06-C-09	CIRC WTR PP P-100A TRIP	M	H	M	M	3	A
S 20	6	C06-C-10	CIRC WTR PP P-100B TRIP	M	H	M	M	3	A
S 20	6	C06-C-28	DISCH STRUCT H & V UNITS TROUBLE	M	H	L	H	2	A
S 20	7	C07-B-30	EPR OIL SYSTEM TROUBLE	M	H	M	M	3	A
S 20	8	C08-A-01	NO.1 GENERATOR LOCKOUT	M	H	H	H	2	A
S 20	8	C08-A-04	NO.11 INST AC BUS UNDERVOLTAGE	M	H	M	M	3	A
S 20	8	C08-A-06	NO.1 GENERATOR BREAKER 8N4 TRIP	M	H	M	M	3	A
S 20	8	C08-A-07	NO.1 GENERATOR BREAKER 8N5 TRIP	M	H	M	M	3	A
S 20	8	C08-A-09	NO.12 INST AC BUS UNDERVOLTAGE	M	H	M	M	3	A
S 20	8	C08-A-15	BATTERY CHGR SUPPLY UNDERVOLTAGE	M	H	H	M	2	A
S 20	8	C08-A-25	250V DC BUS GROUND	M	H	M	M	3	A
S 20	8	C08-B-06	NO.11 AUX TRANS TO NO.13 BUS BKR	M	H	M	M	3	A
S 20	8	C08-B-09	NO 11 AUX TRANS TO NO 11 BUS BKR	M	H	M	M	3	A
S 20	8	C08-B-10	NO 1R RES TRANS TO NO 11 BUS BKR	M	H	M	M	3	A
S 20	8	C08-B-13	NO.12 125V BUS LOW VOLTAGE	M	H	H	M	2	A
S 20	8	C08-B-17	NO.13 BUS TO NO.15 BUS BREAKER T	M	H	M	M	3	A
S 20	8	C08-B-21	NO.101 TRANS 4.15KV BKR TRIP	M	H	M	L	3	A
S 20	8	C08-B-22	NO.103 TRANS 4.15KV BKR TRIP	M	H	M	L	3	A
S 20	8	C08-B-26	NO.101 TRANS 480V BKR TRIP	M	H	M	L	3	A
S 20	8	C08-B-27	NO.103 TRANS 480V BKR TRIP	M	H	M	L	3	A
S 20	8	C08-C-01	1 AR TRANS TROUBLE	M	H	M	M	3	A
S 20	8	C08-C-04	NO.1R RES TRANS LOCKOUT	M	H	H	M	2	A
S 20	8	C08-C-05	NO.1R RES TRANS TROUBLE	M	H	M	M	3	A
S 20	8	C08-C-06	NO.1R RES TRANS TO NO.12 BUS BKR	M	H	M	M	3	A
S 20	8	C08-C-07	NO.11 AUX TRANS TO NO.12 BUS BKR	M	H	M	M	3	A
S 20	8	C08-C-08	NO.1AR RES TRANS TO NO.15 BUS BK	M	H	M	M	3	A
S 20	8	C08-C-09	NO.1R RES TRANS TO NO.14 BUS BKR	M	H	M	M	3	A
S 20	8	C08-C-10	NO.11 AUX TRANS TO NO.14 BUS BKR	M	H	M	M	3	A
S 20	8	C08-C-11	1AR TRANS TO 16 BUS BKR TRIP	M	H	M	M	3	A
S 20	8	C08-C-17	NO.16 416V BUS TO NO.15 BUS BKR	M	H	L	M	3	A
S 20	8	C08-C-19	NO.14 4160V BUS TO CO.16 BUS BKR	M	H	M	M	3	A

S 20 8	C08-C-24	NO.104 TRANS 4.16 KV BKR TRIP	M	H	M	M	3	A
S 20 8	C08-C-25	NO.102 TRANS 4.16 KV BKR TRIP	M	H	M	M	3	A
S 20 8	C08-C-29	NO.104 TRANS 480V BKR TRIP	M	H	M	M	3	A
S 20 8	C08-C-30	NO.102 TRANS 480V BKR TRIP	M	H	M	M	3	A
S 20 20	C20-A-09	REACTOR BLDG HVAC UNIT A TROUBLE	M	H	M	M	3	A
S 20 20	C20-A-13	SAMPLE HOOD EXH V-FU-3 TROUBLE	M	H	L	L	4	A
S 20 20	C20-A-16	REACTOR BLDG HVAC UNIT B TROUBLE	M	H	M	M	3	A
S 20 20	C20-A-23	FUEL POOL VENT UNIT A TROUBLE	M	H	M	M	3	A
S 20 20	C20-A-30	FUEL POOL VENT UNIT B TROUBLE	M	H	M	M	3	A
S 20 20	C20-A-34	DILUTION AIR FAN V-EF-18A TROUBL	M	H	H	H	2	A
S 20 20	C20-A-35	DILUTION AIR FAN V-EF-18B TROUBL	M	H	H	H	2	A
S 20 20	C20-A-37	RADWASTE HVAC TROUBLE	M	H	M	L	3	A
S 20 20	C20-A-36	CABLE SPREADING ROOM TROUBLE	M	H	M	H	2	A
S 20 24A	C24A-04	SBGT HIGH TEMP	M	H	H	M	2	A
S 20 24B	C24B-04	SBGT HIGH TEMP	M	H	H	M	2	A
S 20 259	C259-A-09	STACK EFFLUENT MONITOR INOP	M	H	H	H	2	A
S 20 259	C259-A-10	RBV EFFLUENT MONITOR INOP	M	H	H	H	2	A
S 20 259	C259-A-28	CONT ATMOSPHERE CH B HEATING TRB	M	H	M	M	3	A
S 20 252B	C252-A-02	STORAGE BLDG SUMP LEVEL HIGH LAH	M	H	L	L	4	B
S 20 252B	C252-A-50	TRAIN A OUTLET H2 SHUTDOWN AAH-7	M	H	L	H	2	B
S 20 252C	C252-B-03	NO EXHAUST AIR (RECOMBINER)	M	H	L	L	4	B
S 20 252C	C252-B-07	RADIATION MONITOR TRIP RAH-7572	M	H	M	L	3	B
S 20 252C	C252-B-50	TRAIN B OUTLET H2 SHUTDOWN AAH 7	M	H	L	H	2	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 20	A	The review of the Monticello alarm system will address these types of problems.							X
S 20	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 21	6.3.1.2(c)(3)	--	Subsequent alarms do not reactivate sound.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 21			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 21		Monticello will review and address this problem as part of an overall review of the annunciator system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 22	6.3.1.3(a)(1)	--	Separate first-out panel for reactor system is not provided.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 22			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 22		Monticello will evaluate this requirement in their alarm system review. The sequence of event log provides this capability.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 23	6.3.1.3(b)	--	Separate first-out panel is not provided for turbine-generator system.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 23			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 23		Monticello will review this requirement and how to best solve it in the alarm system review.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 24	6.3.1.5(a)	--	No distinct "clear" signal for cleared alarms.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 24			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 24		Monticello will check this HED and fix it as part of the alarm system redesign if necessary.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 25	6.3.2.1(a)	--	Auditory alarm signal is less than 10dB(A) above average ambient noise level.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 25			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 25		Alarm intensity will be adjusted to proper levels after the installation of carpeting, acoustical ceiling tile, and modifications to the heating and ventilation diffusers are completed.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 26	6.3.2.1(e)	--	Annunciator auditory alert only resets after lamp acknowledge. No automatic reset.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 26			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 26		Monticello will review this problem as part of the overall alarm system redesign.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 27	6.3.3.1(a)	--	Visual alarm panels are not located above related controls and displays.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 27			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 27		This will require moving windows to the associated system/equipment location. Monticello will resolve this problem as part of the alarm system redesign.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 28	6.3.3.1(b)	--	Panels are not identified by label above panel.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 28			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 28		Panel labels will be provided as specified in the control room convention specification.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 29	6.3.3.3(a)	--	Visual alarms are individually numbered--not organized as matrix.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 29			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 29		No change is planned to the numbering system for the alarm panels. The procedures are keyed to these numbers, and operators are satisfied with this arrangement.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 30	6.3.3.3(b)	--	Visual alarm tiles not grouped by function.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 30			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 30		Annunciator windows will be grouped by system or function as appropriate during the alarm system review.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 31	6.3.3.3(c)(2-3	--	No coordinate designation on left and top sides of annunciator panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 31			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 31		The present numbering system has proved satisfactory and matches the alarm response procedure. No changes are planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 32	6.3.3.3(d)(2)	--	Tiles within annunciator panel matrix are not grouped by subsystem, function or other logical organization.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 32			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 32		Alarm tile grouping will be reviewed during the alarm system review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 40	6.3.4.1(a)(1)	--	Controls on C06, C07, and C08 do not have full capability for silencing auditory alert.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 40			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 40		Monticello will review and address this problem as part of an overall review of the annunciator system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 41	6.3.4.1(b)(2)	--	Alarm acknowledge is possible at points other than just workstation where alarm originated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 41			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 41		Monticello will review and address this problem as part of an overall review of the annunciator system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 42	6.3.4.1(c)(3)	--	Reset control is effective from points other than workstation where alarm originated.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 42			--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 42		Monticello will review and address this problem as part of an overall review of the annunciator system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 43	6.3.4.2(a)	--	Repetitive groups of annunciator controls do not have same arrangement and relative location at different panels.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 43	8			M	M	-	-	4	A
S 43	252A			M	M	-	-	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 43	A	This problem requires reorganizing the alarm control groups, taking care to organize consistently from one panel to the next. Monticello will accomplish this as part of an general alarm system redesign.		X					
S 43	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 44	6.3.4.2(b)(1-4	--	Annunciator response controls are not color coded or shape coded.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 44			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 44		Monticello will review and address this problem as part of an overall review of the annunciator system.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 45	6.2.2.6(a)	--	Less than 10dB(A) auditory signal-to-noise ratio at C05 and C13.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 45			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 45		Monticello will evaluate/correct this problem after the installation of carpeting, acoustical ceiling, and heating and ventilation modifications which have been done to reduce control room background noise.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 46	6.2.2.7(c)	--	No test capabilities for auditory signal system.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 46			--	L	H	-	-	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 46		Monticello will add auditory test capabilities to the alarm systems where this capability does not exist.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 47	6.1.5.3(b)	-	Illumination at C20 and C05 is too low.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 47	5			L	L	-	-	4	
S 47	20		--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 47		Monticello will review the need for additional lighting fixtures in these locations after the installation of carpeting, ceiling tiles, and painting of the control room is completed.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 48	6.1.5.3(a)	--	Horizontal surfaces of all main control panels are too bright.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 48			--	L	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 48		Monticello will evaluate the CR lighting after the installation of carpeting,and painting of the control room walls. If lighting levels are still high, corrective measures will be taken.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 49	6.1.5.5(b)	--	Background noise levels near panel C17 exceed 65 dB(A).

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCOM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 49	17		--	L	L	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 49		The problem of noise in this area will be re-evaluated after the addition of carpeting. Monticello will install acoustical ceiling tile where possible to reduce noise levels. Monticello will consider installing acoustical absorbent material on the concrete wall near the area, if it is necessary to do so.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 50	6.4.2.2(b)	--	Controls are not located according to function and should be grouped near related controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 50	5	FC 2-184-14	MASTER RECIRC FLOW CONTROL	L	M	L	L	4	A
S 50	5	S4A	ATWS A RESET	L	M	H	L	4	B
S 50	5	S5A	ATWS A MAN	L	M	H	M	4	B
S 50	5	S5C	ATWS C MAN	L	M	H	M	4	B
S 50	7	52-110 CS	ACB 52-110 MCC 115/116	L	M	M	M	4	C
S 50	7	52-206 CS	ACB 52-206 MCC 124/125	L	M	M	M	4	C
S 50	252D	HS-7682	RECOMBINER STEAM SUPPLY	L	M	M	L	4	D
S 50	252D	HS-7685	VAC BREAKER & AIR PURGE	L	M	L	L	4	D

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NC CORRECT	ALREADY FIXED	PENDING
S 50	A	Monticello will relocate this component to panel C04 near the associated equipment.	X						
S 50	B	These components must be separated to maintain divisional separation. No correction is planned.					X		
S 50	C	These components will be relocated near the associated equipment on panel C08.	X						

