MONTICELLO SIMULATOR CERTIFICATION REPORT

Docket Number: 50-263

January 1991

SIMULATOR CERTIFICATION REPORT

FOR THE MONTICELLO NUCLEAR GENERATING PLANT

SIMULATION FACILITY

Prepared By: _____ Date: 31 Jan 91

Reviewed By: _____ Date: 31 Jan 91

Approved By: _____ Date: 31 Jan 91

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MONTICELLO SIMULATOR CERTIFICATION REPORT

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MONTICELLO SIMULATOR CERTIFICATION REPORT

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I. **PURPOSE**:

The Monticello Nuclear Generating Plant Simulator Certification Report will document the performance of the Monticello plant specific simulator in accordance with the requirements provided in 10CFR55.45, Regulatory Guide 1.149 and ANS/ANSI 3.5-1985. The report is organized into specific sections and appendices describing the facility, Control Room/Simulator arrangement, instructor interface, simulator initial conditions, malfunctions, remote functions, operating procedures, Certification Review Group and simulator malfunction/performance test abstracts.

This initial report will be issued in January 1991 with annual followup reports describing all testing, simulator discrepancy resolutions and simulator modifications. Recertification will follow every four years from the date of this Initial Certification.

II. **FACILITY**: Monticello Nuclear Generating Plant
Unit No. 1

III. **LICENSEE**: Northern States Power Company
414 Nicollet Mall
Minneapolis, Minnesota 55440

IV. **SIMULATION FACILITY**:

A. Name and Location of Simulation Facility:

Monticello Simulator
Northern States Power Company
Monticello Training Center
2100 West River Street
Monticello, Minnesota 55362

B. Manufacturer:

The Singer Company
Link Simulation Systems Division
11800 Tech Road
Silver Spring, Maryland 20904

C. Date Available for Training:

February 24, 1984

V. **CONTROL ROOM/SIMULATOR ARRANGEMENT**:

A. Physical Arrangement:

The layout of the Control Room and the simulator control room with computer room are shown in Appendix #1.

V. CONTROL ROOM/SIMULATOR ARRANGEMENT (Cont'd)

B. The Scope of Simulation:

Equipment included in the simulator control room is listed in Appendix #2

C. Instructor Interface:

1. Location of Instructor Controls:

The primary location for controlling and monitoring the training simulator is the instructor's console located on an elevated platform in the back of the simulator room.

Simulator controls at the instructor station meets all ANSI/ANS 3.5-1985 requirements. They include are: Freeze/Run, Reset, Switchcheck Override, Snapshot, Fasttime, Slowtime, Record, Replay, Backtrack, Forward/Reverse, Annunciator Sound Silence, Lamp Acknowledge and Test, Recorder Power Off, Computer Alarm Silence, and Terminal for entering IC's, Malfunctions, Remote Functions, Overrides, etc.

A remote control hand-held device capable of freeze/run, reset, snapshot, malfunction insertion, backtrack, forward, reverse, replay, and alarm silence.

Emergency stop push buttons are located on the instructor's console and throughout the simulator room to de-energize the computer complex in an emergency situation.

2. Initial Conditions (IC's):

The Initial conditions (IC), ANSI/ANS 3.5-1985, Section 3.4.1 are listed in Appendix #3.

3. Malfunctions:

List of malfunction and assessment against requirements of ANSI/ANS 3.5-1985, Section 3.1.2 are included in Appendix #4.

4. Remote Functions:

Remote functions which simulate systems operated outside the Control room are listed in Appendix #5.

5. Special Instructor/Training Features:

In addition to those features required by ANSI/ANS 3.5-1985, the Monticello simulator also possesses additional features which are described in Appendix #6.

V.C. CONTROL ROOM/SIMULATOR ARRANGEMENT (Cont'd)

6. Simulator Operating Limits

As required by ANSI/ANS 3.5-1985, section 4.3 and in order to avoid negative training, the Monticello simulator has operating limit alarm lights to alert the simulator instructor of conditions that may be beyond modeling capabilities. The operating limits are monitored by software and, when exceeded, an appropriate alarm light at the instructor station is illuminated. This light will stay on until the simulator is reset. The operating limit parameters are:

a. Primary Containment Pressure
b. Reactor Pressure
c. Torus Water Temperature
d. Fuel Temperature

D. Operating Procedures

All operating procedures and drawing files available in the Control Room are also available in the Simulator Control Room. The documents are maintained and controlled in accordance with the Monticello Plant's control document distribution system. Operating Procedures available in the simulator are listed in Appendix #7.

E. Changes Since Last Report

This is initial certification, therefore changes since last report is not applicable.

VI. DESCRIPTION OF PERFORMANCE TESTING COMPLETED:

A. Factory acceptance test (ATP). June - November 1983. Customized test procedures written for all simulated systems; Malfunctions and physical fidelity were reviewed and tested by SRO licensed operators and Training personnel. The simulator was delivered with numerous open Discrepancies (DR's), all of which were corrected on site.

B. On-site acceptance testing was performed, following re-assembly, by SRO Licensed Operators and Training personnel January and February 1984.

1. Initial conditions - Cold shutdown re-verified.

2. A reactor and auxiliary systems start up from cold shutdown to 100% and shutdown from 100%.

3. All malfunctions were re-verified in accordance with the malfunction cause and effect.

VI. DESCRIPTION OF PERFORMANCE TESTING COMPLETED (Cont'd)

C. Initial ANSI/ANS 3.5-1985 tests.

1. Test abstracts for the following areas are attached (Appendix #8):

- Appendix "A" Computer real time.
- Section 3.2 and section 3.4 Simulator Environment and Panel Physical Fidelity.
- Appendix "B" B1.2(1) Manual Scram.
- Appendix "B" B1.2(2) Simultaneous Trip of all Feedwater pumps.
- Appendix "B" B1.2(3) Simultaneous Closure of all Main Steam Isolation Valves.
- Appendix "B" B1.2(4) Simultaneous Trip of all Recirculation pumps.
- Appendix "B" B1.2(5) Single Recirculation Pump Trip.
- Appendix "B" B1.2(6) Main Turbine Trip Transient Test.
- Appendix "B" B1.2(7) Maximum Rate Power Ramp (100% - 75% - 100%).
- Appendix "B" B1.2(8) Maximum size reactor coolant system rupture (LOCA) with Loss of all off-site power.
- Appendix "B" B1.2(9) Maximum size unisolable main steam line rupture.
- Appendix "B" B1.2(10) Simultaneous Closure of all main steam isolation valves combined with single stuck open safety relief valve.
- Appendix "A", A3.2 and section 3.1.1, Steady State and Normal Operation.
- ANSI/ANS 3.5 section 3.1.2 Malfunctions Acceptance Tests.

2. ANSI/ANS 3.5 sections 5.1, 5.2, and 5.3 Simulator Design, Updating and Modification Process Outlines (Appendix #11).

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VII. SIMULATION FACILITY PERFORMANCE TESTING SCHEDULE: (Appendix 13)

A. Annual Performance Tests (ANSI/ANS 3.5-1985)

1. Appendix "A", A3.1 Computer real time test.

2. Appendix "A", A3.2 Steady State and Section 3.1.1 Normal Operation.

3. Appendix "A", A3.3 Transient tests:

a. Appendix "B" B1.2(1) Manual Scram

b. Appendix "B" B1.2(2) Simultaneous Trip of all Feedwater pumps.

c. Appendix "B" B1.2(3) Simultaneous Closure of all Main Steam Isolation valves.

d. Appendix "B" B1.2(4) Simultaneous Trip of all Recirculation pumps.

e. Appendix "B" B1.2(5) Single Recirculation Pump Trip.

f. Appendix "B" B1.2(6) Main Turbine Trip Transient Test.

g. Appendix "B" B1.2(7) Maximum Rate Power Ramp (100% - 75% - 100%).

h. Appendix "B" B1.2(8) Maximum size reactor coolant system rupture (LOCA) combined with Loss of all off-site power.

i. Appendix "B" B1.2(9) Maximum size unisolable main steam line rupture.

j. Appendix "B" B1.2(10) Simultaneous Closure of all Main Steam Isolation Valves combined with single stuck open safety relief valve.

B. Four Year Simulator Test

1. Appendix "A", section A3.4 Malfunction tests.

a. All simulator malfunctions will be tested during the next four (4) years, (one quarter per year) starting with 1991, the first year following initial certification.

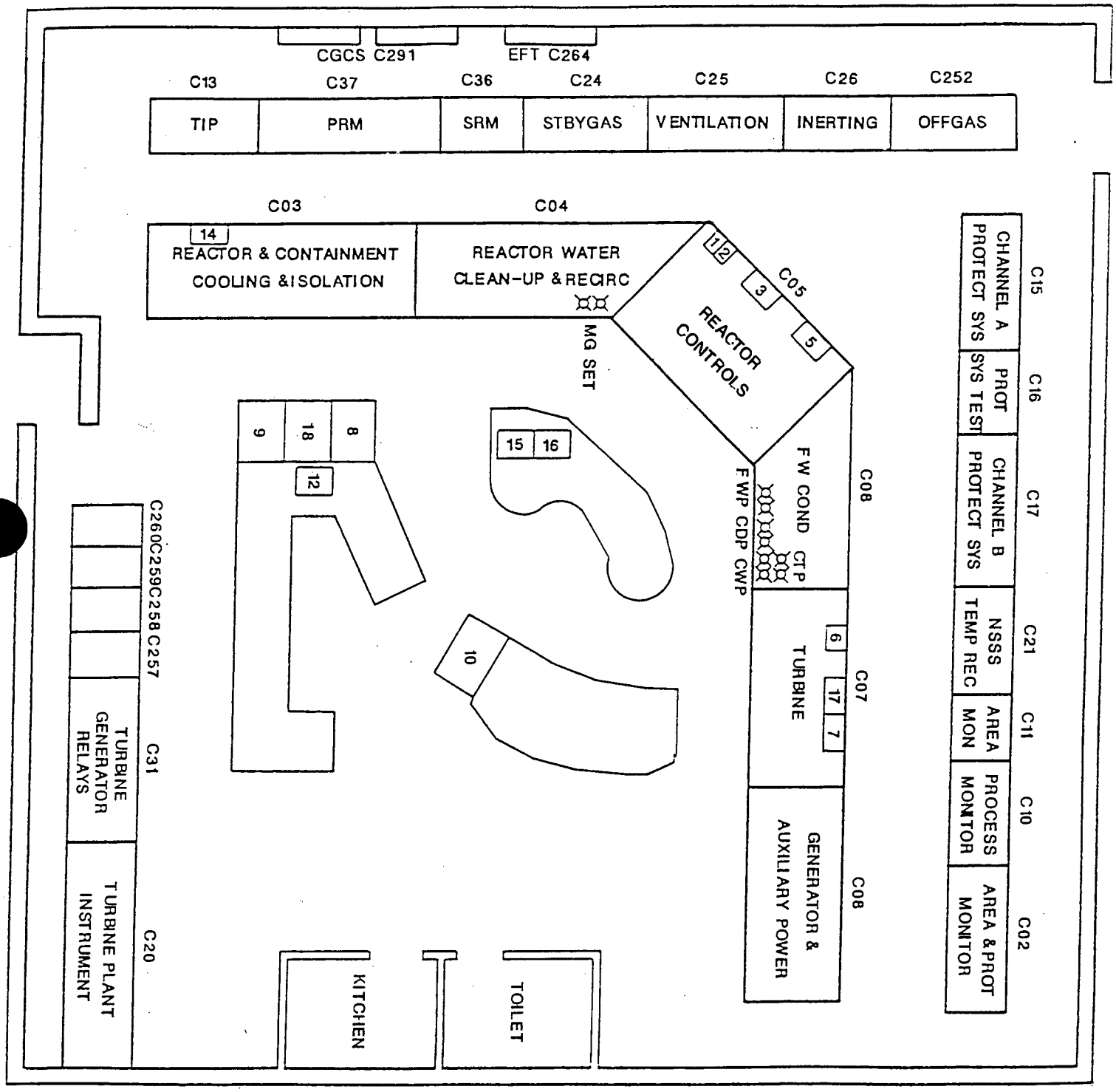
2. Section 3.2, Simulator Environment and Panel Physical Fidelity.

a. These tests will be conducted over the next four years at a rate of one quarter per year starting with 1991.

MONTICELLO SIMULATOR CERTIFICATION REPORT

MONTICELLO PLANT CONTROL ROOM

APPENDIX #1



MONTICELLO SIMULATOR CERTIFICATION REPORT

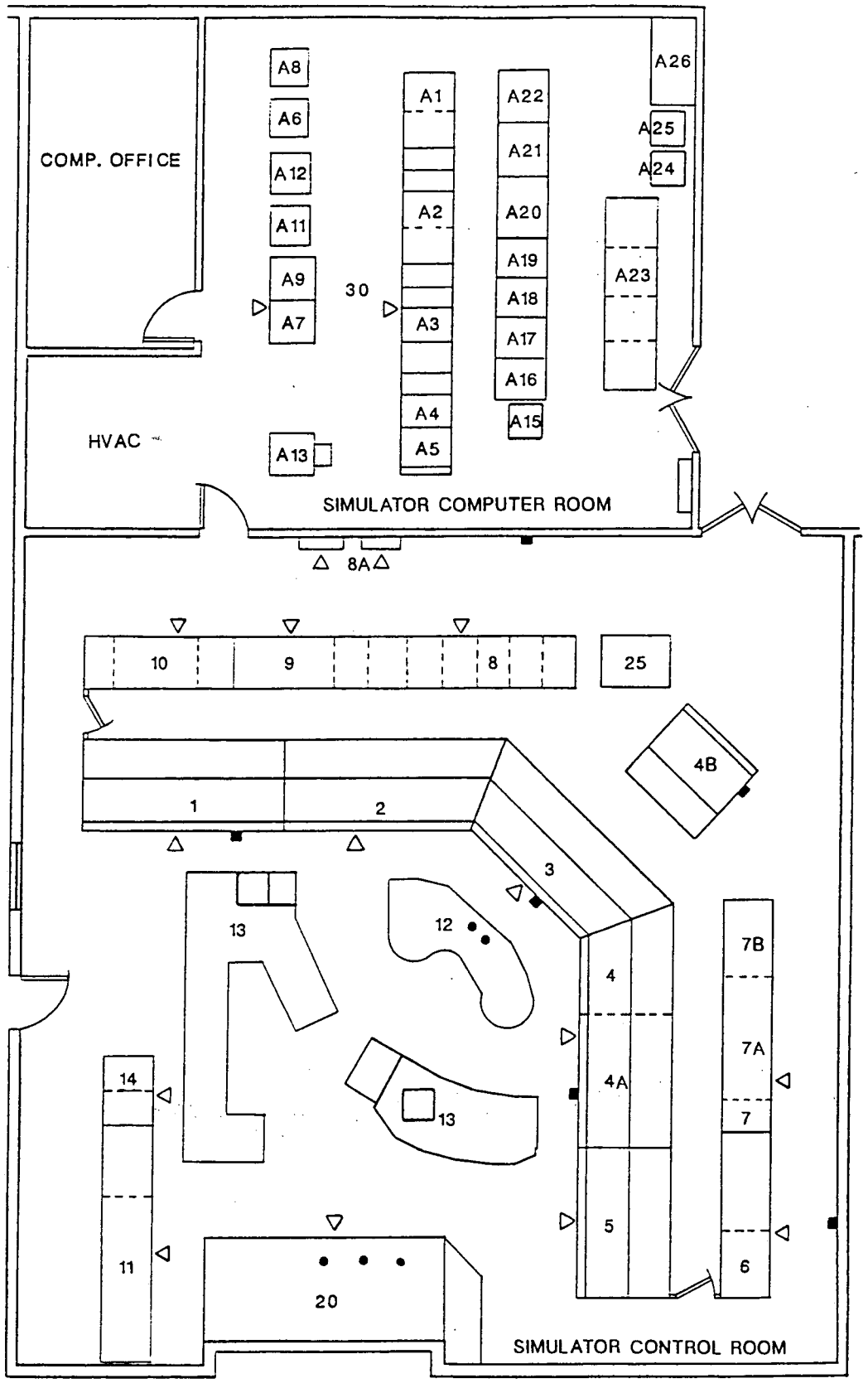
COMPUTER EQUIPMENT IN CONTROL ROOM
APPENDIX # 1