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 50	D	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 51	6.4.3.1(a)	--	Pushbuttons should be located in an order related to function or activation sequence.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 51	3	2E-S5A	--	L	M	M	L	4	
S 51	3	2E-S5A	--	L	M	M	L	4	
S 51	3	2E-S5B	--	L	M	M	L	4	
S 51	3	2E-S5B	--	L	M	M	L	4	
S 51	3	2E-S5C	--	L	M	M	L	4	
S 51	3	2E-S5C	--	L	M	M	L	4	
S 51	3	2E-S5D	--	L	M	M	L	4	
S 51	3	2E-S5D	--	L	M	M	L	4	
S 51	3	2E-S5E	--	L	M	M	L	4	
S 51	3	2E-S5F	--	L	M	M	L	4	
S 51	3	2E-S5G	--	L	M	M	L	4	
S 51	3	2E-S5H	--	L	M	M	L	4	
S 51	3	2E-S6A	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6B	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6C	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6D	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6E	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6F	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6G	VALVE TEST	L	M	M	L	4	
S 51	3	2E-S6H	VALVE TEST	L	M	M	L	4	
S 51	5	S4A	ATWS A RESET	L	M	M	L	4	
S 51	5	S4B	ATWS B RESET	L	M	M	L	4	

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 51		Monticello will rearrange these switches into clearer functional arrangements.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 52	6.8.2.2	--	Arrangement of components does not follow an alphabetic or numerical sequence.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 52	3	10A-S20A	11 RHRSW PUMP	L	M	H	M	4	A
S 52	3	10A-S20B	#12 RHRSW PUMP	L	M	H	M	4	A
S 52	3	10A-S21A	#13 RHRSW PUMP	L	M	H	M	4	A
S 52	3	10A-S21B	14 RHRSW PUMP	L	M	H	M	4	A
S 52	3	10A-S22A	#11 EMERGENCY S.W. PUMP	L	M	H	M	4	A
S 52	3	10A-S22B	12 EMERGENCY S W PUMP	L	M	H	M	4	A
S 52	3	HS-4025A	13 EMERGENCY SW PUMP	L	M	H	L	4	A
S 52	3	HS-4025B	14 EMERGENCY SW PUMP	L	M	H	L	4	A
S 52	7	PI 1830	MOIST SEP T-5C OUTLET	L	M	L	L	4	A
S 52	7	PI 1831	MOIST SEP T-5D OUTLET	L	M	L	L	4	A
S 52	7	PI 1832	INTERCEPT VALVE 1 OUTLET	L	M	L	L	4	A
S 52	7	PI 1833	INTERCEPT VALVE 2 OUTLET	L	M	L	L	4	A
S 52	8	A2-10	104 LOAD CENTER	L	M	H	M	4	A
S 52	8	A2-11	102 LOAD CENTER	L	M	H	M	4	A
S 52	8	A2-12	106 & 108 LOAD CENTER	L	M	H	M	4	A
S 52	8	A2-2	105 & 107 LOAD CENTER	L	M	H	M	4	A
S 52	8	A2-3	101 LOAD CENTER	L	M	H	M	4	A
S 52	8	A2-4	103 LOAD CENTER	L	M	H	M	4	A
S 52	5	S4A	ATWS A RESET	L	M	H	L	4	B
S 52	5	S4B	ATWS B RESET	L	M	H	L	4	B
S 52	5	S5A	ATWS A MAN	L	M	H	M	4	B
S 52	5	S5B	ATWS B MAN	L	M	H	M	4	B
S 52	5	S5C	ATWS C MAN	L	M	H	M	4	B
S 52	5	S5D	ATWS D MAN	L	M	H	M	4	B
S 52	5	TRR-3	COMPUTER TREND	L	M	L	L	4	C

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 52	5	TRR-4	COMPUTER TREND	L	M	L	L	4	C
S 52	6	DPI 1798	COND E-1A DIFF EAST	L	M	M	M	4	D
S 52	6	DPI 1799	COND E-1A DIFF WEST	L	M	M	M	4	D
S 52	6	DPI 1800	COND E-1B DIFF EAST	L	M	M	M	4	D
S 52	6	DPI 1801	COND E-1B DIFF WEST	L	M	M	M	4	D
S 52	6	HS-1012	HTR E11-A DUMP VALVE	L	M	L	L	4	D
S 52	6	HS-1051	HTR E11-B DUMP VALVE	L	M	L	L	4	D
S 52	6	M476-141A	MO 1133 - B 1207 AFW CV BLOCK VL	L	M	M	L	4	D
S 52	6	M476-141B	MO 1133 - B 1207 AFW CV BLOCK VL	L	M	M	L	4	D
S 52	6	M476-142A	MO 1134 - B 1231 BFW CV BLOCK VL	L	M	M	L	4	D
S 52	6	M476-142B	MO 1134 - B 1231 BFW CV BLOCK VL	L	M	M	L	4	D
S 52	6	M476-143A	FW LINE B MANUAL VALVE	L	M	M	L	4	D
S 52	6	M476-143B	FW LINE B MANUAL VALVE	L	M	M	L	4	D
S 52	6	M476-144A	FW LINE A MANUAL VALVE	L	M	M	L	4	D
S 52	6	M476-144B	FW LINE A MANUAL VALVE	L	M	M	L	4	D
S 52	6	M476-239A	CONDENSER E-1B CIRCULATING WATER	L	M	M	L	4	D
S 52	6	M476-239B	CONDENSER E-1B CIRCULATING WATER	L	M	M	L	4	D
S 52	6	M476-240A	CONDENSER E-1B CIRCULATING WATER	L	M	M	L	4	D
S 52	6	M476-240B	CONDENSER E-1B CIRCULATING WATER	L	M	M	L	4	D
S 52	7	M478-151A	M-S DRN TK T-6B DUMP VA POSITION	L	M	M	M	4	D
S 52	7	M478-151B	M-S DRN TK T-6B DUMP VA POSITION	L	M	M	M	4	D
S 52	7	M478-152A	MS DRN TANK C DUMP VA CV1003	L	M	M	M	4	D
S 52	7	M478-152B	MS DRN TANK C DUMP VA CV1003	L	M	M	M	4	D
S 52	7	M478-158A	M-S DRN TK T-6A DUMP VA POSITION	L	M	M	M	4	D
S 52	7	M478-158B	M-S DRN TK T-6A DUMP VA POSITION	L	M	M	M	4	D
S 52	7	M478-159A	MS DRN TANK D DUMP VA CV3132	L	M	M	M	4	D
S 52	7	M478-159B	MS DRN TANK D DUMP VA CV3132	L	M	M	M	4	D
S 52	20	LC 1013	HEATER E-12A DRAINS	L	M	M	H	4	D
S 52	20	LC 1014	HEATER E-12A DUMP	L	M	M	H	4	D
S 52	20	LC 1015	HEATER E-13A DRAINS	L	M	M	H	4	D
S 52	20	LC 1020	HEATER E-15A DUMP	L	M	M	H	4	D
S 52	20	LC 1052	HEATER E-12B DRAINS	L	M	M	H	4	D
S 52	20	LC 1053	HEATER E-12B DUMP	L	M	M	H	4	D
S 52	20	LC 1054	HEATER E-13B DRAINS	L	M	M	H	4	D
S 52	20	LC 1059	HEATER E-15B DUMP	L	M	M	H	4	D
S 52	6	M476 131A	HTR E-15A DUMP VALVE	L	M	L	M	4	E
S 52	6	M476 131B	HTR E-15A DUMP VALVE	L	M	L	M	4	E

S 52 6	M476 132A	HTR E-14A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 132B	HTR E-14A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 133A	HTR E-13A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 133B	HTR E-13A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 134A	HTR E-12A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 134B	HTR E-12A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 135A	HTR E-11A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 135B	HTR E-11A DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 136A		L	M	L	M	4	E
S 52 6	M476 136B		L	M	L	M	4	E
S 52 6	M476 140A	HTR E-11B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476 140B	HTR E-11B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-137A	HTR E-14B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-137B	HTR E-14B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-138A	HTR E-13B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-138B	HTR E-13B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-139A	HTR E-12B DUMP VALVE	L	M	L	M	4	E
S 52 6	M476-139B	HTR E-12B DUMP VALVE	L	M	L	M	4	E

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 52	A	These devices are numbered in this sequence because of their associated power sources, system, or components. No corrective actions are planned.					X		
S 52	B	Mirror-image arrangement will be corrected.	X						
S 52	C	This problem will be corrected by re-labeling.	X						

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 52	D	These components will be reorganized in order to comply with NUREG 0700 guidelines concerning arrangement of components or by function or associated component/system arrangement.	X						
S 52	E	Monticello will relocate these components to panel C 20.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 53	6.8.2.2	--	Arrangement of components does not follow an alphabetic or numerical sequence.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 53	37	(APRM CL1:METER)	APRM CHANNEL 1:METER	L	M	M	M	4	
S 53	37	(APRM CL2:METER)	APRM CHANNEL 2:METER	L	M	M	M	4	
S 53	37	(APRM CL3:METER)	APRM CHANNEL 3:METER	L	M	M	M	4	
S 53	37	(APRM CL4:METER)	APRM CHANNEL 4:METER	L	M	M	M	4	
S 53	37	(APRM CL5:METER)	APRM CHANNEL 5:METER	L	M	M	M	4	
S 53	37	(APRM CL6:METER)	APRM CHANNEL 6:METER	L	M	M	M	4	
S 53	37	(LPRM G1:METER)	LPRM G1:METER)	L	M	M	M	4	
S 53	37	(LPRM G2:METER)	LPRM G2:METER)	L	M	M	M	4	
S 53	37	(RBM CL7:METER)	RBM CHANNEL 7:METER	L	M	M	M	4	
S 53	37	(RBM CL8:METER)	RBM CHANNEL 8:METER	L	M	M	M	4	
S 53	252A	PI 7636	TANK V-802	L	M	M	L	4	
S 53	252A	PI 7644	TANK V-803	L	M	M	L	4	
S 53	252A	PI 7652	TANK V-804	L	M	M	L	4	
S 53	252A	PI 7660	TANK V-805	L	M	M	L	4	
S 53	252A	PI 7668	TANK V-806	L	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 53		Monticello does not plan to change these components because their current arrangement corresponds to their assignments within systems.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 54	6.8.2.3	--	Layout of identical components is not consistent at different locations.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 54	4	PI 13-93	PUMP DISCH	M	H	H	L	2	A
S 54	4	PI 13-94	STEAM SUPPLY	M	H	H	L	2	A
S 54	4	PI 13-95	TURBINE DISCH	M	H	H	L	2	A
S 54	4	PI 13-96	PUMP SUCTION	M	H	H	L	2	A
S 54	5	S4A	ATWS A RESET	M	H	H	L	2	B
S 54	5	S4B	ATWS B RESET	M	H	H	L	2	B
S 54	5	S5A	ATWS A MAN	M	H	H	M	2	B
S 54	5	S5B	ATWS B MAN	M	H	H	M	2	B
S 54	5	S5C	ATWS C MAN	M	H	H	M	2	B
S 54	5	S5D	ATWS D MAN	M	H	H	M	2	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 54	A	These components will be re-arranged.	X						
S 54	B	The mirror-image problem will be resolved.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 55	6.8.3.2	--	Large groups of similar components should be organized into groups of five components or fewer, or labelled with coordinate axes.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 55	6	M476 131A	HTR E-15A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 131B	HTR E-15A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 132A	HTR E-14A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 132B	HTR E-14A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 133A	HTR E-13A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 133B	HTR E-13A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 134A	HTR E-12A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 134B	HTR E-12A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 135A	HTR E-11A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 135B	HTR E-11A DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 136A		L	M	L	M	4	A
S 55	6	M476 136B		L	M	L	M	4	A
S 55	6	M476 140A	HTR E-11B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476 140B	HTR E-11B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-137A	HTR E-14B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-137B	HTR E-14B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-138A	HTR E-13B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-138B	HTR E-13B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-139A	HTR E-12B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-139B	HTR E-12B DUMP VALVE	L	M	L	M	4	A
S 55	6	M476-141A	MO 1133 - B 1207 AFW CV BLOCK VL	L	M	M	L	4	B
S 55	6	M476-141B	MO 1133 - B 1207 AFW CV BLOCK VL	L	M	M	L	4	B
S 55	6	M476-142A	MO 1134 - B 1231 BFW CV BLOCK VL	L	M	M	L	4	B