1	Trend Recorder 3 & 4
2	Trend Recorder 1 & 2
3	SPDS Display
5	SPDS Display
6	Trend Recorder 5 & 6
7	Turbine SU/SD Sequence Monitor
8	VAX
9	VAX Laser Printer
10	VAX
12	VAX VT220 Terminal
14	SPDS Display
15	SPDS Display
16	SPDS Display
17	SPDS Display
18	SPDS Hard Copy Display

MONTICELLO SIMULATOR CERTIFICATION REPORT

MONTICELLO TRAINING CENTER SIMULATOR

APPENDIX #1



△ DENOTES FRONT
■ DENOTES WALL MTD TELEPHONE
● DENOTES DESK TOP MTD TELEPHONE

MONTICELLO SIMULATOR CERTIFICATION REPORT

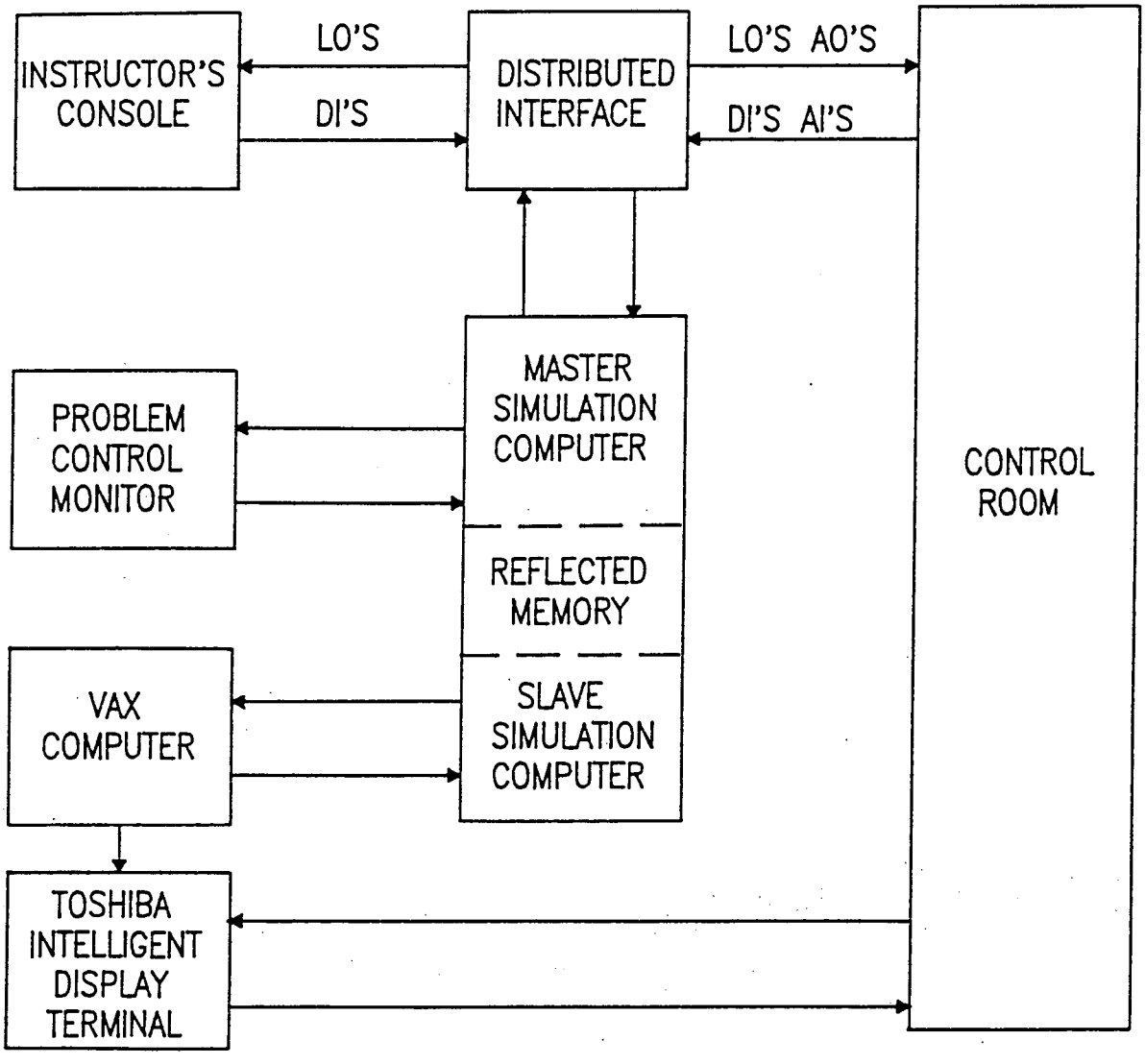
SIMULATOR UNIT DESIGNATION
APPENDIX # 1

Unit	Description
1	Reactor Core Cooling Benchboard C03
2	Cleanup and Cooling Benchboard C04
3	Reactor Control Benchboard C05
4	Feed and Condensate Benchboard C06
4A	Turbine Generator Benchboard C07
4B	Remote Shutdown Panel C292
5	Auxiliary Electrical Control Benchboard
6	Area Radiation Monitoring and Process C02 Radiation Monitoring Panel C10
7	Leak Detection and Temperature C21 Area Radiation Monitors
7A	Recorders Panel C21
7B	Single Rod Scram Panel C16
8	Off Gas Panels C252
8A	CGCS C 291
9	Standby Gas Treatment and C24 Drywell Cooling Panels C25
IO	Nuclear Instrumentation Special Panel C36, C37, C13
11	HVAC, Heater Drains, Diesel Fire Pump Panel, and C20 Recirculation Pump panels
12	Communication Console and SPDS Terminals C01
13	Plant Process Computer Operators Console
14	Wide Range Monitor C257, C259
20	Instructor's Console Video and Sound
25	Power Conditioner
30	Computer Complex

A1	Slave Computer
A2	Master Computer
A3	Tape Drives
A4	Peripheral Switch
A5	Master Controller
A6	Master Console
A7	Master TSM
A8	Slave Console
A9	Slave TSM
A11	Master Disk Drive
A12	Slave Disk Drive
A13	Line Printer
A15	VAX 785 Console
A16	VAX 785 Computer
A17	VAX 785 I/O Cabinet
A18	VAX 785 Tape Drive
A19	VAX 785 Disk Drive
A20	Hot Functional I/O Rack
A21	Spare Computer
A22	Spare Tape Drive
A23	Toshiba Display Computers
A24	Spare Line Printer
A25	Spare Disk Drive
A26	Spare Console

MAJOR COMPONENTS OF THE SIMULATOR

APPENDIX #1



MONTICELLO SIMULATOR CERTIFICATION REPORT
APPENDIX #2

THE SCOPE OF SIMULATION

1. Equipment included in the simulator control room:

Reactor Core Cooling panel	C03	
Cleanup and Cooling panel	C04	
Reactor Control panel	C05	
Feedwater and Condensate panel	C06	
Turbine and Generator Control panel	C07	
Auxiliary Electrical Control panel	C08	
Process/Area Radiation panel	C02	
Process Radiation panel	C10	Partial
Area Radiation panel	C11	
Leak Detection and Temp Monitoring panel	C21	
Single Rod Scram Test panel	C16	
Remote Shutdown panel	C292	
Offgas Control panel	C252	
Nitrogen Inerting panel	C26	
Combustible Gas Control panel	C291	
Standby Gas Treatment panel	C24	
Drywell Cooling panel	C25	
Startup Range Neutron Monitor panel	C36	Partial
Power Range Neutron Monitor panel	C37	Partial
Traversing Incore Probe panel	C13	Partial
HVAC and Feedwater heater Control panel	C20	
Generator Protection and Monitoring panel	C31	Partial
Wide Range Gas Monitor Channel A	C257	
Hydrogen/Oxygen Monitor Panel Channel A	C259	
Operators Desk	C01	

2. Partial simulations of control room back panels:

Process Radiation Monitor Panel	C10
Plenum Monitor Channel 1 & 2:	CH 1 is simulated.
Fuel Pool Monitor Channel A&B:	CH A is simulated.
Discharge Canal Monitor Channel A&B:	CH A is simulated.
Startup Range Neutron Monitor Panel	C36
Source Range Channel 21, 22, 23 & 24:	CH 21 is simulated.
Intermediate Range Channel 11 thru 18:	CH 11 is simulated.
Power Range Neutron Monitor Panel	C37
Average Power Channel 1,2,3,4,5 & 6:	CH 4 is simulated.
Local Power Group 1 & 2:	Group 1 is simulated.
Traversing Incore Probe Panel	C13
TIP Machine 1, 2 & 3:	One machine, used to simulate 1, 2, or 3 with remote function.
Generator Protection & Monitoring Panel	C31
Recorders and Relays:	Relays not physically simulated.

3. Equipment not incorporated in the Simulator:

Seismic Monitoring Cabinet	
Loose Parts Monitoring Cabinet	
Fire Detection Cabinet	C300
Wide Range Gas Monitor Channel B	C258
Hydrogen/Oxygen Monitor Channel B	C260
Reactor Protection Division 1 Relay panel	C15
Reactor Protection Division 2 Relay panel	C17
Vax Network Laser Printer LN03	CRMP
Emergency Filtration Training Control panels	C263
Talk-A-Phone intercom on operators desk	
Giatronics page below operators' desk	

4. Design assumptions used on the simulator:

The actual design assumptions are listed in the Final Design Specification for each of the systems. Listed below are some of the generalized assumptions used on all of the systems:

a. Containments, vessels, piping and other systems do not fail due to exceeding the design press or temperature.

b. Systems operate in a ideal manner. Valves do not leak, check valves do not allow any reverse flow, fuel is not damaged unless acted on by a malfunction.

5. Simulator Control Room Environment:

The simulator room environment is similar to the actual control room environment. The following features have been incorporated to make the environment similar to that of the actual control room:

a. The furniture is identical. Two sets from the same supplier with the same specifications were installed.

b. Annunciator sounds are identical.

c. The carpet and the colors are similar to those used in the control room.

d. Lighting levels have been adjusted to the same level as the control room.

e. Identical emergency lighting has been installed.

f. The same phones as the control room are used.

g. The sound levels in simulator are close to those in the plant control room.

Some differences that exist between the simulator and the plant are listed below:

a. The ceiling height in the simulator is 24 inches higher than the plant control room.

b. The Instructor Station in the simulator room, is located where the kitchen and rest room are in the plant.

c. The print racks used in the simulator are different and are stored in a different location than those in the actual Control Room.