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COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 55	6	M476-142B	MO 1134 - B 1231 BFW CV BLOCK VL	L	M	M	L	4	B
S 55	6	M476-143A	FW LINE B MANUAL VALVE	L	M	M	L	4	B
S 55	6	M476-143B	FW LINE B MANUAL VALVE	L	M	M	L	4	B
S 55	6	M476-144A	FW LINE A MANUAL VALVE	L	M	M	L	4	B
S 55	6	M476-144B	FW LINE A MANUAL VALVE	L	M	M	L	4	B
S 55	6	M476 246A	ECCS SUMP PUMP P-88A	L	M	H	M	4	C
S 55	6	M476 246B	ECCS SUMP PUMP P-88A	L	M	H	M	4	C
S 55	6	M476 247A	ECCS SUMP PUMP P-88B	L	M	H	H	4	C
S 55	6	M476 247B	ECCS SUMP PUMP P-88B	L	M	H	H	4	C
S 55	6	M476-248A	ECCS SUMP PUMP P-88C	L	M	H	M	4	C
S 55	6	M476-248B	ECCS SUMP PUMP P-88C	L	M	H	M	4	C
S 55	6	M476-249A	ECCS SUMP PUMP P-88D	L	M	H	M	4	C
S 55	6	M476-249B	ECCS SUMP PUMP P-88D	L	M	H	M	4	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 55	A	These components will be moved to the panel C20 and enhanced through hierarchical labeling and demarcation lines. These enhancements will provide an adequate resolution of the problem.	X						
S 55	B	This problem will be resolved as part of the control room relabeling project.							X
S 55	C	These components will be relocated to panel C03 with their associated system.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 56	6.9.1.1(a)	--	Visual displays should be close to their associated controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 56	3	10A-S25A	11 RHR MIN FLOW CV 1994	M	H	H	M	2	
S 56	3	10A-S25B	12 RHR MIN FLOW CV 1995	M	H	H	M	2	
S 56	3	10A-S25C	13 RHR PUMP MIN FLOW CV 1996	M	H	H	M	2	
S 56	3	10A-S25D	14 RHR PUMP MIN FLOW CV 1997	M	H	H	M	2	
S 56	6	HS-1012	HTR E11-A DUMP VALVE	M	H	L	L	4	
S 56	6	HS-1051	HTR E11-B DUMP VALVE	M	H	L	L	4	
S 56	6	M476 135A	HTR E-11A DUMP VALVE	M	H	L	M	3	
S 56	6	M476 135B	HTR E-11A DUMP VALVE	M	H	L	M	3	
S 56	6	M476 140A	HTR E-11B DUMP VALVE	M	H	L	M	3	
S 56	6	M476 140B	HTR E-11B DUMP VALVE	M	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 56		These components will be relocated to bring together displays and controls from related systems.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 57	6.9.1.1(c)	--	Related displays and controls are not easily associated. Demarcation lines are not complete and mimics are in poor repair.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 57			--	M	M	-	-	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 57		Monticello will continue their efforts in enhancing the panel organization that is already in place with demarcations and/or background graphics and relocating components when they are separated from their associated systems.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 58	6.9.2.1(b)	--	Sequence of use of components is not an orderly progression.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 58	3		(AUTO BLWDN SYS)	L	M	H	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 58		These controls will be rearranged into an acceptable arrangement as detailed in NUREG 0700.	X						

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 59	6.9.2.2(a),b,c	--	Displays should be in matching rows above their respective controls or groups of controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 59	7	POI 1771	INTERMED STOP VA 1 POSITION	L	M	M	L	4	
S 59	7	POI 1772	INTERMED STOP VA 2 POSITION	L	M	M	L	4	
S 59	7	POI 1773	INTERMED STOP VA 3 POSITION	L	M	M	L	4	
S 59	7	POI 1774	INTERMED STOP VA 4 POSITION	L	M	M	L	4	
S 59	7	POI 1775	INTERCEPT VALVE 1 POSITION	L	M	M	L	4	
S 59	7	POI 1776	INTERCEPT VALVE 2 POSITION	L	M	M	L	4	
S 59	7	POI 1777	INTERCEPT VALVE 3 POSITION	L	M	M	L	4	
S 59	7	POI 1778	INTERCEPT VALVE 4 POSITION	L	M	M	L	4	
S 59	7	POI 1779	MAIN STOP VA 1 POS	L	M	H	H	4	
S 59	7	POI 1780	MAIN STOP VA 2 POS	L	M	H	H	4	
S 59	7	POI 1781	MAIN STOP VALVE 3 POSITION	L	M	H	H	4	
S 59	7	POI 1782	MAIN STOP VALVE 4 POSITION	L	M	H	H	4	
S 59	7	POI 1783	MAIN CONT VALVE 1 POSITION	L	M	M	M	4	
S 59	7	POI 1784	MAIN CONT VALVE 2 POSITION	L	M	M	M	4	
S 59	7	POI 1785	MAIN CONT VALVE 3 POSITION	L	M	M	M	4	
S 59	7	POI 1786	MAIN CONT VALVE 4 POSITION	L	M	M	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 59		Monticello does not plan to correct this problem. In their judgment the control-display relation is acceptable as it is.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 60	6.9.3.1(c)	--	There is a time lag between the system state and the display on the component.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 60	4	FI 12-140	DUMP FLOW	L	H	M	L	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 60		This is a system hydraulics problem rather than a control problem. Monticello will consider including a permanent information tag.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 61	6.6.1.1	--	Major labels should identify major systems and subordinate labels should identify subsystems or functional groups.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 61			--	H	L	-	-	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 61		This problem will be addressed in the control room relabeling project.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 62	6.4.1.1(a)(2)	--	Switch is imprecise and will not close properly.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 62	3	10A-S10A	RHR INJ OBD MO 2012	M	H	H	M	2	
S 62	3	10A-S12B	TORUS COOL TEST MO 2009	M	H	H	M	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 62		This is a valve torque switch problem. These type problems are addressed/resolved by maintenance activities.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 63	6.4.1.1(b)	--	This control is no longer necessary for plant operation. Unnecessary equipment should be removed.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 63	6	HS-1345	DEMIN TRANS V AO 1345	L	L	L	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 63		These components will be checked by Monticello against plant procedures for the possible need to retain it. If it is truly unnecessary it will be removed.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 64	6.5.1.1(b)	--	Meters have insufficient range.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 64	4	2-184-24A	PUMP A POWER	L	H	L	M	3	
S 64	4	2-184-24B	PUMP B POWER	L	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 64		Monticello will rescale these meters.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 65	6.5.1.1(b)	--	Meters have insufficient precision when recirc is running.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 65	3	LI 2-3-91A	REACTOR LEVEL A	M	H	H	H	2	
S 65	3	LI 2-3-91B	REACTOR LEVEL B	M	H	H	H	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 65		Monticello will add an information tag, as specified in the convention spec. It is a shortcoming of the system which has no solution other than to understand that the accuracy of the indication is compromised in some situations.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 66	6.5.1.1(b)	--	Indication for this parameter is not available in control room.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 66	8	(115 KV BUS VOL)	115 KV BUS VOLTAGE	M	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 66		Monticello plant already provides a trend recorder for this data. Monticello engineering believes that operators have no need to control this value, and no change is planned to provide control.					X		

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 67	6.5.1.1(c)	--	Information is unnecessary in prime operating area.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 67	5	SS 3A-S5	STAB VALVE 3-25-8	M	L	L	L	5	
S 67	7	(VIB PHASE ANGLE)		M	L	M	H	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 67	A	This component will be reviewed by Monticello personnel, and re-located on a back panel if it is not needed in the primary operating area.							X
S 67	B	The need for this device has been evaluated. It has been determined that there is a need for this device at its present location. No corrective actions will be taken.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 68	6.5.1.1(e)	--	Demand information only is available--actual state of equipment is not shown.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 68	6	HS-7956	TORUS AIR ISO CV-7956	H	H	M	L	1	A
S 68	13	1-DS13	VALVE CONTROL CHANNEL 1:BALL VAL	H	H	L	L	1	B
S 68	13	1-DS14	VALVE CONTROL CHANNEL 1:BALL VAL	H	H	L	L	1	B
S 68	13	2-DS23	VALVE CONTROL CHANNEL 2:BALL VAL	H	H	L	L	1	B
S 68	13	2-DS24	VALVE CONTROL CHANNEL 2:BALL VAL	H	H	L	L	1	B
S 68	13	3-DS33	VALVE CONTROL CHANNEL 3:BALL VAL	H	H	L	L	1	B
S 6B	13	3-DS34	VALVE CONTROL CHANNEL 3:BALL VAL	H	H	L	L	1	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 68	A	The ball valve indication is a direct position indication. No corrective action is required.							X
S 6G	B	The ball valve indication is a direct position indication. No corrective action is required.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 69	6.5.1.2(a)	--	Scale units are not consistent with the precision needed by the operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 69	4	AM 2A-M8A	GEN DRIVE MOTOR A	L	H	L	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 69		These meter scales will be enhanced to provide the need precision.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 70	6.5.1.2(f)	--	Display dynamic sensitivity does not minimize the display of normal random variations in equipment performance.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
S 70	6	LR 1278	HOTWELL LEVEL	L	M	M	M	4	A
S 70	7	FR 1250	AIR EJECTOR OFF-GAS FLOW	L	M	M	M	4	A
S 70	252B	FR 7492A	OFFGAS FLOW	L	M	L	L	4	B
S 70	252B	FR 7508A	#11 EDUCTOR STEAM FLOW & OUTLET	L	M	M	L	4	B
S 70	252C	FR 7492B	OFFGAS FLOW	L	M	L	L	4	B
S 70	252C	FR 7508B	#12 EDUCTOR STEAM FLOW & OUTLET	L	M	M	L	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 70	A	These meters will be reviewed by the Monticello systems engineer and the I & C supervisor in order to provide a solution that minimizes the fluctuations.							X
S 70	B	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
S 71	6.1.5.5(b)	--	Distractions could be caused by a radio in the control room.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
S 71		The question of distractions caused by a radio in the control room has been discussed and agreed upon by the NRC. No changes are planned.						X	

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 1	6.3.3.4	ANNUNCIATOR	Annunciators are not available near related controls and displays.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 1	3	C03-B-16	MAIN STEAM LINE CH A HI RADIATIO	L	L	H	L	4	
T 1	3	C03-B-32	MAIN STEAM LINE CH B HI RADIATIO	L	L	H	L	4	
T 1	3	C03-B-55	REACTOR BLDG EXH PLENUM HI RAD	L	L	L	L	5	
T 1	3	C03-B-56	HIGH AREA TEMP STEAM LEAK	L	L	H	L	4	
T 1	4	C04-A-01	REFUELING FL AREA HI RADIATION	L	M	M	H	4	
T 1	4	C04-A-06	NEW FUEL STORAGE AREA HI RADIATI	L	M	M	L	4	
T 1	4	C04-A-11	REACTOR BUILDING HI RADIATION	L	M	M	L	4	
T 1	4	C04-A-16	CR LAB SHOP HI RADIATION	L	M	M	L	4	
T 1	4	C04-A-21	TURBINE BUILDING HI RADIATION	L	M	M	L	4	
T 1	4	C04-A-26	RADWASTE BUILDING HI RADIATION	L	M	M	L	4	
T 1	5	C05-A-01	REAC BLDG VENT & F P RAD CH A-HI	L	L	H	H	4	
T 1	5	C05-A-02	REAC BLDG VENT & F P RAD CH B-HI	L	L	H	H	4	
T 1	5	C05-A-46	[BLANK]	L	L	H	X	4	
T 1	5	C05-A-54	SRV OPEN	L	L	H	H	4	
T 1	5	C05-B-35	TURBINE STOP VALVE CLOSURE SCRAM	L	L	H	H	4	
T 1	5	C05-B-36	GENERATOR FAST CLOSURE SCRAM TRI	L	L	H	H	4	
T 1	6	C06-B-09	HIGH WTR LEVEL RHR ROOM A	L	L	H	M	4	
T 1	6	C06-B-10	HIGH WTR LEVEL RHR ROOM B	L	L	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 1		These problems will be covered in the overall alarm system review.							