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APPENDIX #3

INITIAL CONDITIONS

IC NO.	RX PWR %	CORE FLOW %	RX PRESS PSIG	XENON DK/K -%	REACT DK/K %	CORE LIFE	REMARKS
1	0.	0.0	0.15	-4.595E-11	-0.160	EOC	RX S/D-MOST SYSTEMS SECURED
2	0.	18.8	0.03	-7.526E-11	-0.146	MOC	RX S/D-READY FOR ROD WITHDRAWAL
3	0.	22.0	0.50	-4.729E-09	-0.149	EOC	RX S/D-READY FOR ROD WITHDRAWAL
4	0.	13.7	0.03	-4.809E-11	-0.090	BOC	RX S/U IN PROGRESS-NEAR CRITICAL
5	0.	14.3	0.35	-4.982E-09	-0.081	EOC	RX S/U IN PROGRESS-NEAR CRITICAL
6	1.	19.8	105.5	-2.604E-05	-0.081	BOC	PLANT HEATUP IN PROGRESS
7	2.	27.9	408.5	-6.690E-05	-0.075	BOC	PLANT HEATUP IN PROGRESS
8	4.	29.4	801.2	-1.977E-04	-0.077	BOC	PLANT HEATUP IN PROGRESS-MODE SW TO RUN
9	16.	38.8	924.4	-2.130E-04	-0.079	BOC	PLANT S/U-READY TO ROLL T/G
10	17.	39.0	927.6	-4.857E-04	-0.061	BOC	PLANT S/U-READY FOR GEN LOAD
11	56.	45.0	954.7	-1.497E-03	-0.021	BOC	PLANT S/U-100% ROD PATTERN
12	91.	85.7	990.1	-2.127E-02	0.0010	EOC	CLOSED CYCLE-SUMMER
13	99.	99.1	1010.7	-2.183E-02	0.0131	BOC	FULL POWER-FALL
14	99.	99.0	1005.9	-2.108E-02	0.0070	MOC	FULL POWER-WINTER
15	99.	99.5	1010.3	-2.107E-02	0.0083	EOC	FULL POWER-SPRING/FALL
17	51.	45.4	948.8	-2.216E-02	-0.026	MOC	PLANT S/D IN PROGRESS
18	9.	35.4	922.2	-2.790E-02	-0.082	EOC	PLANT S/D-T/G READY FOR S/D
19	2.	26.8	872.6	-2.987E-02	-0.129	EOC	HOT STBY-CONDENSER AVAILABLE
20	1.	24.2	556.5	-3.179E-02	-0.123	EOC	HOT STBY-CONDENSER NOT AVAILABLE
21	1.	20.8	36.8	-3.252E-02	-0.240	EOC	PLANT S/D-READY FOR S/D COOLING
23	0.	12.7	576.8	-3.169E-02	-0.131	EOC	RX S/D-PEAK Xe-HOT
24	0.	18.1	150.8	-3.058E-02	-0.098	MOC	RX S/D-PEAK Xe-COLD
25	93.	100.0	995.4	-2.545E-02	0.0082	BOC	POWER OPS-PEAK Xe
26	82.	100.8	984.3	-2.022E-02	0.0021	EOC	EOC COAST DOWN

MONTICELLO SIMULATOR CERTIFICATION REPORT
LIST OF CERTIFIED MALFUNCTIONS
APPENDIX #4

Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
AP01	SRV FAIL OPEN	12/10/88	X.1.d	S	MALF
AP02	SPURIOUS ADS ACTUATE	12/15/88	X.23	S	MALF
AP03	SRV LEAK	01/06/89	X.1.d	S	MALF
AP04	SRV FAIL IN SAFE MOD	01/07/89	X.23	S	MALF
AP05	SRV FAIL TO RESEAT	01/07/89	X.23	S	MALF
AP06	ADS AUTO INIT FAIL	01/17/89	X.23	S	MALF
CH01	CNTRL ROD DRIFTS OUT	01/20/89	X.12	S	MALF
CH02	CONTROL ROD STUCK	01/20/89	X.12,13	S	MALF
CH03	CNTRL ROD UNCOUPLED	01/20/89	X.12	S	MALF
CH04	CNTRL ROD ACCUM TRBL	01/20/89	X.12	S	MALF
CH05	CNTRL ROD SCRAM	01/20/89	X.12	S	MALF
CH06	CNTRL ROD OUT VLV LK	01/20/89	X.12	S	MALF
CH07	CRD CNTRL FLO VLV	01/20/89	X.12	S	MALF
CH08	CRD PMP,BKR TRIP	01/20/89	X.12	S	MALF
CH09	CNTRL ROD DR,SEALS	01/20/89	X.12	S	MALF
CH10	RPIS POWER FAIL	01/20/89	X.12,13	S	MALF
CH11	RMCS TIMER	03/31/90	X.12,13	S	MALF
CH12	CNTR RD FAIL DESELCT	03/31/90	X.12,13	S	MALF
CH13	FAIL RMC SYST	03/31/90	X.12,13	S	MALF
CH14	REED SW FAIL	03/31/90	X.12.13	S	MALF
CH15	RELIEF VLV FAIL OPEN	03/31/90	X.12,13	S	MALF
CH16	ROD FAIL TO INSERT	03/31/90	X.12,13	S	MALF
CH17	SDV ISO VLV FAIL	03/31/90	X.12,19	S	MALF
CH18	ATWS FAIL	03/31/90	X.17	S	MALF
CH19	MULT STUCK RODS	03/31/90	X.12	S	MALF
CH20	BLOWN SCRAM FUSE A	08/08/90	X.12	S	MALF
CH21	BLOWN SCRAM FUSE B	08/08/90	X.12	S	MALF
CS01	CS PMP #11 TRIP	04/17/90	X.23	S	MALF
CS02	CS OUTBRD VLV FAIL	04/17/90	X.7,23	S	MALF
CS03	CS PIP A BREAK	04/17/90	X.7,23	S	MALF
CW01	CIRC PMP #11 VIBRATE	04/18/90	X.5,6,8	S	MALF
CW02	CIRC PMP #11 TRIP	04/19/90	X.5,6,8	S	MALF
CW03	PMP #11 LO BASIN LVL	04/19/90	X.5,6,8	S	MALF
CW04	PMP #11 PIT FLOOD	04/19/90	X.5,6,8	S	MALF
CW05	COOL TWR PMP 11 VIBR	04/19/90	X.5,6	S	MALF
CW06	COOL TWR PMP 11 TRIP	04/23/90	X.5,6	S	MALF
CW07	COOL TWR FAN A TRIP	04/23/90	X.5,6	S	MALF
CW08	CONDENSER PIT FLOOD	04/23/90	X.5,6	S	MALF
DG01	DSL GEN #11 TRIP	04/23/90	X.3,23	S	MALF
DG02	DSL GEN 11 FAIL STAR	04/23/90	X.3,23	S	MALF
DG03	DSL GEN 11 AUTO STAR	04/23/90	X.3,23	S	MALF
DG04	#13 DSL GEN TRIP	05/15/90	X.3	S	MALF
DG05	FAIL #13 GEN TO LOAD	04/23/90	X.3	S	MALF
ED04A	LOSS GEN MAIN TRANS	04/24/90	X.3	S	MALF
ED04B	LOSS 1AR TRANS	04/24/90	X.3	S	MALF
ED04C	LOSS 1R TRANS	04/12/90	X.3	S	MALF

MONTICELLO SIMULATOR CERTIFICATION REPORT
LIST OF CERTIFIED MALFUNCTIONS
APPENDIX #4

Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
ED04D	LOSS 2R TRANS	04/24/90	X.3	S	MALF
ED04E	LOSS 2RS TRANS	04/24/90	X.3	S	MALF
ED04F	LOSS 1ARS TRANS	04/25/90	X.3	S	MALF
ED05A	BUS 11 LOCKOUT	04/25/90	X.3	S	MALF
ED05B	BUS 12 LOCKOUT	04/25/90	X.3	S	MALF
ED05C	BUS 13 LOCKOUT	04/25/90	X.3	S	MALF
ED05D	BUS 14 LOCKOUT	04/25/90	X.3	S	MALF
ED05E	BUS 15 LOCKOUT	04/25/90	X.3	S	MALF
ED05F	BUS 16 LOCKOUT	04/25/90	X.3	S	MALF
ED06A	LOSS LC 101	04/26/90	X.3	S	MALF
ED06B	LOSS LC 102	04/26/90	X.3	S	MALF
ED06C	LOSS LC 103	04/26/90	X.3	S	MALF
ED06D	LOSS LC 104	04/26/90	X.3	S	MALF
ED06E	LOSS LC 105	05/14/90	X.3	S	MALF
ED06F	LOSS LC 106	04/26/90	X.3	S	MALF
ED06G	LOSS LC 109	04/26/90	X.3	S	MALF
CD07	LOSS 250VDC DIV I	04/26/90	X.3	S	MALF
CD08	LOSS 125VDC BUS II	04/26/90	X.3	S	MALF
ED09	LOSS 24VDC BATTRY 15	04/26/90	X.3	S	MALF
ED10A	LOSS Y10	05/01/90	X.3	S	MALF
ED10B	LOSS Y30	05/14/90	X.3	S	MALF
ED10C	LOSS Y70	05/01/90	X.3	S	MALF
ED10D	LOSS Y80	05/02/90	X.3	S	MALF
ED11A	LOSS Y20	05/02/90	X.3	S	MALF
ED11B	LOSS Y25	05/02/90	X.3	S	MALF
ED11C	LOSS Y26	05/02/90	X.3	S	MALF
ED12	LOSS OFFSITE POWER	07/19/90	X.3	S	MALF
ED13	NETWORK LOAD DECREAS	05/01/90	X.3	S	MALF
ED14	NETWORK LOAD INCREAS	05/01/90	X.3	S	MALF
ED15	MN TRANSF FAN FAIL	05/01/90	X.3	S	MALF
ED16	2R COOL FAN FAIL	05/01/90	X.3	S	MALF
ED19	1R DEGRADED VOLTAGE	05/01/90	X.3	S	MALF
ED20	Y91 INVERTER FAIL	05/01/90	X.3	S	MALF
ED21	FAIL 17 BATTERY	05/01/90	X.3	S	MALF
EG01	LOSS STATOR COOLING	05/02/90	X.6	S	MALF
EG02	STATOR COOL PMP TRIP	05/16/90	X.6	S	MALF
EG03	GEN LOCKOUT	05/02/90	X.16	S	MALF
EG04	ISOPH BUS FAN TRP	05/02/90	X.16	S	MALF
EG05A	GEN VOLT REG LOW	05/02/90	X.16	S	MALF
EG05B	GEN VOLT REG HIGH	05/02/90	X.16	S	MALF
EG06	LOSS GEN FIELD	05/21/90	X.16	S	MALF
EG07	GEN MAX EXCITATION	05/02/90	X.16	S	MALF
EG08	GEN HYDRO LEAKAGE	05/02/90	X.16	S	MALF
FW03	CONDNSTE PMP 11 TRIP	10/15/90	X.9,10	S	MALF
FW04	CONDENSAT PMP HI VIB	05/04/90	X.9,10	S	MALF
FW06	CND REC VLV FAIL OPN	05/04/90	X.9,10	S	MALF

MONTICELLO SIMULATOR CERTIFICATION REPORT
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Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
FW07	COND DEM 11 RES DEPL	05/04/90	X.9,10	S	MALF
FW08	COND DEMN #11 HI D/P	05/07/90	X.9,10	S	MALF
FW09	DEMN MSTR FLOW FAILS	05/07/90	X.9,10	S	MALF
FW10	DEMN RES RETEN FAIL	05/07/90	X.9,10	S	MALF
FW11	EXH HOOD SPR VLV FAL	05/07/90	X.9,15	S	MALF
FW12	HTR DRN TNK HI LVL	05/07/90	X.9	S	MALF
FW14	LO PRS FW HTR TUB LK	05/07/90	X.9	S	MALF
FW15	FW PMP BEAR HI TEMP	05/07/90	X.9	S	MALF
FW16	REACT FDPMP #11 TRIP	05/07/90	X.9	S	MALF
FW17	FW RECIRC VLV FAILS	05/07/90	X.9	S	MALF
FW19	HI PRS FW HTR TUB LK	05/08/90	X.9	S	MALF
FW20	LOSS AIR FW REG VLV	05/08/90	X.9	S	MALF
FW21	FAIL REG VLV M/A CNT	05/08/90	X.9	S	MALF
FW23	FAIL SHFT 3-1 ELEMNT	05/08/90	X.9	S	MALF
FW24	FAIL FW FLO TRANSMIT	05/08/90	X.9	S	MALF
FW25	FW PIP BRK/PRIM CONT	10/30/90	X.9,20	S	MALF
CW26	FW LOOPBRK/PRIM CONT	10/30/90	X.9,20	S	MALF
CP01	HPCI AUTO INIT	05/09/90	X.10,23	S	MALF
HP02	HPCI AUTO-STRT FAIL	05/09/90	X.10,23	S	MALF
HP03	HPCI TURBINE TRIP	05/09/90	X.10,23	S	MALF
HP04	HPCI SPD CNT FAIL HI	05/09/90	X.10,23	S	MALF
HP05	HPCI AUTO-ISO	05/09/90	X.10,23	S	MALF
HP06	LOSS COOL-GALND SEAL	05/09/90	X.10,23	S	MALF
HP07	HPCI STEAM LINE LEAK	05/09/90	X.10,20,23	S	MALF
HP08	FAIL HPCI AUTO ISOL	08/01/90	X.23	S	MALF
IA01	SERV AIR COMPR TRIP	09/06/90	X.2	S	MALF
IA02	SERV AIR ISO	05/10/90	X.2	S	MALF
IA03	AIR COMP FAIL LOAD	05/10/90	X.2	S	MALF
IA04	IA HDR FAIL:RX BUILD	05/10/90	X.2	S	MALF
IA05	DW IA LINE RUPTURE	05/10/90	X.2	S	MALF
IA06	DECR SA LINE PRESS	05/10/90	X.2	S	MALF
MC01	LO PRS CNDS TUBE LEK	05/12/90	X.5	S	MALF
MC02	LO PRS CNDS TUBE RUP	05/12/90	X.5	S	MALF
MC03	CNDS AIR IN-LEAK	05/14/90	X.5	S	MALF
MC04	SJAE PRS CONT VLV FL	05/14/90	X.5	S	MALF
MC05	SJAE SUCT VLV AUTO	05/21/90	X.5	S	MALF
MS01	MSIV INBRD FAIL CLOS	05/15/90	X.17,23,25	S	MALF
MS02	MSIV OUTBRD FAL CLOS	05/15/90	X.17,23,25	S	MALF
MS03	MN STM LN B RUP TUNN	05/15/90	X.1.b,20	S	MALF
MS04A	MN STM LN RUP DW A	10/06/90	X.1.b,20	S	MALF
MS04B	MN STM LN RUP DW B	10/06/90	X.25	S	MALF
MS05	MSIV INBRD FAIL CLOS	05/15/90	X.25	S	MALF
OS06	MSIV OTBRD FAIL CLOS	05/15/90	X.25	S	MALF
ES07	MSIV DISC SEP FRM OP	05/15/90	X.25	S	MALF
MS08	TURB STM SEAL REG/HI	05/15/90	X.5	S	MALF
MS09	STM PKG EXH MTR TRIP	05/15/90	X.5	S	MALF