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 2	6.3.1.2	ANNUNCIATOR	Annunciator setpoints are not appropriate for procedural requirements.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 2	3	C03-A-30	RX LO PRESS	L	M	H	H	4	
T 2	3	C03-B-45	RHR HIGH REACTOR PRESS	L	M	H	M	4	
T 2	3	C03-B-56	HIGH AREA TEMP STEAM LEAK	L	M	H	L	4	
T 2	4	C04-A-23	LIQUID PROCESS HI RADIATION	L	M	M	L	4	
T 2	4	C04-B-04	SUPPRESSION WATER LEVEL HI/LOW	L	M	H	M	4	
T 2	4	C04-B-35	DRYWELL & SUPP CHAM PRESS HI	L	M	M	L	4	
T 2	5	C05-B-19	REACTOR VESSEL LO LEVEL SCRAM TR	L	M	M	M	4	
T 2	5	C05-B-28	DRYWELL HI PRESS SCRAM TRIP	L	M	H	H	4	
T 2	5	C05-B-30	DISCH VOLUME TANK NOT DRAINED	L	M	M	L	4	
T 2	5	C05-B-53	DRYWELL - TORUS AIR HI TEMP	L	M	H	M	4	
T 2	6	C06-B-12	CST # 11 & 12 LOW LOW					C	
T 2	24A	C24A-02	SBGT LOW FLOW	L	M	H	M	4	
T 2	24B	C24B-02	SBGT LOW FLOW	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 2		Monticello will review the setpoints in these alarms and modify setpoints as required.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 3	6.3.3.4	ANNUNCIATOR	Annunciator text is ambiguous.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 3	3	C03-B-49	LPCI INITIATION SEALED IN	L	H	H	H	3	
T 3	4	C04-A-16	CR LAB SHOP HI RADIATION	L	M	M	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 3		Clarity of the alarm message will be covered in the alarm system review.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 4	6.4.1.1(b)	SWITCH	Control design does not meet a general requirement for simple and effective controls.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 4	3	2E-S2A	LOGIC A TIMER 2E-S2A	L	M	H	H	4	A
T 4	3	2E-S2B	LOGIC B TIMER 2E-S2B	L	M	H	H	4	A
T 4	5	16A-S33	ISOL VALVE RESET	L	M	H	L	4	B
T 4	5	5A-S1	REACTOR MODE RPS/PCIS	L	M	H	H	4	C
T 4	25	HS 8034I	V-RF-1 DISCH DAMPER POS [V-D-15]	L	M	H	M	4	D
T 4	25	HS 8034J	V-RF-1 DISCH DAMPER POS [V-D-16]	L	M	H	M	4	D
T 4	25	HS 8034K	V-RF-2 DISCH DAMPER POS [V-D-17]	L	M	H	M	4	D
T 4	25	HS 8034K	V-RF-2 DISCH DAMPER POS [V-D-17]	L	M	H	M	4	D
T 4	25	HS 8034L	V-RF-2 DISCH DAMPER POS [V-D-18]	L	M	H	M	4	D
T 4	25	HS 8034M	V-RF-3 DISCH DAMPER POS [V-D-19]	L	M	H	M	4	D
T 4	25	HS 8034M	V-RF-3 DISCH DAMPER POS [V-D-19]	L	M	H	M	4	D
T 4	25	HS 8034N	V-RF-3 DISCH DAMPER POS [V-D-20]	L	M	H	M	4	D
T 4	25	HS 8034P	V-RF-4 DISCH DAMPER POS [V-D-21]	L	M	H	M	4	D
T 4	25	HS 8034P	V-RF-4 DISCH DAMPER POS [V-D-21]	L	M	H	M	4	D
T 4	25	HS 8034Q	V-RF-4 DISCH DAMPER POS [V-D-22]	L	M	H	M	4	D

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 4	A	The logic timers were changed during a design change that included some redesign of the system and relabelling of the controls. These changes will be reviewed to ensure they solve the principle problem with these controls, the need to reset the logic timers every two minutes once the timers are initiated.							X

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RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 4	B	Monticello feels that this control is acceptable. No corrective action is planned.					X		
T 4	C	Monticello has not experienced significant problems with this switch. Problems with the Mode switch is a generic BWR problem. The BWR Owners group is funding research on this device. Monticello will consider replacing this device when an improved switch is available.							X
T 4	D	Monticello feels that these controls are acceptable. No corrective action is planned.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 5	6.4.1.1(c)	SWITCH	Control design should be suitable for the anthropometric and ergonometric characteristics of the expected operator population.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 5	11	18-51U	CONDENSATE SYSTEM AREA MON	M	L	H	L	4	A
T 5	11	18-51V	FEEDWATER PUMP AREA MON	M	L	H	L	4	A
T 5	11	18-51W	RADWASTE CONTROL ROOM AREA MON	M	L	H	L	4	A
T 5	11	18-51X	SAMPLE TANK AREA MON	M	L	H	L	4	A
T 5	11	18-51Y	CONVEYOR OPERATING AREA MON	M	L	H	L	4	A
T 5	11	18-51Z	MACHINE SHOP AREA MON	M	L	H	L	4	A
T 5	21	C21-01	ABOVE OUTBOARD ISOL VLV MO-2398	L	H	H	M	3	B
T 5	21	C21-02	ABOVE 11 CLEANUP RECIRC PUMP	L	H	H	M	3	B
T 5	21	C21-03	ABOVE 11 CLEANUP RECIRC PUMP	L	H	H	M	3	B
T 5	21	C21-04	ABOVE 12 CLEANUP RECIRC PUMP	L	H	H	M	3	B
T 5	21	C21-06	ABOVE 12 CLEANUP RECIRC PUMP	L	H	H	M	3	B
T 5	21	C21-07	ABOVE REG HEAT EXCHANGER	L	H	H	M	3	B
T 5	21	C21-08	ABOVE NON-REG HEAT EXCHANGER	L	H	H	M	3	B
T 5	21	C21-09	ABOVE NON-REG HEAT EXCHANGER	L	H	H	M	3	B
T 5	21	C21-11	ABOVE STM LINE N/NE CORNER TORUS	L	H	H	M	3	B
T 5	21	C21-12	RCIC ROOM CEILING 175 DEG	L	H	H	M	3	B
T 5	21	C21-13	ABOVE TURBINE EXHAUST LINE	L	H	H	M	3	B
T 5	21	C21-14	ABOVE RCIC TURBINE 175 DEG.	L	H	H	M	3	B
T 5	21	C21-16	ABOVE OUTBOARD MSIV A	L	H	H	M	3	B
T 5	21	C21-17	ABOVE OUTBOARD MSIV B	L	H	H	M	3	B
T 5	21	C21-18	ABOVE OUTBOARD MSIV C	L	H	H	M	3	B
T 5	21	C21-19	ABOVE OUTBOARD MSIV D	L	H	H	M	3	B

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 5	21	C21-21	ABOVE STM LINE N/NW CORNER TORUS	L	H	H	M	3	B
T 5	21	C21-22	ABOVE HPCI TURBINE	L	H	H	M	3	B
T 5	21	C21-23	ABOVE STM LINE E WALL OF HPCI RM	L	H	H	M	3	B
T 5	21	C21-24	HPCI CEILING	L	H	H	M	3	B
T 5	21	C21-26	ABOVE RHR PUMP 11	L	H	H	M	3	B
T 5	21	C21-27	ABOVE RHR PUMP 13	L	H	H	M	3	B
T 5	21	C21-28	BY RHR HEAT EXCHANGER 11	L	H	H	M	3	B
T 5	21	C21-29	TORUS RING HEADER 11, 13 PUMP	L	H	H	M	3	B
T 5	21	C21-31	ABOVE RHR PUMP 12	L	H	H	M	3	B
T 5	21	C21-32	ABOVE RHR PUMP 14	L	H	H	M	3	B
T 5	21	C21-33	TORUS RING HDR 12,14 PUMP SUCT.	L	H	H	M	3	B
T 5	21	C21-34	BY RHR HEAT EXCHANGER 12	L	H	H	M	3	B
T 5	21	TI 12-138	STEAM LEAK INDICATOR	L	H	H	M	3	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 5	A	Monticello feels that these controls are acceptable. No corrective actions are planned.					X		
T 5	B	Monticello will modify the switch to make the operation more comfortable.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 7	6.9.1.1(a)	SWITCH	Controls should be located near their related displays.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 7	3	10A-S25A	11 RHR MIN FLOW CV 1994	M	M	H	M	4	A
T 7	3	10A-S25B	12 RHR MIN FLOW CV 1995	M	M	H	M	4	A
T 7	3	10A-S25C	13 RHR PUMP MIN FLOW CV 1996	M	M	H	M	4	A
T 7	3	10A-S25D	14 RHR PUMP MIN FLOW CV 1997	M	M	H	M	4	A
T 7	4	HS-2994	DRYWELL PT SELECTION	L	M	H	L	4	B
T 7	7	PI 1246	AIR EJCT E-2A STM IN PRESS	M	H	M	L	3	C
T 7	7	PI 1247	AIR EJCT E-2B STM IN PRESS	M	H	M	L	3	C
T 7	5	LI 6-94A	REACTOR VESSEL LEVEL A	M	H	M	L	3	D
T 7	5	LI 6-94B	REACTOR VESSEL LEVEL B	M	H	M	L	3	D
T 7	10	17-453A	SPENT FUEL POOL CHANNEL A	M	H	H	H	2	D
T 7	10	17-453B	SPENT FUEL CHANNEL B	M	H	H	H	2	D
T 7	257	RI 7859A	RX BLDG VENT RAD MON CH A	M	H	H	H	2	D
T 7	258	RI 7859B	RX BLDG VENT RAD MON CH B	M	H	H	H	2	D
T 7	252B	FY 7491A	TRAIN A INLET GAS	M	H	M	L	3	E
T 7	252C	FY 7491B	TRAIN B INLET GAS	M	H	M	L	3	E

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 7	A	Monticello will relocate these position indicating lights adjacent to their associated control switches.	X						
T 7	B	Monticello will relocate this switch near the PR 2994 recorder.	X						

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 7	C	Monticello will relocate this PI near its associated pressure controller.	X						
T 7	D	Monticello feels that the location of these displays is acceptable. This information is also supplied by the SPDS system. No corrective actions are planned.					X		
T 7	E	The solution to these discrepancies will be resolved as part of the solution to all discrepancies associated with panels C252 A thru D.							X
T 7	F	Monticello will review panel C259 and associated panels to develop options for relabeling to indicate which components are used for operations, and which are only used for instrumentation calibration.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 8	6.9.1.1(c)	CONTROLLER	The relationship between control and displays should be clearly shown on the panel by labeling, coding, demarcation, etc.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 8	4	12-143	DRAIN FLOW REGULATOR	L	M	L	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 8		Monticello plans to relocate this device near its associated flow indicator.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 9	6.9.3.2(d)	SWITCH	Feedback on the display should be visible during control operation.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 9	5	16A-S32	INBOARD \ GROUP 1 ISO VALVES AUT	L	M	H	M	4	
T 9	5	16A-S33	ISOL VALVE RESET	L	M	H	L	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 9		Monticello will relocate these switches with the main steam line valves on panel C04.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 10	6.1.1.1(a)		Controls and displays should be available in the CR for detection of abnormal conditions and safely shutting down the plant.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 10		*	APRS TIMER	L	H	H	L	3	1
T 10		*	DEGRADED VOLTAGE ON BUS ALARM	L	H	H	H	3	2
T 10		*	LOSS OF VOLTAGE TO BUS ALARM	L	H	M	H	3	3
T 10		*	CRD 14 CONTROL	L	H	M	L	3	4
T 10		*	CRD 30 CONTROL	L	H	M	L	3	5
T 10		*	CRD 8 CONTROL	L	H	M	L	3	6
T 10		*	CRD BYPASS INJ TO VESSEL CONTROL	L	H	M	L	3	7
T 10		*	CRD TEST BYPASS CONTROL	L	H	M	L	3	8
T 10		*	CRD VESSEL INJ VIA RWCU CONTROL	L	H	M	L	3	9
T 10		*	# 11 EDG SPEED INDICATOR	L	H	H	M	3	11
T 10		*	# 12 EDG SPEED INDICATOR	L	H	H	M	3	12
T 10		*	[V-D-10] CONTROL	L	H	H	H	3	13
T 10		*	[V-D-11] CONTROL	L	H	H	H	3	14
T 10		*	[V-D-12] CONTROL	L	H	H	H	3	15
T 10		*	[V-D-13] CONTROL	L	H	H	H	3	16
T 10		*	[V-D-14] CONTROL	L	H	H	H	3	17
T 10		*	[V-D-23] CONTROL	L	H	H	H	3	18
T 10		*	[V-D-24] CONTROL	L	H	H	H	3	19
T 10		*	[V-D-25] CONTROL	L	H	H	H	3	20
T 10		*	[V-D-26] CONTROL	L	H	H	H	3	21
T 10		*	[V-D-7] CONTROL	L	H	H	H	3	22
T 10		*	[V-D-8] CONTROL	L	H	H	H	3	23
T 10		*	[V-D-9] CONTROL	L	H	H	H	3	24

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 10		*	LEAD B8-31 CONTROL	L	H	M	H	3	25
T 10		*	LEAD B8-58 CONTROL	L	H	M	H	3	25
T 10		*	AREA HIGH WATER LEVEL ALARM	L	H	H	M	3	26
T 10		*	RX BUILDING WATER LEVEL ALARM	L	H	M	M	3	26
T 10		*	RCIC WATER LEVEL ALARM	L	H	H	M	3	26
T 10		*	COND E-1B HOTWELL LO LEVEL ALARM	L	H	M	L	3	27
T 10		*	COND STOR TK # 12 LEVEL ALARM	L	H	H	H	3	28
T 10		*	CST # 12 LOW LOW ALARM	L	H	M	L	3	29
T 10		*	EQUIP DRAIN SUMP WATER LEVEL ALM	L	H	H	M	3	30
T 10		*	FLOOR DRAIN SUMP WATER LEVEL ALM	L	H	H	M	3	31
T 10		*	RHR A WATER LEVEL INDICATOR	L	H	H	M	3	32
T 10		*	RHR B WATER LEVEL INDICATOR	L	H	H	M	3	33
T 10		*	HPCI ROOM WATER LEVEL INDICATOR	L	H	H	M	3	34
T 10		*	RCIC ROOM WATER LEVEL ALARM	L	H	H	M	3	35
T 10		*	RCIC ROOM WATER LEVEL INDICATOR	L	H	H	M	3	36
T 10		*	RHR A&B ROOMS LVL ALM & INDIC	L	H	H	M	3	37
T 10		*	RHR A WATER LEVEL ALARM	L	H	H	M	3	38
T 10		*	RHR A&B C SPRAY HDR WTR LVL ALM	L	H	M	L	3	39
T 10		*	RHR A&B C SPRAY HDR WTR LVL IND	L	H	M	L	3	39
T 10		*	RHR B INJ ROOM WTR LVL ALARM	L	H	M	L	3	40
T 10		*	RHR B INJ ROOM WTR LVL INDIC	L	H	M	L	3	41
T 10		*	RHR B WATER LEVEL ALARM	L	H	H	M	3	43
T 10		*	RWCU AREA WATER LVL IND & ALM	L	H	M	L	3	45
T 10		*	SCRAM DISCHARGE VOL LEVEL INDIC	L	H	H	M	3	47
T 10		*	SHTDWN CLNG WTR LVL ALM & INDIC	L	H	M	L	3	48
T 10		*	STEAM CHASE RM WTR LVL ALM & IND	L	H	M	L	3	49
T 10		*	TORUS ROOM WATER LEVEL INDIC	L	H	M	L	3	50
T 10		*	TORUS AREA WATER LEVEL ALARM	L	H	M	L	3	51
T 10		*	30% OF 1ST STAGE PRESSURE TREND	L	H	H	H	3	52
T 10		*	30% OF 1ST STAGE PRESSURE TREND	L	H	H	H	3	52
T 10		*	AI-15 CONTROL	L	H	M	L	3	53
T 10		*	C/F W/MAKEUP FROM CST CONTROL	L	H	M	L	3	54
T 10		*	COND FW FLOW CONTROLLER	L	H	M	L	3	55
T 10		*	COND SRV WTR PRESS STAT INDIC	L	H	M	L	3	56
T 10		*	COND SRV WTR PRESS STAT CONTROL	L	H	M	L	3	56
T 10		*	CST-101 PRESS BYPASS VLV CONTROL	L	H	M	L	3	57
T 10		*	CST-101-2 PRESS BYPASS VLV CNTRL	L	H	M	L	3	58

T 10	*	CRD DRIVE PRESS CONTROL	L	H	M	L	3	59
T 10	*	HCV CHARGING WTR HDR VLV CONTROL	L	H	M	L	3	60
T 10	*	HEADER AIR PRESSURE ALARM	L	H	H	L	3	61
T 10	*	HEADER AIR PRESSURE INDICATION	L	H	H	L	3	61
T 10	*	HI HPCI STEAM FLOW INDICATION	L	H	H	H	3	62
T 10	*	HPCI STEAM LINE LO PRESSURE ALM	L	H	H	H	3	63
T 10	*	LPCI INITIATION SEALED INDIC	L	H	M	L	3	64
T 10	*	RFP AUX OIL PUMPS RUNNING INDIC	L	H	H	M	3	65
T 10	*	PDS 1532 CONTROL	L	H	M	L	3	66
T 10	*	PDS 1533 CONTROL	L	H	M	L	3	67
T 10	*	H2 CONCENTR ALM AND TREND	L	H	M	L	3	68
T 10	*	RCIC STEAM LINE LO PRESSURE ALM	L	H	H	L	3	69
T 10	*	RECIRC PUMP A SPEED CTRL	L	H	H	M	3	70
T 10	*	RECIRC PUMP B SPEED CTRL	L	H	H	M	3	71
T 10	*	ROD POSITION INDICATOR TREND	L	H	H	H	3	72
T 10	*	SCRAM AIR HEADER VENT VLV CNTRL	L	H	M	L	3	73
T 10	*	SECONDARY CONT DIFF PRESS ALARM	L	H	H	H	3	74
T 10	*	RHR B INJ ROOM RAD INDICATION	L	H	M	L	3	76
T 10	*	RHR B INJ ROOM RAD ALARM	L	H	M	L	3	77
T 10	*	RWCU AREA RAD ALARM	L	H	M	L	3	78
T 10	*	RWCU AREA RAD INDICATION	L	H	M	L	3	78
T 10	*	SHTDWN CLNG PIPING AREA RAD ALM	L	H	M	L	3	79
T 10	*	SHTDWN CLNG PIPING AREA RAD IND	L	H	M	L	3	79
T 10	*	SPENT FUEL RAD TREND	L	H	H	H	3	80
T 10	*	STEAM CHASE ROOM RAD ALARM	L	H	H	L	3	81
T 10	*	STEAM CHASE ROOM RAD INDICATION	L	H	H	L	3	81
T 10	*	TORUS ROOM RAD ALARM	L	H	M	L	3	82
T 10	*	TORUS ROOM RAD INDICATION	L	H	M	L	3	82
T 10	*	# 11 RFP OIL CONTROL	L	H	M	H	3	83
T 10	*	# 12 RFP OIL CONTROL	L	H	M	H	3	84
T 10	*	RFP SUCTION PRESSURE INDIC	L	H	M	L	3	85
T 10	*	CS/RHR W/COND. SW PS CONTROL	L	H	M	L	3	86
T 10	*	CST 83 BYPASS VLV CONTROL	L	H	M	L	3	87
T 10	*	RHR A SUCTION PRESSURE INDIC	L	H	M	L	3	88
T 10	*	CST 101-2 PRESS BYPASS CONTROL	L	H	M	L	3	89
T 10	*	RHR B SUCTION PRESSURE INDIC	L	H	H	M	3	90
T 10	*	RHR DISCHARGE PRESSURE INDIC	L	H	H	M	3	91
T 10	*	RHR PRESSURE INDIC	L	H	H	M	3	92
T 10	*	RHR PRESSURE 11 INDIC	L	H	H	M	3	93
T 10	*	RHR PRESSURE 12 INDIC	L	H	H	M	3	94
T 10	*	RHR PRESSURE 13 INDIC	L	H	H	M	3	95
T 10	*	RHR PRESSURE 14 INDIC	L	H	H	M	3	96
T 10	*	RHR SUCTION PRESSURE INDICATION	L	H	H	M	3	97
T 10	*	RHR SERVICE WATER CROSSTIE CNTRL	L	H	M	L	3	98

T 10	*	RHR SERVICE WATER CROSSTIE CNTRL	L	H	M	L	3	99
T 10	*	RHR SERVICE WATER CONTROL	L	H	M	L	3	100
T 10	*	RHR SERVICE WATER VLVS CONTROLS	L	H	M	M	3	101
T 10	*	SBLC (BORON) CONTROL	L	H	M	M	3	103
T 10	*	SBLC (TEST) CONTROL	L	H	H	L	3	104
T 10	*	SERVICE WTR CROSSTIE TO C/F CNTL	L	H	M	L	3	105
T 10	*	SERVICE WATER PUMP FLOW INDIC	L	H	M	L	3	106
T 10	*	SW 145 CONTROL	L	H	M	L	3	108
T 10	*	SW 145 COND PRESS STATION CNTRL	L	H	M	L	3	109
T 10	*	SW 146 CONTROL	L	H	M	L	3	110
T 10	*	SW 147 CONTROL	L	H	M	L	3	111
T 10	*	SW 147 COND PRESS STATION CNTRL	L	H	M	L	3	112
T 10	*	SW X-TIE TO C/F CONTROL	L	H	M	L	3	113
T 10	*	RHR A&B CONT SPRAY HDR TEMP ALM	L	H	H	M	3	114
T 10	*	RHR A&B CONT SPRAY HDR TEMP IND	L	H	H	M	3	115
T 10	*	RHR B INJ ROOM TEMP ALARM	L	H	M	L	3	116
T 10	*	RHR B INJ ROOM TEMP INDIC	L	H	M	L	3	116
T 10	*	SHTDWN CLNG PIPING AREA TEMP ALM	L	H	M	L	3	117
T 10	*	SHTDWN CLNG PIPING AREA TEMP IND	L	H	M	L	3	117

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 10		This a set of specific problems--equipment identified in the Task Analysis/Verification that is not in the CR. See Appendix F in this report for an evaluation of the individual cases/components. The correction codes for this HED are numbered to match the resolutions in Appendix F.							X

HUMAN ENGINEERING DISCREFANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 11	6.5.1.1(e)	METERS, RECORDERS	Visual display of actual system/equip status should be displayed for all system paramters. Identify status/demand info on display

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 11	3	2E-S1A	RELIEF VALVE A RV-71A	L	L	H	H	4	A
T 11	3	2E-S1B	2 POSITION CTRL SW FOR RV 2-71B	L	L	H	H	4	A
T 11	3	2E-S1C	2 POSITION CTRL SW FOR RV 2-71C	L	L	H	H	4	A
T 11	3	2E-S4D	2 POSITION CTRL SW FOR RV 2-71D	L	L	H	H	4	A
T 11	3	2E-S4E	POSITION CTRL SW FOR RV 2-71E	L	L	H	H	4	A
T 11	3	2E-S4F	POSITION CTRL SW FOR RV 2-71F	L	L	H	H	4	A
T 11	3	2E-S4G	POSITION CTRL SW FOR RV 2-71G	L	L	H	H	4	A
T 11	3	2E-S4H	RELIEF VALVE H RV-71H	L	L	H	H	4	A
T 11	223D	2E-S7E	RELIEF VALVE	L	L	H	H	4	A
T 11	223D	2E-S7F	RELIEF VALVE	L	L	H	H	4	A
T 11	223D	2E-S7G	RELIEF VALVE	L	L	H	H	4	A
T 11	223D	2E-S7H	RELIEF VALVE	L	L	H	H	4	A
T 11	8	DG1/CS	NO.11 DIESEL GEN CONTROL	L	L	H	M	4	C
T 11	8	DG2/CS	NO.12 DIESEL GEN CONTROL	L	L	H	M	4	C
T 11	4	SI 7321	TURBINE RPM	L	M	M	L	4	D
T 11	5	(RPIS FULL CORE DIS)	ROD POSITION INDICATORS	L	L	H	H	4	D
T 11	25	8033I	V-D-15 DISCH DAMPER POS (V-RF-1)	L	L	H	M	4	E
T 11	25	8033J	V-D-16 DISCH DAMPER POS (V-RF-1)	L	L	H	M	4	E
T 11	25	8033K	V-D-17 DISCH DAMPER POS (V-RF-2)	L	L	H	M	4	E
T 11	25	8033L	V-D-18 DISCH DAMPER POS (V-RF-2)	L	L	H	M	4	E
T 11	25	8033M	V-D-19 DISCH DAMPER POS (V-RF-3)	L	L	H	M	4	E
T 11	25	8033N	V-D-20 DISCH DAMPER POS (V-RF-3)	L	L	H	M	4	E
T 11	25	8033P	V-D-21 DISCH DAMPER POS (V-RF-4)	L	L	H	M	4	E

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 11	25	8033Q	V-D-22 DISCH DAMPER POS (V-RF-4)	L	L	H	M	4	E
T 11	2	NR 18-55	AREA RADIATION	L	L	H	L	4	F

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 11	A	Monticello operators are adequately trained to recognize the operating status of the Automatic Depressurization System, safety relief valves. Backup sources of information are available. No additional corrective actions are planned.					X		
T 11	B	Monticello has already changed the design of the system, and the redesign will be reviewed as part of the CRDR.							
T 11	C	Monticello feels that this control is acceptable. The associated indicating light provides indication of the availability of control power. No corrective action is planned.					X		

RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 11	D	Monticello feels that the existing control rod position indicators are acceptable. No corrective actions are planned.					X		
T 11	E	Monticello will continue to review the position indication for the primary containment ventilation system to ensure that "status" information is available, or that "demand" information is clearly labeled as such.							X
T 11	F	Monticello will plan on providing this information via the SPDS system. The areas that should be available are indicated in the EOPs.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 12	6.5.1.2(a)	METERS, RECORDERS	Displays should use scale units that are consistent with the precision required by the operator.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 12	3	LI 2-3-91A	REACTOR LEVEL A	M	H	H	H	2	
T 12	3	LI 2-3-91B	REACTOR LEVEL B	M	H	H	H	2	
T 12	3	LR 2-3-113	RPV LEVEL	M	H	H	H	2	
T 12	3	PI 23-111	TURBINE STEAM INLET INDICATOR	M	H	H	L	2	
T 12	3	PI 23-112	TURBINE EXHAUST	M	H	H	L	2	
T 12	3	PLR 7251A	DW RAD/TORUS LVL/DW PRESS	M	H	H	L	2	
T 12	3	PLR 7251B	DW RAD/TORUS LVL/DW PRESS	M	H	H	L	2	
T 12	4	FI 12-140	DUMP FLOW	L	M	M	L	4	
T 12	4	PI 13-94	STEAM SUPPLY	L	M	H	L	4	
T 12	4	PI 13-95	TURBINE DISCH	L	M	H	L	4	
T 12	5	7-46A	APRM LOCAL POWER LEVEL	M	H	H	H	2	
T 12	5	7-46B	APRM LOCAL POWER LEVEL	M	H	H	H	2	
T 12	5	7-46C	APRM LOCAL POWER LEVEL	M	H	H	H	2	
T 12	5	7-46D	APRM LOCAL POWER LEVEL	M	H	H	H	2	
T 12	5	FPR 6-97	RX VESSEL PRESS/STEAM FLOW	M	H	M	M	3	
T 12	5	PI 1165	STBY LIQ CONT P PRESS	M	H	H	M	2	
T 12	5	PI 6-90A	REACTOR PRESS A	M	H	H	M	2	
T 12	5	PI 6-90B	REACTOR PRESS B	M	H	H	M	2	
T 12	7	PI 1220	STEAM PACKING EXH VAC	M	H	M	L	3	
T 12	7	PI 1246	AIR EJCT E-2A STM IN PRESS	M	H	M	L	3	
T 12	7	PI 1247	AIR EJCT E-2B STM IN PRESS	M	H	M	L	3	
T 12	8	W/GEN	NO. 1 MAIN GENERATOR	M	H	M	M	3	
T 12	2	NR 17-252	MN ST LINE RAD LEVEL	M	H	H	H	2	
T 12	11	18-51I	EAST CRD MODULE AREA MON	M	H	H	L	2	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 12	11	18-51J	WEST CRD MODULE AREA MON	M	H	H	L	2	
T 12	11	18-51L	HPCI TURBINE AREA MON	M	H	H	L	2	
T 12	11	18-51N	RCIC EQUIPMENT AREA MON	M	H	H	L	2	
T 12	11	18-51P	EAST CORE SPRAY & RHR AREA MON	M	H	H	L	2	
T 12	11	18-51Q	WEST CORE SPRAY & RHR AREA MON	M	H	H	L	2	
T 12	37	(APRM CL1:METER)	APRM CHANNEL 1:METER	M	H	M	M	3	
T 12	37	(APRM CL2:METER)	APRM CHANNEL 2:METER	M	H	M	M	3	
T 12	37	(APRM CL3:METER)	APRM CHANNEL 3:METER	M	H	M	M	3	
T 12	37	(APRM CL4:METER)	APRM CHANNEL 4:METER	M	H	M	M	3	
T 12	37	(APRM CL5:METER)	APRM CHANNEL 5:METER	M	H	M	M	3	
T 12	37	(APRM CL6:METER)	APRM CHANNEL 6:METER	M	H	M	M	3	
T 12	37	(LPRM G1:METER)	LPRM G1:METER)	M	H	M	M	3	
T 12	37	(LPRM G2:METER)	LPRM G2:METER)	M	H	M	M	3	
T 12	37	(RBM CL7:METER)	RBM CHANNEL 7:METER	M	H	M	M	3	
T 12	37	(RBM CL8:METER)	RBM CHANNEL 8:METER	M	H	M	M	3	
T 12	24B	(MANOMETER)	RX BLDG NEG PRESSURE	M	H	M	H	2	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 12		A review of the displays listed in the task analysis revealed that all required parameters can be read either on the instrument or SPDS to the proper precision with the exception of torus level. Torus level indication will be upgraded to provide the proper precision.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 13	6.5.1.2(b)	METERS, RECORDERS	All displays should indicate values in a form immediately usable by the operator without requiring mental conversion.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 13	3	PLR 7251A	DW RAD/TORUS LVL/DW PRESS	M	H	H	L	2	A
T 13	21	TR 23-115	TORUS AIR TEMP	M	H	H	H	2	A
T 13	257	RI 7858A	STACK GAS RAD MON	M	H	H	H	2	A
T 13	257	RI 7859A	RX BLDG VENT RAD MON CH A	M	H	H	H	2	A
T 13	258	RI 7858B	STACK GAS RAD MON	M	H	H	H	2	A
T 13	258	RI 7859B	RX BLDG VENT RAD MON CH B	M	H	H	H	2	A
T 13	7	PR 1264	CONDENSER VACUUM	M	H	H	M	2	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 13	A	Monticello feels that these instruments display value forms that are immediately usable by the operator. No corrective actions are planned.					X		
T 13	B	This device will be modified to read out in a directly usable form.	X						

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 14	6.5.2.1(d)	METERS, RECORDERS	Scale ranges should be selected to span the expected range during operation, use ranging techniques, or have alternate wide ranges

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 14	3	PI 23-111	TURBINE STEAM INLET INDICATOR	L	H	H	L	3	A
T 14	3	PI 23-112	TURBINE EXHAUST	L	H	H	L	3	A
T 14	4	PI 13-94	STEAM SUPPLY	L	M	H	L	4	A
T 14	4	PI 13-95	TURBINE DISCH	L	M	H	L	4	A
T 14	5	LI 1166	STBY LIQ CONT TK LEVEL	L	H	H	H	3	B
T 14	5	PI 6-90A	REACTOR PRESS A	L	H	H	M	3	B
T 14	5	PI 6-90B	REACTOR PRESS B	L	H	H	M	3	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 14	A	A review of the list of components for this HED found the range of measurement of these instruments to be acceptable for the values required by the EOPs.					X		
T 14	B	The components listed in this HED will be redesigned to span the range of measurement required by the EOPs.		X					

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 15	6.5.1.2(f)	METERS	Display dynamic sensitivity should be selected to minimize the display of normal random variation in equipment performance.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 15	3	FIC 23-108A	TURBINE SPEED	L	H	H	M	3	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 15		Monticello engineering advises that the rapid changes that may appear in the indicated flow are when the system is given a fast start for testing purposes. The flow changes observed during steady state operation are acceptable.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 16	6.5.3.1(c)	LIGHTS	System equipment status should be shown by illuminated indicators, never by the absence of illumination.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTGRS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 16	5	11A-DS1A	PUMP RUNNING 11-2A	L	H	H	H	3	A
T 16	5	11A-DS1B	PUMP RUNNING 11-2B	L	H	H	H	3	A
T 16	5	(RPIS FULL CORE DIS)	ROD POSITION INDICATORS	L	H	H	H	3	B
T 16	5	DS1B	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1C	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1D	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1E	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1F	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1G	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B
T 16	5	DS1H	CONTROL ROD DRIVE SCRAM SOLENOID	L	H	H	H	3	B

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 17	6.5.3.1(d)	LIGHTS	Indicators should not be used as annunciators to alert the operator of unfavorable status.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 17	3	C03-B-54	CONT.SPRAY PERMISSIVE PS-10-119B	L	L	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 17		This HED will be addressed in the overall alarm system review process.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 18	6.6.3.8(c)	SWITCH	Control position labels should be visible during operation of the control.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 18	2	17-154	OFFGAS RAD LEVEL	L	L	M	M	5	
T 18	10	17-151	OFF GAS RAD LEVEL	L	L	M	L	5	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 18		These problems will be addressed during the relabeling project.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 19	6.6.3.2(a)		The words used in a label should express exactly the intended action.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 19	3	C03-A-07	HPCI STEAM LINE HI DIF PRESS	L	M	H	L	4	
T 19	3	C03-A-41	A C INTERLOCK	L	M	M	L	4	
T 19	4	16A-S17	CLEANUP SYS ISOL V-12-68 \OUTLET	L	M	H	H	4	
T 19	4	C04-A-05	RCIC STEAM LINE HI DIF PRESS	L	M	H	H	4	
T 19	4	LI 2996	SUPPR CHAMBER LEVEL	L	M	H	M	4	
T 19	4	PI 13-94	STEAM SUPPLY	L	M	H	L	4	
T 19	4	TI 12-137	CLEANUP SYSTEM	L	M	M	L	4	
T 19	5	(POS CV-3-32A)	CONTROL FOR CV-3-32A	L	M	H	M	4	
T 19	5	(POS CV-3-32B)	CONTROL FOR CV-3-32B	L	M	H	M	4	
T 19	5	(POS CV-3-32C)	CONTROL FOR CV-3-32C	L	M	H	M	4	
T 19	5	(POS CV-3-32D)	CONTROL FOR CV-3-32D	L	M	H	M	4	
T 19	5	16A-S33	ISOL VALVE RESET	L	M	H	L	4	
T 19	5	5A-S1	REACTOR MODE RPS/PCIS	L	M	H	H	4	
T 19	5	C05-A-39	ATWS CH A PB ARMED	L	M	H	H	4	
T 19	5	C05-A-40	ATWS CH B PB ARMED	L	M	H	H	4	
T 19	6	HS-1133	MO 1133-B1207 AFW CV BLOCK VLV	L	M	M	M	4	
T 19	6	HS-1134	MO 1134-B1231 BFW CV BLOCK VLV	L	M	M	M	4	
T 19	8	DG1/CS	NO.11 DIESEL GEN CONTROL	L	M	H	M	4	
T 19	8	DG2/CS	NO.12 DIESEL GEN CONTROL	L	M	H	M	4	
T 19	25	8033J	V-D-16 DISCH DAMPER POS (V-RF-1)	L	M	H	M	4	
T 19	25	8033L	V-D-18 DISCH DAMPER POS (V-RF-2)	L	M	H	M	4	
T 19	25	8033N	V-D-20 DISCH DAMPER POS (V-RF-3)	L	M	H	M	4	
T 19	25	8033Q	V-D-22 DISCH DAMPER POS (V-RF-4)	L	M	H	M	4	
T 19	25	HS 8034I	V-RF-1 DISCH DAMPER POS [V-D-15]	L	M	H	M	4	
T 19	25	HS 8034K	V-RF-2 DISCH DAMPER POS [V-D-17]	L	M	H	M	4	

COMPONENT IDENTIFICATION AND HED ASSESSMENT (CONT.)

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 19	25	HS 8034M	V-RF-3 DISCH DAMPER POS [V-D-19]	L	M	H	M	4	
T 19	25	HS 8034P	V-RF-4 DISCH DAMPER POS [V-D-21]	L	M	H	M	4	
T 19	24A	(TEST)	SBGT TEST	L	M	H	M	4	
T 19	24A	C24A-01	SBGT UNIT A RUNNING	L	M	H	M	4	
T 19	24B	C24B-01	SBGT UNIT B RUNNING	L	M	H	M	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 19		Monticello will assign an engineer to review the labels and ensure that they clearly express the intent of the action in the EOPs.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 21	6.3.1.1		Annunciators should be used to alert operators of an out-of-tolerance condition--not for status indication, i.e. system activation

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 21	3	C03-B-54	CONT.SPRAY PERMISSIVE PS-10-119B	L	M	H	M	4	
T 21	5	5A-S3A	REACTOR SCRAM A	L	M	H	H	4	
T 21	5	C05-A-31	ATWS CH A TRIP	L	M	H	H	4	
T 21	5	C05-A-39	ATWS CH A PB ARMED	L	M	H	H	4	
T 21	5	C05-A-40	ATWS CH B PB ARMED	L	M	H	H	4	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 21		Monticello will review and resolve these problems as part of the alarm system review.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 22	6.1.1.1(b)		Operators should not have to leave the primary operating area to attend CR instruments during critical, continuous monitoring.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 22	16	(TEST SWITCHES)	CONTROL ROD TEST SWITCHES	M	M	M	L	4	A
T 22	21	TI 12-138	STEAM LEAK INDICATOR	M	M	H	M	4	B
T 22	21	TR 2-166	SAFETY & BLOWDOWN VALVES	M	M	H	M	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 22	A	These controls are used for special tests which are usually performed with the reactor in the shutdown mode. No corrective actions are planned.					X		
T 22	B	All available instrumentation cannot be located on panels in the primary operating area. Monticello feels that the location of these devices is acceptable. If practicable, this information will be provided by the SPDS computer.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 23	6.5.2.2(b)	METERS, RECORDERS	Pointers should be mounted to avoid parallax errors.