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Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
MS10	FAIL MN STM FLO TRNS	05/15/90	X.25	S	MALF
MS11	MAIN STM LINE RUPTUR	10/06/90	X.20	S	MALF
NI01	SRM CH FAIL DWNSCALE	05/16/90	X.21	S	MALF
NI02	SRM CH FAIL FULSCALE	05/16/90	X.21	S	MALF
NI03	SRM CH INOPERATIVE	05/16/90	X.21	S	MALF
NI04	SRM CH DTECT STUCK	05/16/90	X.21	S	MALF
NI05	IRM CH DWNSCALE	05/16/90	X.21	S	MALF
NI06	IRM CH FULLSCALE	05/16/90	X.21	S	MALF
NI07	IRM CH INOPERATIVE	05/16/90	X.21	S	MALF
NI08	IRM CH DETECT STUCK	05/16/90	X.21	S	MALF
NI09	IRM CH SPUR INDICT	05/16/90	X.21	S	MALF
NI10	LPRM FAIL DWNSCALE	05/20/90	X.21	S	MALF
NI11	LPRM FAIL FULLSCALE	10/30/90	X.21	S	MALF
NI12	APRM CH DOWNSCALE	05/22/90	X.21	S	MALF
NI13	APRM CH FAIL FULSCAL	05/22/90	X.21	S	MALF
NI14	APRM INOPERATIVE	05/22/90	X.21	S	MALF
NI15	RBM CH FAIL DWNSCALE	05/22/90	X.21	S	MALF
NI16	RBM CH FAIL UPSCALE	05/22/90	X.21	S	MALF
NI17	RBM CH INOPERATIVE	05/22/90	X.21	S	MALF
OG01	AIR EJECT DISCH BURN	05/12/90	X.22	S	MALF
OG02	OG EXPLOSION	05/12/90	X.22	S	MALF
OG03	OG RECOMB TEMP LOW	05/12/90	X.22	S	MALF
OG05	OG COMPRSS FAIL	05/12/90	X.22	S	MALF
OG06	OG TRN HI H2 OUT IND	05/12/90	X.22	S	MALF
OG07	RECOMB TRN LO STMFLO	05/12/90	X.22	S	MALF
PC01	SBGT EXH FAN TRIP	05/23/90	X.22,23	S	MALF
PC02	SPUR SECOND CONT ISO	05/23/90	X.22,23	S	MALF
PC03	DRWELL IA SYS FAIL	05/23/90	X.22,23	S	MALF
PC04	DRWELL COOL CIRC FAN	05/23/90	X.22,23	S	MALF
PC06	SBGT HIGH TEMP	05/23/90	X.22,23	S	MALF
PC07	FAIL DRWELL TO TORUS	05/23/90	X.22,23	S	MALF
PC09	SRV LINE BREAK	05/23/90	X.22,23	S	MALF
PP01	LOSS OF RPS-MG SET	07/08/90	X.11	S	MALF
PP03	RPS SUBCHNNL FAIL	07/19/90	X.11	S	MALF
PP04	AUTO SCRAM FAIL	07/19/90	X.11,24	S	MALF
PP05	SPUR GP 1 ISO TRIP	08/13/90	X.11,23	S	MALF
PP06	FAIL OF MODE SWITCH	08/09/90	X.11,23,24	S	MALF
RC01	RCIC AUTO-START FAIL	05/24/90	X.10,17,23	S	MALF
RC02	RCIC AUTO INITIATION	05/23/90	X.17,23	S	MALF
RC03	RCIC TURBINE TRIP	05/23/90	X.10,17,23	S	MALF
RC04	RCIC ISOLATION SIGN	05/24/90	X.10,17,23	S	MALF
RC05	RCIC SPEED CONT FAIL	05/23/90	X.10,17,23	S	MALF
RC06	RCIC LUBE OIL COOLER	05/23/90	X.10,17,23	S	MALF
RC07	RCIC STEAM BREAK	05/24/90	X.1.b,10,17	S	MALF
RC08	FAIL RCIC AUTO ISOL	08/13/90	X.23	S	MALF
RH01	RHR PUMP TRIP	05/24/90	X.7,17	S	MALF

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Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
RH02	RHR HEAT EX TUBE LK	05/24/90	X.7,17	S	MALF
RH04	RHR SHUT ISOL SIGNAL	05/24/90	X.7,17	S	MALF
RH05	RHR MIN FLOW VALVE	05/24/90	X.7,17	S	MALF
RH06	RHR CNTR VLV FAILS	05/24/90	X.7,17	S	MALF
RM02	PRM DOWNSCALE	01/11/91	X.22	S	MALF
RM03	ARM HIGH RAD	11/21/90	X.22	S	MALF
RM04	ARM DOWNSCALE	10/12/90	X.22	S	MALF
RR01	SMALL RECIRC BREAK	10/03/90	X.1.b	S	MALF
RR02	RR JET PUMP RISER BK	10/05/90	X.1.b,1.c	S	MALF
RR03	RR LOOP RUPTURE	10/05/90	X.1.b,1.c	S	MALF
RR04	INSTR LINE RUPTURE	10/03/90	X.1.b	S	MALF
RR05	RX RECIRC PUMP LOCK	05/29/90	X.4	S	MALF
RR06	RX RECIRC SEIZURE	05/30/90	X.4	S	MALF
RR07	RX PUMP TEMP HIGH	05/30/90	X.4	S	MALF
RR08	RX HIGH VIBRATION	08/08/90	X.4	S	MALF
RR09	RX PUMP RUN AWAY	05/30/90	X.4,17	S	MALF
RR10	RX MG BREAKER TRIP	05/30/90	X.4	S	MALF
RR11	RX INCOMP START	05/30/90	X.4,17	S	MALF
RR12	FAULTY TEMP SIGNAL	08/09/90	X.4	S	MALF
RR13	RECIRC SPEED FAILURE	05/30/90	X.4,17	S	MALF
RR14	RECIRC CONTROL FAILS	05/30/90	X.4,17	S	MALF
RR15	RX INSTR FAILURE	05/31/90	X.4	S	MALF
RR16	RECIRC SEAL FAILURE	05/31/90	X.4,1.b,1.c	S	MALF
RR17	RECIRC SEAL FAILURE	05/31/90	X.4,1.b,1.c	S	MALF
RR18	INSTR JET PUMP FAIL	09/29/90	X.22	S	MALF
RR19	NON INSTR PUMP FAIL	06/12/90	X.22	S	MALF
RR20	ATWS TRIP	07/10/90	X.17,23,24	S	MALF
RR21	RECIRC LINE BREAK	07/10/90	X.1.b,1.c	S	MALF
RR22	RECIRC OIL PUMP TRIP	07/10/90	X.4	S	MALF
RR23	ATWS FAILURE	08/13/90	X.24	S	MALF
RR24	FAIL WR TRANSMITTER	09/24/90	X.22,23	S	MALF
RR25	FAIL NR TRANSMITTER	09/24/90	X.22,23	S	MALF
RR27	RCP SPEED CONTR FAIL	06/12/90	X.4,17	S	MALF
RU01	RWCU TRIP	05/29/90	X.22,23	S	MALF
RU02	RWCU FILTER PRESSURE	05/25/90	X.22,23	S	MALF
RU03	NON HEAT EX TEMP	05/29/90	X.22,23	S	MALF
RU04	RWCU RESIN DEPLETION	05/29/90	X.22,23	S	MALF
RU05	RWCU VALVE STICKS	05/29/90	X.22,23	S	MALF
RU06	RWCU EXCESS VALVE	05/29/90	X.22,23	S	MALF
RU07	FAIL RWCU SUCTION	05/29/90	X.22,23	S	MALF
RU08	FAIL RWCU AUTO ISOL	08/09/90	X.22,23	S	MALF
RW01	RWM EQUP FAILURE	09/29/90	X.12,13,23	S	MALF
RW02	RWM ALARM FAILURE	09/29/90	X.12,13,23	S	MALF
RW03	RWM FAIL ROD BLOCKS	08/12/90	X.12,12,23	S	MALF
RX01	FUEL FAILURE	10/01/90	X.14	S	MALF
RX02	INCREASE CNTR ROD	10/05/90	X.12	S	MALF

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Malfunction Number	Title	Date Tested	ANS 3.5 Reference X=Section 3.1.2	Test Status Sat/Unsat	Test Type
SL01	SBLC PUMP TRIP	06/13/90	X.17	S	MALF
SL02	LOSS SQUIB CONT	06/13/90	X.17	S	MALF
SW01	RBCCW PUMP TRIP	06/13/90	X.6	S	MALF
SW02	RBCCW LEAK DRYWELL	06/13/90	X.6	S	MALF
SW03	SERV WATER PUMP TRIP	06/13/90	X.6	S	MALF
SW04	EMERG PUMP TRIP	06/13/90	X.6	S	MALF
SW05	RHR/SW PUMP TRIP	06/15/90	X.6	S	MALF
SW06	RBCCW HEAT EX LEAK	06/15/90	X.6	S	MALF
TC01	TURB CNTR UNIT FAILS	06/16/90	X.15,25	S	MALF
TC02	TURBINE MASTER TRIP	06/16/90	X.15,25	S	MALF
TC03	MECH PRESS REG FAIL	06/16/90	X.25	S	MALF
TC04	ELEC REG FAILS	06/16/90	X.25	S	MALF
TC05	MECH REG OSCILLATION	06/16/90	X.25	S	MALF
TC06	TURBINE VALVE STUCK	06/16/90	X.25	S	MALF
TC07	TURB VALVE FAILS	06/16/90	X.25	S	MALF
TC08	TURBINE VALVE FAILS	06/16/90	X.25	S	MALF
TC09	TURBINE STOP FAILS	08/30/90	X.25	S	MALF
TU01	EPR OIL PUMP TRIP	06/16/90	X.22,25	S	MALF
TU02A	TURB BEAR HIGH TURB	07/17/90	X.15,22	S	MALF
TU02B	TURB BEAR HIGH GEN	07/23/90	X.15,22	S	MALF
TU03	SHAFT BEAR HIGH VIB	07/17/90	X.15,22	S	MALF
TU04	TURBINE GEN TEMP HI	07/18/90	X.15,22	S	MALF
TU05	LOSS OIL PRESSURE	06/16/90	X.15,22	S	MALF
TU06	TURBINE OIL LOW PRES	06/16/90	X.15,22	S	MALF

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LIST OF CERTIFIED MALFUNCTIONS
APPENDIX #4

SYSTEM CODES

CODE	SYSTEM
AN	ANNUNCIATORS
AP	AUTO PRESSURE RELIEF (SRV'S)
CG	COMBUSTION GAS CONTROL
CH	CONTROL ROD DRIVE HYDRALICS
CS	CORE SPRAY
CW	CIRC WATER
DG	DIESEL GENERATOR
ED	ELECTRICAL DISTRIBUTION
EG	ELECTRICAL GENERATION
FP	FIRE PROTECTION
FW	FEED & CONDENSATE WATER
HP	HIGH PRESSURE INJECTION
HV	HEAT & VENTILATION
IA	INSTRUMENT AIR
LD	LEAK DETECTION
MC	MAIN CONDENSER
MS	MAIN STEAM
NI	NUCLEAR INSTRUMENTATION
OD	ON DEMAND PROGRAMS PO
OG	OFF-GAS
PC	PRIMARY CONTAINMENT
PO	PROCESS COMPUTER
PP	REACTOR PROTECTION
RC	RCIC
RH	RHR
RM	RADIATION MONITOR
RR	REACTOR RECIRC
RU	REACTOR WATER CLEANUP
RW	ROD WORTH MINIMIZER
RX	REACTOR
SL	STANDBY LIQUID CONTROL
SW	SERVICE WATER
TC	TURBINE CONTROL
TU	TURBINE

MONTICELLO SIMULATOR CERTIFICATION REPORT
REMOTE FUNCTION LIST
APPENDIX #5

Remote Function Number	Description	Range	Status/ Value
AP01	DIV II LO-LO SET BYPASS SWITCH		BYP/AUTO
CG01	CGCS DIV I INLET, MO-4043A		OP/OF/CL
CG02	CGCS DIV II INLET, MO-4043B		OP/OF/CL
CG03	CGCS DIV I RECIRC, MO-4044A	0-100%	
CG04	CGCS DIV II RECIRC, MO-4044B	0-100%	
CG05	CGCS DIV I CONTROL SWITCH		OF/OP
CG06	CGCS DIV II CONTROL SWITCH		OF/OP
CH01	XR-21, CRD MAN ISOL VALVE (N.C.)		CL/OP
CH02	FR-11, CRD SEAL FLOW REG - 11 RX	0-5GPM	
CH03	FR-12, CRD SEAL FLOW REG - 12 RX	0-5GPM	
CH04	CRD-1, CRD PUMP SUCT FRM CST N.O		CL/OP
CH05	CRD-68, PMP SUC SUPP FRM COND		CL/OP
CH06	CRD-24, BYPASS MO-3-20, DRIVE WT	T CL/OP	
CH07	CRD-27, BYPASS MO-3-22, COOL WTR	T CL/OP	
CH08	CRD-30, CRD STOP ISOL VLV-RWCU		CL/OP
CH09	CRD WTR FILT 3-17A/3-17B IN/OUT	A/B	IN/OUT
CH10	#12 CRD PUMP SUC STNDBY FILTER		OUT/IN
CH11	CRD PP SUC FIL A-IN,B-IN,C-OUT	A/B/C	IN/OUT
CH12	CRD-5-1, CRD PUMP #11, DISCH.VLV	T CL/OP	
CH13	CRD-5-2, CRP PUMP #12, DISCH.VLV	T CL/OP	
CH14	CRD-8 PMP TEST BYPASS	T CL/OP	
CH15	CR (XX-YY) ELEC DIRM (121)		DRD/ARM
CH16	A F.C. STA CRD-16-1/CRD-18-1		CL/OP
CH17	B F.C. STA CRD-16-2/CRD-18-2		CL/OP
CH18	TRIP PSHBTTN #11 CRD PMP BREAKER		NRML/TRI
CH19	CLOSE PSHBTTN #11 CRD PMP BREAK		NRML/CLO
CH20	TRIP PSHBTTN #12 CRD PMP BREAKER		NRML/TRI
CH21	CLOSE PSHBTTN #12 CRD PMP BREAK		NRML/CLO
CH22	CRD-14, ACC CHRG WTR	T CL/OP	NRML/CLO
CH23	CRD FLOW CNTRL CV3-19A LO MAN CN	1.4-100	
CH24	CRD FLOW CNTRL CV3-19B LO MAN CN	1.4-100	
CH25	CRD PMP 11 ECCS LD SD BY14A-K17A		OUT/IN
CH26	CRD PMP 12 ECCS LD SD BY14A-K17B		OUT/IN
CW01	#11 COOLING TWR FAN E		STP/STRT
CW02	#11 COOLING TWR FAN C		STP/STRT
CW03	#11 COOLING TWR FAN A		STP/STRT
CW04	#12 COOLING TWR FAN P		STP/STRT
CW05	#12 COOLING TWR FAN M		STP/STRT
CW06	#12 COOLING TWR FAN K		STP/STRT
CW07	#11 COOLING TWR FAN TRIP RESET		NRML/RES
CW08	#12 COOLING TWR FAN TRIP RESET		NRML/RES
CW09	#11 COOLING TWR PUMP		STP/STRT
CW10	#12 COOLING TWR PUMP		STP/STRT
CW11	CW-MO-1154 CW COND OTLT VLV	CLOSE	AUTO/OPN
CW12	CW-MO-1155 CW COND OTLT VLV	CLOSE	AUTO/OPN
CW13	CW-MO-1156 CW COND INLT VLV		CL/OP