COMPONENT IDENTIFICATION AND HED ASSESSGMENT

HED CODE	PANEL	INSTRUMENT NUMBER	CONPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 23	7	PC 1246	11 SJAE PRESS CONTROL	L	M	M	M	4	A
T 23	7	PC 1247	12 SJAE PRESS CONTROL	L	M	M	M	4	A
T 23	10	17-357A	DISCHARGE CANAL MONITOR A	L	M	H	H	4	A
T 23	10	17-357B	DISCHARGE CANAL MONITOR B	L	M	H	H	4	A
T 23	5	FLR 6-96	RX VESSEL LVL/TOTAL FW FLOW	L	M	H	M	4	B

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 23	A	A review of the instruments revealed that no parallax problems exist for the components listed in this HED.							
T 23	B	Recorder FLR 6-96 does have parallax problems and the pointer obscures the instrument scale. This problem will be addressed along with the other recorders and indicators exhibiting similar problems.							X

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 24	6.5.1.4(k)	METER, RECORDER	Recorder design should allow data to be viewed through the window without opening the door.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT- INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 24	4	TR 2-167	RECIRC TEMPERATURES		M			C	
T 24	5	LI 2-3-85A	RPS LEVEL		M			C	
T 24	5	LI 2-3-85B	RPS LEVEL		M			C	
T 24	7	PI 1511	TURB BRG OIL HDR PRESSURE					C	
T 24	7	PI 1514	TURBINE OPER OIL PRESS					C	
T 24	248	(MANOMETER)	RX BLDS NEG PRESSURE					C	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 24		Monticello will review the options for presenting the recorder legend on multipoint recorders so that the data is not blocked. The convention spec shows an option for locating this information to prevent the window being blocked.							X

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HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 25	6.1.2.5		Controls should be placed 34 - 70 in. from the floor. Displays should be placed between 41 and 70 in. from the floor.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 25	10	17-357A	DISCHARGE CANAL MONITOR A	L	H	H	H	3	A
T 25	10	17-357B	DISCHARGE CANAL MONITOR B	L	H	H	H	3	A
T 25	11	18-51U	CONDENSATE SYSTEM AREA MON	L	H	H	L	3	A
T 25	11	18-51V	FEEDWATER PUMP AREA MON	L	H	H	L	3	A
T 25	11	18-51W	RADWASTE CONTROL ROOM AREA MON	L	H	H	L	3	A
T 25	11	18-51X	SAMPLE TANK AREA MON	L	H	H	L	3	A
T 25	11	18-51Y	CONVEYOR OPERATING AREA MON	L	H	H	L	3	A
T 25	11	18-51Z	MACHINE SHOP AREA MON	L	H	H	L	3	A
T 25	24B	(MANOMETER)	RX BLDG NEG PRESSURE	L	H	H	H	3	B
T 25	21	TI 12-138	STEAM LEAK INDICATOR	L	H	H	M	3	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 25	A	Monticello will provide this information on the SPDS system. No other corrective actions are planned.					X		
T 25	B	Monticello will not relocate this manometer. This is one of six such devices that provide this information. The other five manometers are located in the reactor building.					X		

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RESOLUTION DESCRIPTION (CONT.)

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 25	C	No corrective action is planned for this indicator.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 26	6.5.1.1(b)		Visual displays should give operators all the information about system status and parameters values that is needed.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 26	8	V-7	16 BUS	H	H	M	M	1	

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 26		Monticello will provide this information from SPDS.					X		

HUMAN ENGINEERING DISCREPANCY SUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 26	6.B.1.2		Panel layout should be effective in showing system relationships or task sequences.

COMPONENT IDENTIFICATION AND HED ASSESSMENT

HED CODE	PANEL	INSTRUMENT NUNBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 28	4	PI 13-94	STEAM SUPPLY	L	M	H	L	4	A
T 28	4	PI 13-95	TURBINE DISCH	L	H	M	L	4	A
T 29	4	PR 2994	DRYWELL & SUPPR CHBR PRESS	L	M	H	M	4	B
T 26	5	PI 6-90A	REACTOR PRESS A	L	M	H	M	4	B
T 28	5	PI 6-90B	REACTOR PRESS B	L	M	H	H	4	B
T 25	6	152-305/CS	CIRCULATING WATER PUMP P-100A	L	M	H	M	4	B
T 26	5	S5A	ATWS A MAN	L	M	H	N	4	C
T 25	5	S5B	ATWS B MAN	L	M	H	M	4	C
T 28	5	S5C	ATWS C MAN	L	N	H	M	4	C
T 28	5	S5D	ATWS D MAW	L	N	H	M	4	C

RESOLUTION DESCRIPTION

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 28	A	Monticello will move the PI 13-94 and PI 13-95 indicators adjacent to each other for improved operations.	X						
T 28	B	Monticello feels that the arrangement of these devices is acceptable. No corrective actions are planned.					X		

HED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUGTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 2G	C	The mirror imagery arrangement of these controls will be corrected. The A-C and B-D numbering sequence involves the normal numbering sequence within the reactor protection system. No corrective action to this numbering sequence is planned.	X						

HUMAN ENGINEERING DISCREPANCY GUMMARY REPORT

HED CODE	NUREG 0700 GUIDELINE	COMPONENT TYPE	HED DESCRIPTION
T 30	6.3.1.2(c)	ANNUNCIATOR	Annunciators with inputs from more than one plant parameter setpoint should be avoided.

COMPONENT IDENTIFICATION AND HED ASGESSMENT

HED CODE	PANEL	INSTRUMENT NUMBER	COMPONENT LABEL	DOCUM. EVENT-INTERV.	HUMAN FACTORS	PLANT SAFETY	PLANT OPERA	PRIORITY (SUMMARY SCORE)	CORRECTION CODE
T 30	6	C06-A-31	COND E-1B HOTWELL HIGH & LOW LEV	L	H	N	M	3	

RESOLUTION DESCRIPTION

MED CODE	CORRECTN CODE	RESOLUTION DESCRIPTION/JUSTIFICATION	ENHANCE	REDESIGN	TRAIN	PROCED	NO CORRECT	ALREADY FIXED	PENDING
T 30		Monticello feels that this arrangement is acceptable. A level recorder is available in the immediate area where an operator can determine which condition exists. No corrective actions are planned.					X		

APPENDIX F
HUMAN ENGINEERING DISCREPANCY RESOLUTIONS FOR COMPONENTS NOT IN THE CONTROL ROOM (IDENTIFIED IN HED T-10)

1. ADS Timer: This timer will be provided. This timer informs the C.R. operator of the elapsed time on the ADS System 120 second timer.

2. Degraded Bus Voltage #15/16 4.16 KV Buses Annunciator: This annunciator will be provided. It may be provided as part of a status board for the Emergency Diesel Generators.

3. Annunciator: Loss of Bus Voltage #15/16 4.16 KV Buses
   Voltmeter: Voltmeter #15 and 16 4.16 KV Buses
   These annunciators will be provided. It may be provided as part of the Emergency Diesel Generator Status Boards.

4. Control: CRD-14, CRD Accumulator Charging Hdr Isol Valve
   This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

5. Control: CRD 30; CRD Sys Disch to RWCU Isol Valve.
   This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

6. Control: CRD-8, CRD Pump Test Bypass Valve Isol Valve
   This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

7. Control: CRD Bypass Injection to Vessel: (CRD-8)
   This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

8. Control: CRD Test Bypass: (CRD-8)
   This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

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9. Control: CRD Injection Via RWCU
This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

10. Control: CRD-14, CRD Accumulator Charging Hdr Isol Valve
This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

11. Speed Indicator: #11 Emergency Diesel Generator Speed Indication
Speed Indication will be provided for both #11 and #12 Emergency Diesel Generators on Pnl C-08.

12. Speed Indicator: #12 Emergency Diesel Generator Speed Indication
Speed Indication will be provided for both #11 and #12 Emergency Diesel Generators on Pnl C-08.

13. Control: V-D-10, Rx Bldg Ventilation Isolation Damper
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

14. Control: V-D-11 Rx Bldg Ventilation Isolation Damper
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

15. Control: V-D-12
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

16. Control: V-D-13
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

17. Control: V-D-14
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

18. Control: V-D-23
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

19. Control: V-D-24
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

20. Control: V-D-25
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

21. Control: V-D-26
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

22. Control: V-D-7
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

23. Control: V-D-8
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

24. Control: V-D-9
Position Indicator: Controls and position indication of this damper will not be provided. This damper automatically closes when appropriate Rx Bldg Ventilation Isolation signals are initiated. This damper can be closed along with all other Rx Bldg Ventilation Isolation dampers manually by the C.R. operator by depressing switches located on Panel C-24A & B. The C.R. operator can determine that all isolation dampers have closed by monitoring SGTS flow and Rx Bldg pressure.

25. Control: Bypass APRS Auto Initiation Jumper BB 31 and BB58
This capability has been provided by the completion of an ADS design change that provided ADS inhibit switches on Panel C-03.

26 Alarm: Area High Water Level
After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water can not accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

27. Alarm: Condenser E1B Low Level
This annunciator is presently provided on a dual high/lo level alarm on window C-06 A-31. This situation was found to be acceptable because of the availability in the immediate area of Condenser Level indication where the C.R. operator could readily determine which condition existed, high or low level.

28. Alarm: Condensate Storage Tank #12 Level (8')
A number of alarms are available in the Control Room for Condensate Storage Tanks Level alarms.
C06-B-1 Cond. Stor. T-1A High Level - 24'
C06-B-2 Cond. Stor. T-1B High Level - 24'
C06-B-7 Cond. Stor. T-1A Low Level - 11'6"
C06-B-8 Cond. Stor. T-1B Low Level - 11'6"
C06-C-32 CST Low, Low Level and Minimum Level 7'
It was decided that the setpoints of the existing CST level alarm were acceptable in view of the fact that level indicators were available in close proximity to these alarms.

29. Alarm: Condensate Storage Tank #12 Low Low Level
A number of alarms are available in the Control Room for Condensate Storage Tanks Level alarms.
C06-B-1 Cond. Stor. T-1A High Level - 24'
C06-B-2 Cond. Stor. T-1B High Level - 24'
C06-B-7 Cond. Stor. T-1A Low Level - 11'6"
C06-B-8 Cond. Stor. T-1B Low Level - 11'6"
C06-C-32 CST Low, Low Level and Minimum Level 7'
It was decided that the setpoints of the existing CST level alarm were acceptable in view of the fact that level indicators were available in close proximity to these alarms.

30. Alarm: Rx Bldg Equip Drain Sump Water Level
Level Indicator: An annunciator is provided for this sump and the sump it overflows into the Rx Bldg floor drain sump, outside of the C.R. in the Radwaste Bldg Control Room. These sumps are located in a room that will be provided with a high water level alarm, see item #26. It was decided that level indication in these areas would not be provided because it was felt that little significant benefits would be gained by providing this indication.

31. Alarm: Rx Bldg Floor Drain Sump Water Level
Level Indicator: An annunciator is provided for this sump and the sump it overflows into, the Rx Bldg Equip Drain Sump, outside the C.R. in the Radwaste Control Room. These sumps are located in a room, the HPCI Rm, that will be provided with a high water level alarm, see item #26. It was decided that level indication in these areas would not be provided because it was felt that little significant benefits would be gained by providing this indication.

32. Level Indicator: A RHR Room High Water Level
It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

33. Level Indicator: B RHR Room High Water Level
It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

34. Annunciator: HPCI Room High Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

35. Annunciator: RCIC Room High Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

36. Annunciator: RCIC Room High Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

37. Level Indicator: RHR A & B Room Level
It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

38. Annunciator: RHR A Room Water Level
Level Indicator: An Annunciator is provided. It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

39. Annunciator: RHR A & B. Cont Spray Hdr Water Level
Level Indicator: An Annunciator is provided. After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

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40. Annunciator: RHR B Injection Room Water Level
Level Indicator: An Annunciator is provided. After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

41. Annunciator: RHR B Injection Room Water Level
Level Indicator: An Annunciator is provided. It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

42. Annunciator: RHR Room A Water Level
Level Indicator: An Annunciator is provided. It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

43. Annunciator: RHR Room B Water Level
Level Indicator: An Annunciator is provided. It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

44. Annunciator: RHR Room B Water Level
Level Indicator: An Annunciator is provided. It has been decided not to provide level indication in this area. The level alarm and pump running indicating lights were determined to provide the C.R. operator with acceptable information on the operational status of equipment in this room.

45. Annunciator: RWCU Area Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. An Annunciator and level indication will not be provided because little significant benefit would be gained by providing it.

46. Annunciator: Rx Building Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. An Annunciator and level indication will not be provided because little significant benefit would be gained by providing it.

47. Level Indicator: Scram Discharge Volume Level
It was decided that no significant benefit would be gained by providing level indication of the Scram Discharge Volume. A number of annunciators are provided to inform the C.R. operator of the water level of this device. In addition, switches on this device initiate other automatic actions as designed to ensure the safety of the plant is not jeopardized.

48. Annunciator: Shutdown Cooling Piping Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. An Annunciator and level indication will not be provided because little significant benefit would be gained by providing it.

49. Annunciator: Steam Chase Room Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. An Annunciator and level indication will not be provided because little significant benefit would be gained by providing it.

50. Annunciator: Torus Area Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

51. Annunciator: Torus Area Water Level
Level Indicator: After review of the layout of the Rx Bldg it was decided that this function should be provided for the following areas, HPCI Room, RCIC Room, Torus Room, A RHR Room and the B RHR Room. This function is presently provided in A and B RHR Rooms. The basis for selecting these locations was the fact that significant quantities of water cannot accumulate in any other area of the Rx Bldg. Floor drains and other building design characteristics will direct any spills to these areas eventually. Level indication will not be provided because little significant benefit would be gained by providing it.

52. Annunciator: 30% of 1st Stage Pressure
Pressure Indicator: This information is provided by the following alarms and pressure indicator, Annunciator C05-B-36, C05-B-37 and Pressure Indicator PI-1625.