MONTICELLO SIMULATOR CERTIFICATION REPORT
REMOTE FUNCTION LIST
APPENDIX #5

Remote Function Number	Description	Range	Status/ Value
CW14	CW-MO-1157 CW COND INLT VLV		CL/OP
CW15	#11 CLOSED CYCLE MAKEUP PUMP		STP/STRT
CW16	#12 CLOSED CYCLE MAKEUP PUMP		STP/STRT
CW17	INTAKE ISOLATION GATE MO-1976		CL/OP
CW18	INTAKE ISOLATION GATE MO-1977		CL/OP
CW19	INTAKE ISOLATION GATE MO-1978		CL/OP
CW20	INTAKE ISOLATION GATE MO-1979		CL/OP
CW21	#11 TOWER SLUICE GATE MO-1899	T CL/OP	
CW22	#12 TOWER SLUICE GATE MO-1900	T CL/OP	
CW23	#11 CT PMP SLUICE GATE MO-1873	T CL/OP	
CW24	#12 CT PMP SLUICE GATE MO-1874	T CL/OP	
CW25	WATERBOX SCAVENGING PUMP P-50A		STP/STRT
CW26	WATERBOX SCAVENGING PUMP P-50B		STP/STRT
CW27	CW-16, DE ICING VLV	T CL/OP	
CW28	AIR/WTR F A=0/37,B=40/60,C=90/8		A/B/C
CW29	C.W RDWST VLV CV-3374/3376/3377		CL/OP
CW30	CW INTAKE SYSTEM TROUBLE		NRML/ACK
CW31	#11 COOLING TOWER FAN G		STP/STRT
CW32	#11 COOLING TOWER FAN J		STP/STRT
CW33	#11 COOLING TOWER FAN B		STP/STRT
CW34	#11 COOLING TOWER FAN D		STP/STRT
CW35	#11 COOLING TOWER FAN F		STP/STRT
CW36	#11 COOLING TOWER FAN H		STP/STRT
CW37	#12 COOLING TOWER FAN R		STP/STRT
CW38	#12 COOLING TOWER FAN T		STP/STRT
CW39	#12 COOLING TOWER FAN L		STP/STRT
CW40	#12 COOLING TOWER FAN N		STP/STRT
CW41	#12 COOLING TOWER FAN Q		STP/STRT
CW42	#12 COOLING TOWER FAN S		STP/STRT
CW43	#11 CT RISER VALVES, CW-3-1/4-1		CL/OP
CW44	#12 CT RISER VALVES, CW-3-2/4-2		CL/OP
DG04	Y91 INVERTER TROUBLE ANN RESET		NRML/RES
DG05	Y93 MAINTENANCE BYPASS SWITCH		NRML/ALT
DG06	52-704 480V Y93 MBS SUP BKR		OP/CL
DG07	52-804 480V Y91 SUP BKR		OP/CL
DG08	52-710 480V #13 D OUTPUT BRK OP		NRML/OP
DG09	#13 DIESEL GENERATOR		STP/STRT
DG10	52-710 480V #13 D OUTPUT BKR CL		NRML/CL
ED01	345 KV BUS VOLTAGE	311-379	
ED02	345 KV/115 KV YARD TROUBLE ANNUN		NRML/ACK
ED03	345 KV BKR 8N11		CL/OP
ED04	345 KV DISC 8N10		CL/OP
ED05	2RS XFMR PRI DISC		CL/OP
ED06	2R XFMR PRI SUPPLY BKR 3N4		CL/OP
ED07	2R XFMR ANN PANEL ACKNOWLEGE		NRML/ACK
ED08	1AR XFMR PRI SUPPLY BKR 1N2		CL/OP

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Remote Function Number	Description	Range	Status/ Value
ED09	1AR XFMR PRI SUPPLY BKR 1N6		CL/OP
ED10	1ARS XFMR PRI DISC		CL/OP
ED11	1ARS XFMR PRI SUPPLY SOURCE		10/345KV
ED12	#8 XFMR PRI SUPPLY BKR 1N4		CL/OP
ED13	#7 XFMR PRI SUPPLY BKR 1N7		CL/OP
ED14	MAIN GENERATOR DISCONNECT		CL/OP
ED18	RACK OT BKRS 152-101,201,301,401		NRML/OUT
ED19	TRIP PUSHBUTTON-ACB 152-101		NRML/TRI
ED20	CLOSE PUSHBUTTON ACB 152-101		NRML/CL
ED21	TRIP PUSHBUTTON ACB 152-102		NRML/TRI
ED22	CLOSE PUSHBUTTON ACB 152-102		NRML/CLO
ED23	TRIP PUSHBUTTON ACB 152-201		NRML/TRI
ED24	CLOSE PUSHBUTTON ACB 152-201		NRML/CLO
ED25	TRIP PUSHBUTTON ACB 152-202		NRML/TRI
ED26	CLOSE PUSHBUTTON ACB 152-202		NRML/CLO
ED27	TRIP PUSHBUTTON ACB 152-301		NRML/TRI
ED28	CLOSE PUSHBUTTON ACB 152-301		NRML/CLO
ED29	TRIP PUSHBUTTON ACB 152-302		NRML/TRI
ED30	CLOSE PUSHBUTTON ACB 152-302		NRML/CLO
ED31	TRIP PUSHBUTTON ACB 152-401		NRML/TRI
ED32	CLOSE PUSHBUTTON ACB 152-401		NRML/CLO
ED33	TRIP PUSHBUTTON ACB 152-402		NRML/TRI
ED34	CLOSE PUSHBUTTON ACB 152-402		NRML/CLO
ED35	TRIP PUSHBUTTON - ACB 152-308	13-15	NRML/TRI
ED36	CLOSE PUSHBUTTON - ACB 152-308		NRML/CLO
ED37	TRIP PUSHBUTTON - ACB 152-408	14-16	NRML/TRI
ED38	CLOSE PUSHBUTTON - ACB 152-408		NRML/CLO
ED39	TRIP PUSHBUTTON - ACB 152-511	1AR-15	NRML/TRI
ED40	CLOSE PUSHBUTTON - ACB 152-511		NRML/CLO
ED41	TRIP PUSHBUTTON - ACB 152-610	1AR-16	NRML/TRI
ED42	CLOSE PUSHBUTTON - ACB 152-610		NRML/CLO
ED43	BUS 17/18 X-TIE - ACB 152-703		CL/OP
ED44	BUS 17 SUPPLY DISC X7B		CL/OP
ED45	BUS 18 SUPPLY DISC X8B		CL/OP
ED52	480 VAC LC 105 BKR 52-501		CL/OP
ED53	480 VAC LC 105 ALT BKR 52-502		CL/OP
ED54	480 VAC LC 106 PRI BKR 52-601		CL/OP
ED55	480 VAC LC 106 ALT BKR 52-602		CL/OP
ED56	480 VAC LC 107 PRI BKR 52-701 CL		NRML/CLO
ED57	480 VAC LC 107/108 BKR 52-711 X-		NRML/OP
ED58	480 VAC LC 108 PRI BKR 82-801 CL		NRML/CLO
ED59	480 VAC LC 107 PRI BKR 52-701 OP		NRML/OP
ED60	480 VAC LC 107/108 BKR 52-711		NRML/CLO
ED61	480 VAC LC 108 PRI BKR 52-801		NRML/OP
ED69	REST NON-ES MCC 131,132,141,142B		NRML/RES
ED70	480 VAC MCC 131 SUP BKR 52-302		OP/CL

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Remote Function Number	Description	Range	Status/ Value
ED71	480 VAC MCC 132 SUP BKR 52-303		OP/CL
ED72	480 VAC MCC 133A SUP BKR 52-304		OP/CL
ED73	480 VAC MCC 134 SUP BKR 52-308		OP/CL
ED74	480 VAC MCC 141 SUP BKR 52-402		OP/CL
ED75	480 VAC MCC 142A SUP BKR 52-403		OP/CL
ED76	480 VAC MCC 142B SUP BKR 52-4231		OP/CL
ED77	480 VAC MCC 143A SUP BKR 52-404		OP/CL
ED78	480 VAC MCC 144 SUP BKR 52-408		OP/CL
ED79	SWING BUS TRANSFER BKR 52-3300		NRML/CL
ED80	SWING BUS TRANSFER BKR 52-4300		NRML/CL
ED81	LPCI SWING BUS MANUAL RESET		NRML/RES
ED82	480 VAC MCC 133B SUP BKR 52-307		NRML/CL
ED83	480 VAC MCC 143B SUP BKR 52-407		NRML/CL
ED86	DIV I INVERT Y71 TRBLE ANN RESET		NRML/RES
ED87	DIV II INVERT Y81 TRBL ANN RESET		NRML/RES
ED88	INST AC BUS Y10 DISC SWITCH Y74		CL/OP
ED89	INST AC BUS Y20 AUTO XFER SWITCH		NRML/EME
ED90	INST AC BUS Y30 DISC SWITCH Y84		CL/OP
ED91	INST AC BUS Y70 DISC SWITCH Y75		CL/OP
ED92	INST AC BUS Y80 DISC SWITCH Y85		CL/OP
ED93	INST AC MANUAL BYPASS SWITCH Y73		NRML/ALT
ED94	INST AC MANUAL BYPASS SWITCH Y83		NRML/ALT
EG01	GENERATOR HYDROGEN PURITY	0-100	
EG02	GENERATOR COND MON RESET		NRML/RES
EG03	GENERATOR HYDROGEN PRESSURE	0-60	
EG04	Y-07, STATOR COOLING TEMP ADJUST	0-100	
EG05	#1 GEN H2 SYSTEM TROUBLE ALARM		NRML/ACK
EG06	REG V/HZ HIGH RELAY RESET	VHZ	NRML/TRI
EG07	REG LOW GEN VOLT RELAY RESET	62/VHZ	NRML/TRI
FP01	TRANSFORMER DELUGE RESET		NRML/RES
FP02	DIESEL FIRE PUMP HAND SWITCH	OFF	AUTO/MAN
FW01	FW-7-1 CON PMP DISCHARGE VALVE	T CL/OP	
FW02	FW-7-2 CON PMP DISCHARGE VALVE	T CL/OP	
FW03	FW-32 CON RECIR CV BYPASS (NC)	T CL/OP	
FW04	CONDENSATE DEMIN A		OUT/IN
FW05	CONDENSATE DEMIN B		OUT/IN
FW06	CONDENSATE DEMIN C		OUT/IN
FW07	CONDENSATE DEMIN D		OUT/IN
FW08	CONDENSATE DEMIN E		OUT/IN
FW09	CON F/D SYS HI DP/FLO BAL OVRD		NRML/RES
FW10	AO-1740,CON FILT DEMIN BYPS VLV	T CL/OP	
FW11	FW-39 REJECT CV BYPASS (NC)	T CL/OP	
FW12	FW-38 MAN BL VLV/RE CV-1093A/B	T CL/OP	
FW13	FW-44 MAKEUP CV BYPASS (NC)	T CL/OP	
FW14	FW-42 MAN BL VLV/RE CV1094A/B	T CL/OP	
FW15	FW-MO-1088 A BLK VLV LP HTR	T CL/OP	

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Remote Function Number	Description	Range	Status/ Value
FW16	FW-MO-1089 B BLK VLV LP HTR	T	CL/OP
FW17	FW-58-1 A BL V OTLT LP HTR	T	CL/OP
FW18	FW-58-2 B BL V OTLT LP HTR	T	CL/OP
FW19	FW-82-1 LOW FLO FW-CV DISCH VLV		CL/OP
FW20	FW-82-2 LOW FLO FW-CV DISCH VLV		CL/OP
FW21	FW-88-1 CLNUP RCRC CNDSR FR LOOP	T	CL/OP
FW22	FW-88-2 CLNUP RCRC CNDSR B LOOP	T	CL/OP
FW23	FW-88-3 CLNUP RCRC TO MAIN COND	T	CL/OP
FW24	FW-MO-1614 FW FR A HP HTRS BLK V	T	CL/OP
FW25	FW-MO-1615 FW FR B HP HTRS BLK V	T	CL/OP
FW26	FW-98-1 REACTOR INJECTION VALVE		UNL/LKOP
FW27	FW-98-2 REACTOR INJECTION VALVE		UNL/LKOP
FW28	COND STOR TNK CONDUCTIVITY CHNGE	0.1/10	
FW29	COND SERV WTR PMP #11		ST/START
FW30	COND SERV WTR PMP #12		ST/START
FW31	CST-89 SHTDWN COOL SUCT FIL LN V	T	CL/OP
FW32	CST-91 B LOOP LPCI RTN FIL LN V	T	CL/OP
FW33	CST-93 B LP CONT SPRAY FIL LN V	T	CL/OP
FW34	CST-95 A LP LPCI RTN FIL LN VLV	T	CL/OP
FW35	CST-83 PCV-2992 BYPASS VALVE		CL/OP
FW36	CST-101-1 PCV-2458 BYPASS VALVE		CL/OP
FW37	CST-101-2 PCV-2459 BYPASS VALVE		CL/OP
FW38	DEMIN WATER TRANSFER PUMP #11		ST/START
FW39	DEMIN WATER TRANSFER PUMP #12		ST/START
FW40	COND DEMIN SYS TROUBLE ACK		NRML/ACK
FW41	FILL CST FROM WASTE SAMPLE TANK		CL/OP
FW42	DFCS INITIALIZATION OR RESTART		NRML/INI
FW43	FW LOW FLOW CV6-13 LOCAL MAN CN	1-100/O	
FW44	FW REG VLV CV6-12A LOCAL MAN CN	1-100/O	
FW45	FW REG VLV CV6-12B LOCAL MAN CN	1-100/O	
HV01	V-EF-10 SMPLE HOOD EX FAN		OFF/ON
HV02	V-EF-24A/24B MAN TRANSFER SWITCH		24B/24A
HV03	V-EF-24A/24B RX BLDG EX FAN CN		OFF/ON
HV04	V-EF-28 REFUELING POOL EXHAUST		OFF/ON
HV05	V-AC-10A RX BLDG SUP FAN		OFF/ON
HV06	V-AC-10B RX BLDG SUP FAN		OFF/ON
HV07	V-AH-4A REFUEL FLR SUP FAN		OFF/ON
HV08	V-AH-4B REFUEL FLR SUP FAN		OFF/ON
HV09	V-EF-11 TURBINE BLDG EX FAN		OFF/ON
HV10	V-EF-26 TURBINE BLDG EX FAN		OFF/ON
HV11	V-MX-1 SWITCH GEAR AREA FAN		ST/START
HV13	V-MZ-5 COND AREA SUPPLY AIR		ST/START
HV14	V-MZ-6 TURB BLDG SUPPLY AIR		ST/START
HV15	V-EF-20 MAIN EXHAUST FAN	HAND	OFF/AUTO
HV16	V-EF-21 MAIN EXHAUST FAN	HAND	OFF/AUTO
HV17	V-EF-22 MAIN EXHAUST FAN	HAND	OFF/AUTO

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Remote Function Number	Description	Range	Status/ Value
HV18	V-EF-20OR 22 LEAD FAN HAND SWITC		20/22
HV19	C1004A/B RECOMB BLDG EXHAUST FAN	4A	OFF/4B
HV20	V-FU-3A FILTER UNIT FAN	HAND	OFF/AUTO
HV21	V-FU-3B FILTER UNIT FAN	HAND	OFF/AUTO
IA01	#11 AIR COM DUAL CNTRL SELECTOR	HAND	OFF/AUTO
IA02	#12 AIR COM DUAL CNTRL SELECTOR	HAND	OFF/AUTO
IA03	#11 COMPRESSOR MODE SWITCH	HAND	OFF/AUTO
IA04	#12 COMPRESSOR MODE SWITCH	HAND	OFF/AUTO
IA05	#13 COMPRESSOR MODE SWITCH	HAND	OFF/AUTO
IA06	CNTRL PNL SEQ SEL SWITCH 1/2/3	C-A-B	ACB/BCA
IA07	AI-38 INSTR AIR MAN ISOL VLV		CL/OP
IA08	AI-41 INSTR AIR MAN ISOL VLV		CL/OP
IA09	#11 SERVICE AIR COMPRESSOR		RE/LOCAL
IA10	#12 SERVICE AIR COMPRESSOR		RE/LOCAL
IA11	AIR NITROGEN SELECTOR FOR DW AIR		NTGN/AIR
IA12	#11COMP ECCS LD SHED BPS 14A/17A		OUT/IN
IA13	#12COMP ECCS LD SHED BPS 14A/17B		OUT/IN
IA14	#13COMP ECCS LD SHED BPS 14A/19B		OUT/IN
MC01	MS-24-1 #11 AIR EJ PCV BYP NC	0-100	
MC02	MS-24-2 #12 AIR EJ PCV BYP NC	0-100	
MC03	MS-22-1/MS-23-1 #11 SJAE PCV INL		CL/OP
MC04	MS-22-2/MS-23-2 #12 SJAE PCV INL		CL/OP
MC05	MAIN COND ROTARY VAC PMP P-3		ST/START
MC06	MEC VAC PM SUC V OG-22-1/OG-22-2	0-100	
MC07	#11 SJAE 1ST EL PRI/SEC GAS/STM		CL/OP
MC08	#11 SJAE 2ND EL PRI/SEC GAS/STM		CL/OP
MC09	#12 SJAE 1ST EL PRI/SEC GAS/STM		CL/OP
MC10	#12 SJAE 2ND EL PRI/SEC GAS/STM		CL/OP
MC11	OG-20/OG-21 LP SEAL DRAIN SJAE		CL/OP
MS01	TSS-1 PRI STM/STMSEAL SYS IS VLV		CL/OP
MS02	CV-3133 MOIS SEP #11 D TNK #11	-6.5/24	
MS03	CV-1002 MOIS SEP #12 D TNK #12	-6.5/24	
MS04	CV-1004 MOIS SEP #13 D TNK #13	-6.5/24	
MS05	CV-3134 MOIS SEP #14 D TNK #14	-6.5/24	
MS06	CV-3127 MOIS SEP #11 D TNK #11	-6.5/24	
MS07	CV-1001 MOIS SEP #12 D TNK #12	-6.5/24	
MS08	CV-1003 MOIS SEP #13 D TNK #13	-6.5/24	
MS09	CV-3132 MOIS SEP #14 D TNK #14	-6.5/24	
MS10	INBOARD DC BYPASS JUMPER 16A-K69		OUT/IN
MS11	INBOARD AC BYPASS JUMPER 16A-K70		OUT/IN
MS12	OUTBOARD DC BYPS JUMPER 16A-K67		OUT/IN
MS13	OUTBOARD AC BYPS JUMPER 16A-K68		
NI01	BYPASS LPRM A,B,C,D (XX-YY) (96)		BYP/OPRT
NI02	SRM CHAN #21 GAIN ADJUSTMENT	0.5/1.5	
NI04	SRM CHANNEL #23 GAIN ADJUSTMENT	0.5-1.5	
NI05	SRM CHANNEL #24 GAIN ADJUSTMENT	0.5-1.5	

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Remote Function Number	Description	Range	Status/ Value
NI06	IRM CHANNEL #11 GAIN ADJUSTMENT	0.5-1.5	
NI07	IRM CHANNEL #12 GAIN ADJUSTMENT	0.5-1.5	
NI08	IRM CHANNEL #13 GAIN ADJUSTMENT	0.5-1.5	
NI09	IRM CHANNEL #14 GAIN ADJUSTMENT	0.5-1.5	
NI10	IRM CHANNEL #15 GAIN ADJUSTMENT	0.5-1.5	
NI11	IRM CHANNEL #16 GAIN ADJUSTMENT	0.5-1.5	
NI12	IRM CHANNEL #17 GAIN ADJUSTMENT	0.5-1.5	
NI13	IRM CHANNEL #18 GAIN ADJUSTMENT	0.5-1.5	
NI14	APRM CHANNEL #1 GAIN ADJUSTMENT	0.5-1.5	
NI15	APRM CHANNEL #2 GAIN ADJUSTMENT	0.5-1.5	
NI16	APRM CHANNEL #3 GAIN ADJUSTMENT	0.5-1.5	
NI17	APRM CHANNEL #4 GAIN ADJUSTMENT	0.5-1.5	
NI18	APRM CHANNEL #5 GAIN ADJUSTMENT	0.5-1.5	
NI19	APRM CHANNEL #6 GAIN ADJUSTMENT	0.5-1.5	
NI20	TIP MACHINE SELECT	11	12/13
OG01	PCV-7496A BYP LN OV PRESS C VLV	0-30	
OG02	PCV-7496B BYP LN OV PRESS C VLV	.5-30.5	
OG03	OG-52-1 EDUCTOR PRESS RELIEF IS	T CL/OP	
OG04	OG-52-2 EDUCTOR PRESS RELIEF IS	T CL/OP	
OG05	OG-50-1 RECOMB GAS INLT ISOL VLV	T CL/OP	
OG06	OG-50-2 RECOMB GAS INLT ISOL VLV	T CL/OP	
OG07	OG-55-1 RECOMB COND GAS OTLT VLV	T CL/OP	
OG08	OG-55-2 RECOMB COND GAS OTLT VLV	T CL/OP	
OG09	AT-7731A H2 ANALYZER		OFF/ON
OG10	AT-7731B H2 ANALYZER		OFF/ON
OG11	AT-7553A H2 ANALYZER		OFF/ON
OG12	AT7553B H2 ANALYZER		OFF/ON
OG13	AT-7552A H2 ANALYZER		OFF/ON
OG14	AT-7552B H2 ANALYZER		OFF/ON
OG15	F-2801A GAS COMPR SUCT FILTER		OUT/IN
OG16	F-2801B GAS COMPR SUCT FILTER		OUT/IN
OG17	OG-124-1 GAS COMPR INLT ISOL		CL/OP
OG18	OG-124-2 GAS COMPR INLT ISOL		CL/OP
OG19	OG-74-1 GAS COMPR OTLT ISOL		CL/OP
OG20	OG-74-2 GAS COMPR OTLT ISOL		CL/OP
OG21	C-1002A COMPR COOL WTR CHILLER		ST/START
OG22	C-1002B COMPR COOL WTR CHILLER		ST/START
OG23	OG-90 FCV-7676 BYPASS VLV	T CL/OP	
OG24	OG-88 FCV-7676 ISOL VLV		CL/OP
OG27	PC-7497A SETPOINT ADJUST	0-350	
OG28	PC-7497B SETPOINT ADJUST	0-350	
OG29	MS-51-1 MAN STM ISOL TO RECOMB	T CL/OP	
OG30	MS-51-2 MAN STM ISOL TO RECOMB	T CL/OP	
OG31	MS-53-1 STM TO RECOMB PREHEATER	T CL/OP	
OG32	MS-53-2 STM TO RECOMB PREHEATER	T CL/OP	
OG33	AO-2562A COND DRIP TANK VLV		CL/OP

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Remote Function Number	Description	Range	Status/ Value
OG34	AO-2562B COND DRIP TANK VLV		CL/OP
OG35	RADWASTE ALARM		NRML/ACK
PC01	DWV-13 N2 GAS SUPPLY VALVE	T	CL/OP
PC02	ROOTS BLOWER #1		ST/START
PC03	ROOTS BLOWER #2		ST/START
PC04	O2 ANALYZER SYSTEM		OUT/IN
PC05	N2-1 ROOTS BLWR MAN IS VLV-DRYWL		CL/OP
PC06	DWV-14 N2 VPRZR GAS DISCH VLV		CL/OP
PC07	DWV-29 N2 VPRZR LIQ INLT VLV	T	CL/OP
PC08	PRIM CONT OXYGEN SAMPLING		DRY/TOR
PC09	VENT ISOL SIG BYPASS INLOCK-JUMP		REM/INST
PC10	DRYWELL CAM TROUBLE ANNUNCIATOR		NRML/ACK
PC11	SGTS TRAIN A AUTO INIT BYPSS R1A		REM/INST
PC12	SGTS TRAIN B AUTO INIT BYPSS R1B		REM/INST
PC13	GROUP II ISOLATION BYPASS		REM/INST
PC14	MISV CLOSURE/COND VAC SCRAM BYPS		REM/INST
PC15	GROUP II ISOLATION BYPS TORUS DR		REM/INST
PP01	SET A BKR CN1A-CL/2A,1A-OP/2A-CL		NRML/ALT
PP02	SET B BKR C1B-CL/2B,1B-OP/2B-CL		NRML/ALT
PP03	RX LO-LO WTR LVL ISOL RLY JUMPER		REM/INST
PP04	RPS MG SET A LOCAT RESET		NRML/TRI
PP05	RPS MG SET B LOCAL RESET		NRML/TRI
RC01	RCIC MECH OVERSPEED TRIP RELAY R		NRML/RES
RC02	RCIC-10 RCIC ST/CHCK VLV POS ADJ	0-100	
RC03	RCIC-32 RCIC PMP SUCTION VALVE		CL/OP
RC04	RCIC MO-2075,2076,2078 AUTO/OP B		REM/INST
RH01	S/D CL SUP INBD ISOL V MO-2029BR		CL/OP
RH02	S/D CL SUP INBD ISOL V MO-2029IN		OUT/IN
RH03	S/D CL SUP INBD ISOL V MO-2030IN		OUT/IN
RH04	COND SUP-RHR IS VLV RH-18-1 LC		ULK/LKCL
RH05	COND SUP-RHR IS VLV RH-18-2 LC		ULK/LKCL
RH06	RHR SW-RHR LPCI S V RHR-SW-12/14		CL/OP
RH07	#11 RHR HX IN/OT I V RHR-4-1/5-1		CL/OP
RH08	#12 RHR HX IN/OT I V RHR-4-2/5-2		CL/OP
RH09	#11 RHR HX CORROSION	0-15	
RH10	#12 RHR HX CORROSION	0-15	
RH11	RHR-WST-23 IS V MO-2032 BRK 4211		OP/CL
RM01	SJAE SAMPLING SYSTEM A		OUT/IN
RM02	SJAE SAMPLING SYSTEM B		OUT/IN
RR01	RX RECIRC DC OIL PUMP #11	STOP	NRML/STA
RR02	RX RECIRC DC OIL PUMP #12	STOP	NRML/STA
RR03	#11 RX RECIRC GEN CK RELAY RESET		NRML/TRI
RR04	#12 RX RECIRC GEN LK RELAY RESET		NRML/TRI
RR05	#11 RX RECIRC AUX LK RELAY RESET		NRML/TRI
RR06	#12 RX RECIRC GEN AUX LK RLY RES		NRML/TRI
RR07	#11 RX RECIRC LP DIS TEMP	125-540	

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Remote Function Number	Description	Range	Status/ Value
RR08	#12 RX RECIRC LP DIS TEMP	125-540	
RR09	#11 RX RECIRC SC TUBE PWR SWITCH		OFF/ON
RR10	#12 RX RECIRC SC TUBE PWR SWITCH		OFF/ON
RR11	SLC BORON MIX CONCENTRATION	0-100	
RR12	#11 SCOOP TUBE MAN ADJUSTMENT	0-100	
RR13	#12 SCOOP TUBE MAN ADJUSTMENT	0-100	
RR14	TRIP PSHBTTN #11 REC DR MTR BRKR		NRML/TRI
RR15	CLOSE PSHBTTN #11 RE DR MTR BRKR		NRML/CL
RR16	TRIP PSHBTTN #12 RE DR MTR BRKR		NRML/TRI
RR17	CLOSE PSHBTTN #12 RE DR MTR BRKR		NRML/CLO
RU01	#11 RWCU FIL DEMIN FLOW CONTROL	0-100	
RU02	#12 RWCU FIL DEMIN FLOW CONTROL	0-100	
RU03	#11 RWCU FILTER DEMIN		OUT/IN
RU04	#12 RWCU FILTER DEMIN		OUT/IN
RU05	CLEANUP FILTER DEMIN ALARM		NRML/ACK
RU06	RC-103 RWCU HX BYPASS VALVE	T CL/OP	
RU07	RC-102 RWCU REGEN HX BYPASS VLV	T CL/OP	
RU08	RC-101 RWCU REGEN HX OUTLET VLV	T CL/OP	
RU09	BREAKER 3201 FOR MO-2401		OP/CL
RW01	ROD WORTH MIN CNTL ROD SEQ A/B		SEA/SEB
RW02	RW MINIMIZER INITIALIZED		NO/YES
RW03	RWM SYSTEM DIAGNOSTIC PUSHBUTTON		OFF/ON
SL01	SBLC LEVEL CALIBRATION	0.5-1.5	
SL02	A=XP-1OP,DM56CLS/XP-1CLS,DM56OPB		A/B
SW01	SW46-2 TURB L OIL CLR MAN IS VLV	0-100	POS
SW02	SW145/147 EM WTR-COND A HTWL MAN		CL/OP
SW03	DM-111 DEMIN MKP-RBCCW SURGE TNK		CL/OP
SW04	SW125-1 OTLT FROM 11 MGST OIL CO	0-100	POS
SW05	SW125-2 OTLT FROM 12 MGST OIL CO	0-100	POS
SW06	RBCC-26 RBCCW SRG TNK DRAIN VLV		CL/OP
SW07	RHR-SW PMP11 ECCS LD SD BYPS14A		OUT/IN
SW08	RHR-SW PMP12 ECCS LD SD BYPS14A		OUT/IN
SW09	RHR-SW PMP13 ECCS LD SD BYPS14A		OUT/IN
SW10	RHR-SW PMP14 ECCS LD SD BYPS14A		OUT/IN
SW11	SW PUMP #11 ECCS LD SD BYPS14A		OUT/IN
SW12	SW PUMP #12 ECCS LD SD BYPS14A		OUT/IN
SW13	RBCCW PMP11 ECCS LD SD BYPS14A		OUT/IN
SW14	RBCCW PMP12 ECCS LD SD BYPS14A		OUT/IN
TU01	#11 EPR OIL PUMP		STOP/RUN
TU02	#12 EPR OIL PUMP		STP/AUTO
TU03	MAIN TUR LUB OIL RES LEVEL ADJ	1-10000	
TU04	SET TURB METAL TEMP TO OP IN VLV	80-600	
TU05	MAIN TURB AUX OIL PUMP LOCKOUT		NRML/RES