53. Control: AI-15, Instrument Air Isolation Valve to CRD
Pressure Indicator: It has been decided not to provide these functions for this valve for the following reason. An alarm, CO5-B-22 Scram Pilot Hdr Hi/Lo Press is provide to inform the C.R. operator of the status of the air pressure in this header. Three redundant solenoids that have the capability to isolate this air supply provide reasonable assurance that the need to isolate this valve will be very unlikely.

54. Control: FW-44 Manual Makeup to Main Condenser
It has been decided not to provide control of this valve in the Control Room for the following reason: LC1094 located in the C.R. controls 2 valves that control makeup of water to the Condenser from the Condensate Storage Tanks. It is very unlikely that both of these valves would fail.

55. Control: Condensate/Feedwater Flow Controller
This control capability is provided by the following valves and their associated controllers

CV-6-13	LC 6-85	
CV-6-12A	LC 6-84A	Master Controller 6-83
CV-6-12B	LC 6-84B	

56. Control: Condensate Service Water Pressurizing System for
Flow Indicator: RHR and Core Spray Systems
It has been decided not to provide these functions for the following reasons. Many other emergency capabilities exist to makeup water to the Rx besides the Emergency Core Cooling System. This method of makeup water to the Rx has a very limited rate of coolant addition. It is felt that very little benefit would be gained by providing these capabilities.

57. Control: Remote Control of CST-101, Press Control PCV-2458 Bypass Valve
It has been decided not to provide this capability for the following reasons. Many other emergency capabilities exist to makeup water to the Rx. This method of makeup water to the Rx has very limited rate of coolant addition. It is felt that very little benefit would be gained by providing this capability.

58. Control: Remote Control of CST-101-2, Press Control PCV-2459 Bypass Valve
It has been decided not to provide this capability for the following reasons. Many other emergency capabilities exist to makeup water to the Rx. This method of makeup water to the Rx has very limited rate of coolant addition. It is felt that very little benefit would be gained by providing this capability.

59. Control: CRD Drive Water Diff Press Control (MO3-20)
This capability is provided by MO3-20, HS 3B-S2

60. Control: CRD HCU Charging Water Header Valve CRD-14
This control will not be provided. Remote operation of this valve would only be required under extremely deteriorated plant condition. The benefits to be gained by providing a remote operator would not justify the expenses to provide this capability.

61. Annunciator: CRD Scram Valve Air Header Low Air Pressure
Pressure Indicator: It was decided not to provide this annunciator and pressure indicator to inform the C.R. operator that the scram solenoids have performed their function of venting this header of all air pressure. It was felt that existing instrumentation adequately inform the C.R. operator of the reason for the failure of the RPS to insert the controls rods.

62. Flow Indicator: High HPCI Steam Flow
It has been decided not to provide this information to the C.R. operator. Existing annunciator CO3-A-7 high steam flow will result in auto isolation of this system. No significant benefit can be gained from installing this flow indicator.

63. Annunciator: HPCI Steam Line Low Pressure
This annunciator will be provided by the SPDS system.

64. Indicator: LPCI Initiation Sealed In
It has been decided that this indication is adequately provided by annunciator CO3-A-49, RHR A Timer Activated and CO3-B-51 RHR B Timer Activated.

65. Indicator: Oil Pumps Running, RFP Aux Oil Pumps
This information is provided by the control switches for #11 and 12 RFP Aux Oil Pumps on panel C-06
#11 RFP Aux Oil Pump HS 1243
#12 RFP Aux Oil Pump HS 4243

66. Control: POS 1532 Service Water Makeup to the Main Condenser Isol Valve (SW-147)
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

67. Control: POS 1533 Service Water Makeup to the Main Condenser Isol Valve (SW-145)
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

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68. Annunciator: Primary Containment Hydrogen Concentration
Trend (Recorder): This information is provided by the Primary Containment Hydrogen Concentration Monitors.
AR 4018A - Panel C-259
AR 0418B - Panel C-260

69. Annunciator: RCIC Steam Line Low Pressure
This annunciator will be provided by the SPDS System.

70. Control: Rx Recirc Pump A Speed Control
This control is provided by #11 - Rx Recirc MG Speed Controller.
2-184-16A #11 Rx Recirc MG.

71. Control: Rx Recirc Pump B Speed Control
This control is provided by #12 - Rx Recirc MG Speed Controller.
2-184-16B #12 Rx Recirc MG.

72. Trend (Recorder): Control Rod Position Indication
It has been decided not to provide this recorder. A trend of the position of all 121 control rods would be very hard to provide, it would require a number of mult-point recorders. In addition, the position information from the RPIS system is not an analog signal such as would be desirable for a trend of control rod position.

73. Control: Scram Air Header Vent Valve
It has been decided not to provide this valve and control. The scram solenoids and provide reasonable assurance that the scram air header will be depressurized and manual opening of the air header coupling will not be necessary.

74. Annunciator: Secondary Containment Diff Pressure

An annunciator will be provided to alert the control room operator of the Low Reactor Building Differential Pressure condition.

75. Annunciator: Radiation Release
This capability is provided by annunciators associated with the following Radiation Monitors
RI 7858A Stack Wide Range Radiation
RI 7858B Monitors
Alarm 259-A-1 Stack Effluent High High Radiation
RI 17-351 Service Water Radiation Monitor
Alarm 4-A-23 Liquid Process High Radiation
RI 17-452A Rx Bldg Exch Plenum Radiation
RI 17-452B Monitors
Alarm 3-B-55 Rx Bldg Ex Plenum High Rad.
Alarm 5-A-1 Rx Bldg Vent Fuel Pool Hi/Lo Rad Ch A
Alarm 5-B-2 Rx Bldg Vent Fuel Pool Hi/Lo Rad Ch B
RI 7859A Rx Bldg Vent Wide Range Rad Monitors
RI 7859B
Alarm RBV Effluent Hi Hi Radiation

76. Annunciator: RHR B Injection Room High Radiation
Radiation Indicator: It has been decided that these functions will not be provided in the Control Room. The benefits of providing this information do not justify the cost for providing the information. Whether or not a high radiation condition exists in this area will not have a significant effect on operator actions regarding operation of equipment in the area in an emergency. In fact under some emergency operating conditions, high radiation in this area would be expected.

77. Annunciator: RHR B Injection Room High Radiation
Radiation Indicator: It has been decided that these functions will not be provided in the Control Room. The benefits of providing this information do not justify the cost for providing the information. Whether or not a high radiation condition exists in this area will not have a significant effect on operator actions regarding operation of equipment in the area in an emergency. In fact under some emergency operating conditions, high radiation in this area would be expected.

78. Annunciator: RWCU Area Radiation Monitor
Radiation Indicator: It was decided that these functions will not be provided in the Control Room. The benefits of providing this information do not justify the cost. Significant radiation dose exists in this area during normal operation. Whether or not a high radiation conditon exists in this area will not have a significant effect on operator actions regarding operation of equipment in the area in an emergency. In fact under some emergency operating conditions very high radiation in the area would be expected.

79. Annunciator: RHR Shutdown Cooling Piping Area
Radiation Indicator: Radiaton Monitors
It has been decided that these functions will not be provided in the Control Room. The benefits of providing this information do not justify the cost for providing the information. Whether or not a high radiation condition exists in this area will not have a significant effect on operator actions regarding operation of equipment in the area in an emergency. In fact under some emergency operating conditions, high radiation in this area would be expected.

80. Trend (Recorder): Spend Fuel Pool Rad Monitors

It as been decided not to provide a Trend Recorder for these monitors. These monitors initiate annunciator on the Main Control Panel. Trip indicating lights on the instrument that must be manually reset inform an operator of a situation where a trip signal was generated and conditions have returned to near normal or normal condition.

81. Annunciators: Steam Chase Room Radiation Monitors
Radiation Indicator: This information is provided by the Main Steam Line Radiation Monitors
RI 17-251 A
RI 17-251 B
RI 17-251 C
RI 17-251 D
Alarm C03-B-8 Main Steam Line High Radiation.

82. Annunciator: Torus Room Radiation Monitor
Radiation Indicator: It has been decided that these functions will not be provided in the Control Room. The benefits of providing this information do not justify the cost for providing the information. Whether or not a high radiation condition exists in this area will not have a significant effect on operator actions regarding operation of equipment in the area in an emergency. In fact under some emergency operating conditions, high radiation in this area would be expected.

83. Control: #11 RFP Oil
This control is provided on Panel C-06 HS-1243 #11 RFP Aux Oil Pump Control SW.

84. Control: #12 RFP Oil
This control is provided on Panel C-06 HS-4243, #12 RFP Aux Oil Pump Control SW.

85. Indicator: RFP Suction Pressure
This information is provided.
PI 1120 - #11 RFP Suction Pressure
PI 1121 - #12 RFP Suction Pressure

86. Control: CS/RHR W/Cond SW Pumps Remote Control of CST 101-2 PCV 2459 Bypass Valve
It has been decided not to provide this capability for the following reasons. Many other emergency capabilities exist to makeup water to the Rx. This method of makeup water to the Rx has very limited rate of coolant addition. It is felt that very little benefit would be gained by providing this capability.

87. Control: RHR A Remote Control of CST 83, PCV 2992 Bypass Valve
It has been decided not to provide this capability for the following reasons. Many other emergency capabilities exist to makeup water to the Rx. This method of makeup water to the Rx has very limited rate of coolant addition. It is felt that very little benefit would be gained by providing this capability.

88. Pressure Indicator: RHR A Suction Pressure
It was decided not to provide this device. It was determined that the SPDS would adequately provide the needed information.

89. Control: RHR B, CST 101-2, Press Control PCV 2459 Bypass Valve
It has been decided not to provide this capability for the following reasons. Many other emergency capabilities exist to makeup water to the Rx. This method of makeup water to the Rx has very limited rate of coolant addition. It is felt that very little benefit would be gained by providing this capability.

90. Pressure Indicator: RHR B Suction Pressure
It was decided not to provide this device. It was determined that the SPDS would adequately provide the needed information.

91. Pressure Indicator: RHR Discharge Pressure
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

92. Pressure Indicator: RHR Pressure
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

93. Pressure Indicator: RHR Pressure #11
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

94. Pressure Indicator: RHR Pressure #12
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

95. Pressure Indicator: RHR Pressure #13
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

96. Pressure Indicator: RHR Pressure #14
It has been decided not to provide this indicator. Adequate instrumentation exists in the C.R. for a C.R. operator to determine if a RHR Pump(s) is performing or capable of performing its intended function.

97. Pressure Indicator: RHR Suction Pressure
It was decided not to provide this device. It was determined that the SPDS would adequately provide the needed information.

98. Control: RHRSW Crosstie Remote Operator for RHRSW 12, 13 and 14
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

99. Control: RHRSW Crosstie Remote Operator for RHRSW 12, 13 and 14
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

100. Control: RHR Service Water Crosstie
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

101. Control: RHR Service Water Valves
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

102. Control: RHR Service Water Cross Tie
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

103. Control: SBLC Boron. This involves alternate SBLC injection valves not identified.
It was decided not to provide these controls in the control room. The benefits of providing these controls would not justify the cost.

104. Control: SBLC Test
It was decided not to provide these controls in the control room. The benefits of providing these controls would not justify the cost.

105. Control: Service Water Crosstie to C/F (SW 147-POS 1532, SW146, SW-147-POS 1533
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

106. Flow Indicator: Service Water Flow
It was decided not to provide this indicator in the control room. The benefits of providing this indicator would not justify the cost.

107. Control: Service Water Crosstie to C/F
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

108. Control: SW 145
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

109. Control: SW 145
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

110. Control: SW 146
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

111. Control: SW 147
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

112. Control: SW 147
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

113. Control: SW Crosstie to C/F
It has been decided not to provide this control. The need to operate this valve is extremely unlikely. It is also very likely that C.R. operators would have time to anticipate the need to open this valve and that the valve would be accessible for operation.

114. Annunciator: RHR A & B Cont Spray Room Temp
Temp Indicator: It was decided not to provide an alarm and temperature indicator for this area. Temperature detectors, indicators and alarms have been provided for what is considered appropriate areas of the RHR system piping.

115. Annunciator: RHR A & B Cont Spray Room Temp
Temp Indicator: It was decided not to provide an alarm and temperature indicator for this area. Temperature detectors, indicators and alarms have been provided for what is considered appropriate areas of the RHR system piping.

116. Temp Indicator RHR B Inj Room Temp
It was decided not to provide an alarm and temperature indicator for this area. Temperature detectors, indicators and alarms have been provided for what is considered appropriate areas of the RHR system piping.

117. Temp Indicator: Shutdown Cooling Piping Area Temp
It was decided not to provide an alarm and temperature indicator for this area. Temperature detectors, indicators and alarms have been provided for what is considered appropriate areas of the RHR system piping.