MONTICELLO SIMULATOR CERTIFICATION REPORT
REMOTE FUNCTION LIST
APPENDIX #5

SYSTEM CODES

CODE	SYSTEM
AN	ANNUNCIATORS
AP	AUTO PRESSURE RELIEF (SRV'S)
CG	COMBUSTION GAS CONTROL
CH	CONTROL ROD DRIVE HYDRALICS
CS	CORE SPRAY
CW	CIRC WATER
DG	DIESEL GENERATOR
ED	ELECTRICAL DISTRIBUTION
EG	ELECTRICAL GENERATION
FP	FIRE PROTECTION
FW	FEED & CONDENSATE WATER
HP	HIGH PRESSURE INJECTION
HV	HEAT & VENTILATION
IA	INSTRUMENT AIR
LD	LEAK DETECTION
MC	MAIN CONDENSER
MS	MAIN STEAM
NI	NUCLEAR INSTRUMENTATION
OD	ON DEMAND PROGRAMS PO
OG	OFF-GAS
PC	PRIMARY CONTAINMENT
PO	PROCESS COMPUTER
PP	REACTOR PROTECTION
RC	RCIC
RH	RHR
RM	RADIATION MONITOR
RR	REACTOR RECIRC
RU	REACTOR WATER CLEANUP
RW	ROD WORTH MINIMIZER
RX	REACTOR
SL	STANDBY LIQUID CONTROL
SW	SERVICE WATER
TC	TURBINE CONTROL
TU	TURBINE

Special Instructor/Training Features

"SWITCH CHECK" feature provides the instructor with a visual indication of those consoles and/or back panels which have controls improperly selected for a given IC.

"SWITCH CHECK OVERRIDE" features enables the instructor to override the Switch Check feature and start the IC without all switches in the proper positions.

"BACKTRACK" feature enables the instructor to backtrack to a previous stored plant condition in either one (1) or ten (10) minute intervals for a total of sixty (60) data sets.

"REVERSE" allows the instructor to step through Backtrack file in reverse time.

"FORWARD" allows the instructor to step through Backtrack files in a forward time direction.

"FAST TIME" feature enables the instructor to control certain process 3, 6 or 10 times their normal speed. (E.G. xenon concentrations, turbine warmup/cooldown, plant cooldown-RHR only, hydrogen recombiner temperatures, and hydrogen concentration during post LOCA conditions).

"SLOW TIME" capability allows the instructor to freeze, backtrack, replay or run the scenario at a speed of 1/2, 1/4, or 1/10 real time.

"SNAPSHOT" feature allows the instructor to record the simulator status into the computer memory at any time. This capability permits the creation of a new initial condition at any time by the instructor.

"I/O OVERRIDE" feature provides the capability of failing meters and recorders in an as-is condition deflection. Controller inputs may be failed as-is or at a given percentage of full scale. The lights and displays may be failed as-is or on/off, as with switches.

"CRY WOLF" alarms will be spurious annunciator indications without the actual occurrence of the alarm triggering condition.

"REPLAY" will have the following capabilities:

If there is a change in state, all digital inputs and annunciator outputs will be recorded on tape once every quarter of a second.

If there is a 1% change in the value of any analog output or input or a change in the state of a digital output, all I/O's will be recorded once every second.

The replay system will be able to record two hours of simulator operations.

"EVENT TRIGGER" will allow for actuating each malfunction or I/O override based upon any data pool variable meeting a logical expression.

"INSTRUMENT NOISE" (Activate/Deactivate)

"TRAINEE PROFICIENCY REVIEW (TPR)"

The TPR allows the instructor to monitor up to twelve (12) parameters for the purpose of evaluating students.

"ANNUNCIATOR SOUND SILENCE" will silence the simulator annunciators.

"ANNUNCIATOR LAMP ACKNOWLEDGE" will acknowledge all of the simulator flashing annunciators.

"ANNUNCIATOR TEST" will test all simulator annunciators.

"RECORDER POWER OFF" will de-energize all of the simulator recorders.

"PARAMETER MONITORING"

One hundred (100) pre-selected parameters may be displayed and monitored in real time. Either the trending or bar graph displays may be used to display the selected parameters.

"TRENDING"

Shows percentage (0-100%) of range of selected parameter, sampled at a one sample/sec rate, displaying the previous sixty (60) seconds. Up to four (4) parameters may be displayed at a time with eight (8) colors to choose from.

"BAR CHARTS"

Same as above, except 4 parameters can be monitored at one time/per screen with 4 screens available.

"DAILY OPERATIONAL READINESS TEST (DORT)"

Allows the instructor the ability to test all analog (recorders and indicators) and digital (lamps) outputs for their proper response.

"LINE PRINTER"

Located in the Computer Room, this printer is an output device used primarily by maintenance personnel. Used by the instructor for hardcopy TPR reports.

APPENDIX #7

LIST OF MONTICELLO SIMULATOR MANUALS, PROCEDURES AND LOGS

Manuals and documents required for training Control Room Operators, located in the simulator control room are controlled in accordance with Monticello Nuclear Generating Plant Quality Assurance programs. The Training Center administrative staff personnel are responsible for updating and maintaining all "Controlled Documents" located in the simulator control room. The following are examples of manuals that are maintained in the simulator:

Technical Specifications and Interpretations
Administrative Controls Manual 4ACD and 4AWI (1.1 - 16.08.01)
Emergency Plan - MNGP (with Implementing Procedures)
Operations Manuals Volumes A through D
Alarm Response Procedures
EOP Flowcharts
Operations Memos
Volume C.4 Procedures
Volume F Memos
Operating One-line Diagrams
P & ID's (Drawings)
Control Room Drawing File (Stick File)
Operations Manual Pre-Fire Strategies
Process Computer Summaries
Process Computer System User's Manual (5 Volumes)
SPDS Manual
Surveillance Procedures (Appropriate to the Control Room)

Uncontrolled Procedures and documents which are provided for training use only are:

Posted Operator Aids (Curves and tables):
NSP - Power Production Policies and Procedures
Jumper, Bypass Log
Key Checkout Log
Monticello Hold and Secure Card Record
Shift Supervisors Shift Turnover Checklist

MONTICELLO SIMULATOR CERTIFICATION REPORT
Appendix #8

CERTIFICATION TEST ABSTRACT

TEST TITLE: Computer Real Time Measurement, Test XX01 **Rev.** 0

DESCRIPTION: Test simulator computers ability to run simulation in real time.

TEST DATE: November 4, 1990

REFERENCE: ANSI 3.5 Section 3.1.1 and Appendix A3.(1)

INITIAL CONDITIONS: 100% power, IC 15
Using Multiple timing tests

DATA COLLECTION METHOD(S): Timing Report and Timing Report Summary.

TEST PROCEDURE: Run time report program on Master and Slave Cpu's and IPU's

FINAL CONDITIONS/DURATION OF TEST:

Spare time should be at least 30%. No frame should exceed 100 milliseconds.

BASELINE REFERENCE DATA: None

TEST DEFICIENCIES/CORRECTIVE ACTIONS: Test Results were acceptable.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simulator Room Lighting Test, Test XX03 Rev. 0

DESCRIPTION: Comparison of plant control room lighting levels to simulator control room lighting levels.

TEST DATE: June 1990

REFERENCE: ANSI/ANS 3.5 Section 3.2.3 Simulator Environment

INITIAL CONDITIONS: N/A

DATA COLLECTION METHOD(S): Calibrated light meter, values recorded manually.

TEST PROCEDURE:

Light readings were taken at 43 locations in the plant Control Room using a calibrated light meter. Light readings were then taken in the simulator at the same 43 locations, and compared with the plant readings. The light switches and dimmer switches in the simulator were then adjusted to closely match the lighting level recorded in the plant. The switches and dimmers for the simulator were then marked to indicate the correct position to correctly simulate actual Control Room lighting.

FINAL CONDITIONS/DURATION OF TEST: N/A

8ASELINE REFERENCE DATA: Plant lighting levels

TEST DEFICIENCIES/CORRECTIVE ACTIONS: None

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simulator Sound Level Test, Test XX04 **Rev.** 0

DESCRIPTION: Comparison of plant control room sound levels to simulator control room sound levels.

TEST DATE: June 1, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.2.3 Simulator Environment

INITIAL CONDITIONS: N/A

DATA COLLECTION METHOD(S): Calibrated sound meter, values recorded manually.

TEST PROCEDURE:

Sound level readings were taken at 15 locations in the plant Control Room using a calibrated sound level meter. Sound level readings were then taken at the same 15 locations in the simulator and compared with the plant readings. The differences were slight; the sound levels did not adversely affect training.

FINAL CONDITIONS/DURATION OF TEST: N/A

BASELINE REFERENCE DATA: Plant sound levels

TEST DEFICIENCIES/CORRECTIVE ACTIONS: None

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simulator I/O Override Test, Test XX02 Rev. 0

DESCRIPTION: Test the functionality of randomly selected simulator I/O overrides.

TEST DATE: November 6, 1990 to December 12, 1990

REFERENCE: ANSI/ANS Section 3.4

INITIAL CONDITIONS: N/A

DATA COLLECTION METHOD(S): Manually record sort/unset for overrides.

TEST PROCEDURE:

Using the simulator I/O override listing, and the panel drawings; a list of devices to be tested was made up by randomly selecting 12 lamps, 6 switches, 3 meter each of the lights, the ability to override it to the off and on condition was verified, if the lamp was an annunciator the cry wolf feature was also tested. The ability to override each of the selected switches to all of the possible positions, and fail as this was verified. All of the selected meter/recorders were tested for the ability to override to zero, mid scale, and full scale. The selected potentiometers were overridden to zero, mid scale, and full scale with the effects verified to be correct.

FINAL CONDITIONS/DURATION OF TEST: N/A

BASELINE REFERENCE DATA: N/A

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

Some panels had a large number of failures. In those cases, the entire panel was checked. Discrepancy reports were written on all of the I/O overrides which failed to perform properly. All have been corrected and retested with satisfactory results.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: MTC Simulator Physical Fidelity Test, Test XX05 Rev. 0

DESCRIPTION: This test verifies the simulator control panels are correctly simulated to match the MNGP control panels.

TEST DATE: November 1989 to June 1990

REFERENCE: ANSI/ANS 3.5-1985 Section 3.2.1 and 3.2.2

INITIAL CONDITIONS: N/A

DATA COLLECTION METHOD(S):

Photographs were taken of the Monticello Nuclear Generating Plant Control Room panels in May and June of 1990. These photographs were used as a reference for verifying the control panels at the Monticello Training Center Simulator.

TEST PROCEDURE:

The process of verifying the simulator panels consisted of dating and sequentially numbering each of the reference plants panel's photographs. Documentation of the verification process was on the attached form, "MTC Simulator Photo Record".

The MTC Simulator Photo Record contains information such as:

1. Panel number, section of panel (upper/lower)
2. Number of photo, date of reference photo.
3. Date of simulator verification, individual verifying.
4. Discrepancies noted.
5. Discrepancies corrected.
6. Discrepancy Report written (yes/no).
7. DR number and date issued.
8. Date the DR is completed and the individual correcting the discrepancy.
9. Reason for not correcting discrepancy.
10. Number and date of photo superseding.

See attached copy of the MTC Simulator Photo Record form.
The test procedure for verification consisted of verifying each panel for labeling, recorders, indicators, lights, switches and mimic/demarkation lines.

FINAL CONDITIONS/DURATION OF TEST: N/A

BASELINE REFERENCE DATA: MNGP Control Room panel photographs.

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

The following Discrepancy Reports were written as a result of this test:
DR #'s 90-098 through 102 and 90-111 through 161.
10 DR's are still in the process of being corrected and will be completed by June 1, 1991. These DR's do not adversely effect training.

EPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

NORTHERN STATES POWER COMPANY
MONTICELLO TRAINING CENTER
SIMULATOR
PHOTO RECORD

PANEL: _____ SECTION: _____

PHOTO #: _____ PHOTO DATE: _____

DATE OF SIMULATOR VERIFICATION: _____ BY: _____

DISCREPANCIES NOTED: _____

_____

_____

_____

_____

DISCREPANCIES CORRECTED: _____

_____

_____

_____

_____

DR WRITTEN (Y/N)

DR NUMBER: _____ DATE ISSUED: _____

DATE CORRECTED: _____ BY: _____

REASON FOR NOT CORRECTING DISCREPANCIES: _____

_____

_____

_____

_____

PHOTO SUPERSEDED BY PHOTO #: _____ DATE: _____

CERTIFICATION TEST ABSTRACT

TEST TITLE: Manual Scram, Test TZ01 Rev. 0

DESCRIPTION:

A manual scram was actuated with all immediate operator scram actions performed. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE: November 15 and 20, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA)
c. Simulator Recorder data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Actuate a manual reactor scram.
3. Perform all immediate scram actions per C.4-A Reactor Scram.
4. Verify no unexpected transients or alarms occur during test.
5. Collect the required data as delineated on the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor in the hot shutdown condition, all rods inserted.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (Dynode-B)
b. Actual plant scram data (TRA Graphs).
c. Table Top Discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

Discrepancy Reports written, which will be corrected by March 1, 1991 are:

90-255 - Excessive Rx Press. Decrease
90-268 - RWCU Outlet Temp Decrease

NOTE: These discrepancies did not constitute a failure of the test because the severity was not great enough and do not adversely effect training.

EPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simultaneous trip of all Feedwater pumps, Test TZ02 Rev. 0

DESCRIPTION:

A dual feedwater pump trip was actuated from 100% power with no operator action performed. All automatic plant actions and interlocks were verified to occur as designed.

TEST DATE: November 13, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Simultaneously trip both reactor feedpumps.
3. Verify all automatic plant actions occur; take no operator action.
4. Collect the required data as delineated on the test procedure.
5. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor in the hot shutdown condition, all rods inserted. Reactor level restored utilizing HPCI and RCIC.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (Dynode-B)
b. Table top discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

No discrepancies directly related to the RFP trips.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simultaneous closure of all MSIVs, Test TZ03 Rev. 0

DESCRIPTION:

All MSIVs were simultaneously closed resulting in a reactor scram and subsequent plant transient. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE: November 14, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator recorder data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Actuate Malfunctions PP05A and PP05C simultaneously.
3. Verify all MSIVs have fully closed.
4. Verify all automatic plant actions occur; take no operator action.
5. Verify no transients or alarms occur that are incorrect or unexpected.
6. Collect the required data as delineated on the test procedure.
7. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor shutdown and isolated in the hot shutdown condition, all rods inserted.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (Dynode-B)
b. Table top discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Single Reactor Recirculation Pump trip, Test TZ04 Rev. 0

DESCRIPTION:

A single recirculation pump was tripped from 100% power operation resulting in the plant operating in a single loop configuration. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE: November 1 and 21, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder Data.

ST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Trip one operating Reactor Recirculation pump by manually opening the drive motor breaker.
3. Verify the pump trips and all parameters respond as expected: Take no immediate operator actions other than to monitor plant parameters.
4. Verify no unexpected transients or alarms occur during the test.
5. Collect the required data as delineated on the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

The reactor will be operating in a single loop configuration in accordance with approved plant operating procedures.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (Dynode-B).
b. Table top discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

CEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

TEST TITLE: Simultaneous trip of both Recirculation Pumps, Test TZ05 **Rev.** 0

DESCRIPTION:

A dual Reactor Recirculation Pump trip was effected from 100% power resulting in the reactor operating in the natural circulation mode. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE: November 14, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder Data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Simultaneously trip both Reactor Recirculation pumps by manually opening the drive motor breakers.
3. Verify both pumps trips and all parameters respond as expected. Take no immediate operator actions other than to monitor plant parameters.
4. Verify no unexpected transients or alarms occur during the test.
5. Collect the required data as delineated by the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

The reactor will be operating in the natural circulation mode in accordance with approved plant operating procedures.

BASELINE REFERENCE DATA:

a. Actual Plant Data (TRA graphs).
b. Table top discussion data.
c. NSP Nuclear Analysis Department "Best Estimate Computer Data (Dynode-B).

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Main Turbine Trip (Max. power with no scram), Test TZ06 Rev. 0

DESCRIPTION:

A Main Turbine trip was manually initiated with reactor power at the maximum point at which the trip did not directly cause a reactor scram. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE: N/A

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS:

Reactor power approximately 30% with annunciator 5-B-37 "TURBINE PRESS GEN REJECTION BYPASS" actuated. Main Turbine on line.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA)
c. Simulator Recorder Data.

TEST PROCEDURE:

1. Initialize the trainer and adjust Reactor power to the maximum point where a reactor scram will not occur directly from a turbine trip.
2. Manually actuate a Main Turbine trip and verify a reactor scram is not received directly from the turbine trip.
3. Observe reactor scram parameters and verify that a reactor scram is received from reactor high pressure a short time following the turbine trip.
4. Verify no unexpected transients or alarms occur during the test.
5. Collect the required data as delineated on the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor in the hot shutdown condition, all rods inserted. Pressure control maintained by the Turbine Bypass valves.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (Dynode-B)
b. Table Top Discussion Data

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Maximum rate power ramp (100% to 75% to 100%), Test TZ07 Rev. 0

DESCRIPTION:

Reactor power was adjusted from 100% to 75% and back to 100% at the maximum allowable rate utilizing the manual mode of recirculation flow control.

TEST DATE: November 14, 1990

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Rapidly reduce both Reactor Recirculation pump speeds to establish approximately 75% power; allow adequate time for all parameters to stabilize.
3. Rapidly increase both Reactor Recirculation pump speeds to establish 100% power; allow adequate time for all parameters to stabilize.
4. Verify no unexpected transients or alarms occur.
5. Collect the required data as delineated by the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

The reactor will be at 100% power, all conditions normal.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (2-D graphs).
b. Table Top Discussion Data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

TEST TITLE: Maximum size reactor coolant system rupture coincident with loss of offsite power. Test TZ08 Rev. 0

DESCRIPTION:

A design basis loss of coolant accident (LOCA) coincident with a loss of offsite power was actuated. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE:

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% reactor power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Initiate Mal. RR03A (RR Loop Rupture) at 100% severity and Mal. ED12 (Loss of Offsite Power) simultaneously.
3. Perform no immediate operator actions.
4. After reactor parameters have stabilized and reactor water level has been restored, collect data as delineated in the test procedure.
5. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor shutdown, all rods inserted. Reactor water level restored.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (2-D graphs).
b. Table top Discussion Data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Maximum size unisolable Main Steam Line Rupture, Test TZ09 **Rev.** 0

DESCRIPTION:

A maximum size unisolable Main Steam line break within the Drywell was affected. All automatic plant interlocks and actions were verified to occur as designed.

TEST DATE:

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% reactor power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder Data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Actuate Malfunction MS04B "Main Steam line rupture in drywell" at 100% severity.
3. Perform no immediate or emergency operator actions.
4. Verify no unexpected transients or alarms occur.
5. After reactor and Primary Containment parameters have stabilized collect data as delineated in the test procedure.
6. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor shutdown, all rods inserted. Primary Containment and reactor parameters stabilized.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (2-D graphs).
b. Table top discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

TEST TITLE: Stuck open relief valve, MSIV isolation, High press ECCS systems inhibited, Test TZ10 **Rev.** 0

TEST DATE:

DESCRIPTION:

A Group 1 isolation accompanied with a stuck open safety relief valve and loss of all high pressure ECCS was affected. All automatic plant interlocks and actions were verified to occur as designed.

REFERENCE: ANSI/ANS 3.5 Section 4.2.1 and Appendix B.1

INITIAL CONDITIONS: 100% reactor power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Simulator computer 2-D graphs.
b. Transient Response Analysis graphs (TRA).
c. Simulator Recorder Data.

TEST PROCEDURE:

1. Initialize the trainer to 100% power, all conditions normal.
2. Place the HPCI Aux. Oil Pump in PTL; place RCIC in the tripped condition; inhibit ADS.
3. Simultaneously actuate Malfunctions PP05A, PP05C and AP01C.
4. Verify all MSIVs close, a reactor scram occurs, and "C" Safety Relief Valve opens and remains open.
5. Verify no High Pressure injection to the vessel occurs.
6. Verify no unexpected transients or alarms occur during the test.
7. After reactor parameters have stabilized collect data as delineated in the test procedure.
8. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST:

Reactor shutdown and slowly depressurizing due to the open safety relief valve.

BASELINE REFERENCE DATA:

a. NSP Nuclear Analysis Dept. "Best Estimate" computer data (2-D graphs).
b. Table top discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Plant Startup - Cold to Hot Standby, Test NPE01 **Rev.** 0
Plant Startup - Hot Stby to Rated Power, Test NPE02
Turbine Startup to Generator Synchronization, Test NPE03

DESCRIPTION:

A normal reactor startup was performed per C.1 Startup Procedures, C.2 Power Operation and S/U checklist 2167 from cold S/D to rated power.

TEST DATE: October 31 through November 1, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS:

The simulator was in cold shutdown condition with most systems secured (IC 3)

DATA COLLECTION METHOD(S): Simulator data was recorded on the S/U checklist 2167.

T PROCEDURE:

A plant startup was performed in accordance with C.1, C.2 and S/U checklist 2167; this checklist was then attached to the completed test forms. All required surveillances were completed as part of the Startup.

FINAL CONDITIONS/DURATION OF TEST: The simulator was at 100% of rated power.

BASELINE REFERENCE DATA: C.1 Startup Procedures, C.2 Power Operation, S/U Checklist 2167.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies were noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Reactor Trip followed by recovery to rated power, Test NPE04 Rev. 0

DESCRIPTION:

The Reactor was scrammed from 100% power with all immediate and subsequent scram actions performed per C.4-A, Reactor Scram. A reactor startup to Hot Standby was performed per C.1, Startup Procedure; subsequently, reactor power was increased to 100% of rated conditions.

TEST DATE: November 19, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS: 100% Reactor power, all conditions normal. (IC 15)

DATA COLLECTION METHOD(S):

The test was conducted in accordance with approved plant procedures; No data collection was necessary.

TEST PROCEDURE:

1. Reactor Scram initiated.
2. Reactor S/U performed to bring the reactor critical.
3. Reactor power increased to the Hot Standby condition and then to 100% of rated conditions.

FINAL CONDITIONS/DURATION OF TEST: The reactor was at 100% of rated conditions.

BASELINE REFERENCE DATA: C.4-A Reactor Scram, C.1 Plant S/U, C.2 Power Operation.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies were noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Operations at Hot Standby, Test NPE05 Rev. 0

DESCRIPTION:

The simulator was initialized to the Hot Standby condition (IC 19) and maintained stable for 30 minutes.

TEST DATE: November 20, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS: Reactor at Hot Standby with the Main Condenser available. (IC19)

DATA COLLECTION METHOD(S): No data collected.

TEST PROCEDURE:

1. The trainer was initialized to IC 19.
2. Plant parameters were allowed to stabilize.
3. Hot Standby conditions were maintained for 30 minutes with all parameters checked for stability.

FINAL CONDITIONS/DURATION OF TEST:

The reactor was in the Hot Standby condition with all parameters stable.

BASELINE REFERENCE DATA:

C.3-0031 - 0033 Shutdown to Hot Standby, Main Condenser available.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies were noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Load Changes, Test NPE06 Rev. 0

DESCRIPTION:

Power adjustments were performed on the simulator in accordance with C.2 section F, Power Operation and C.4-F, Rapid Power Reduction.

TEST DATE: November 20, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS: 100% power, all conditions normal, IC-15.

DATA COLLECTION METHOD(S): No data collected.

TEST PROCEDURE:

1. Reduced reactor power from 100% to 75%.
2. Increased power from 75% to 100%.
3. Reduced Reactor recirculation pump speed from 100% core flow to 30% pump speed.
4. Performed a rapid power reduction to 20% steam flow. (RWM Insert & Withdrawal block.)

FINAL CONDITIONS/DURATION OF TEST:

Simulator at 20% steam flow with a RWM control rod insert and withdrawal block in effect.

BASELINE REFERENCE DATA: C.2 - Power Operation (Section F)
C.4 - Rapid Power Reduction

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

C.2 Section F, Step 4, requires an official 3-D monitor be obtained prior to increasing power above 90% to check thermal limits and the approach to the preconditioned envelope (PCIOMR). The 3-D monicore modification will be completed by July 1, 1991. Until this modification is complete, the previous method utilizing the plant process computer will be used to monitor Thermal Limits and PCIOMR.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Power Operation less than full coolant flow, Test NPE07 **Rev.** 0

DESCRIPTION:

Operation with one and both Reactor Recirculation pumps secured was performed in accordance with approved plant procedures.

TEST DATE: November 20, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolution

INITIAL CONDITIONS: 100% power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): No data collected.

TEST PROCEDURE:

1. Trainer initialized to 100% power.
2. Manually tripped one Reactor Recirculation Pump performing all the immediate and subsequent operator actions for the trip and subsequent restart of the pump. (C.4-B.1.4.A)
3. Returned reactor power to 100%.
4. Manually tripped both Reactor Recirculation Pumps performing all immediate and subsequent operator actions for the trip and subsequent restart of both pumps. (C.4-B.1.4.B)
5. Returned reactor power to 100%.

FINAL CONDITIONS/DURATION OF TEST: The reactor was at 100% of rated power.

BASELINE REFERENCE DATA: C.4-B.1.4.A Trip of one Recirculation Pump.
C.4-B.1.4.B Trip of two Recirculation Pumps.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Plant Shutdown, Test NPE08 **Rev.** 0

DESCRIPTION:

A plant shutdown was performed from 100% of rated power to Hot Standby followed by complete reactor shutdown and cooldown to the cold shutdown condition.

TEST DATE: November 2, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS: 100% reactor power, all conditions normal, IC 15.

DATA COLLECTION METHOD(S): Completed Shutdown Checklist 2204.

TEST PROCEDURE: Performed a plant shutdown per C.3 - Shutdown procedures (Steps 1 to 55).

S
AL CONDITIONS/DURATION OF TEST: Reactor in the cold shutdown condition.

BASELINE REFERENCE DATA: C.3 - Shutdown Procedures.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Heat Balance Date @ 25%, 50%, 75% and 100% power and Core Thermal Performance, Test NPE09 **Rev.** 0

DESCRIPTION:

Four heat balance runs were completed on the simulator at the specified power levels. A Core Thermal Power and APRM Calibration (OD-3) and a Periodic Core Performance log were run at 100% reactor power.

TEST DATE: December 21, 1990 and January 2, 1991

REFERENCE: ANSI 3.5 Section 3.1.1

INITIAL CONDITIONS: Reactor power levels required for the specific test. All conditions normal.

DATA COLLECTION METHOD(S): The following simulator data was collected:

a. Heat Balance data at approximately 25%, 50%, 75% and 100%.
b. Core Thermal Power and APRM Calibration data. (OD-3)
c. Periodic Core Performance Log (P-1)

TEST PROCEDURE:

1. Initialize the trainer to 100% power and run the following Heat Balance Data Runs and Thermal Performance programs:
   a. Heat balance
   b. Core Thermal Power and APRM Calibration Data (OD-3)
   c. Periodic Core Performance Log (P-1)
2. Adjust reactor power level to 75%, 50% and 25% and run a heat balance at each.
3. Compare and interpret data for acceptability.

FINAL CONDITIONS/DURATION OF TEST: N/A

BASELINE REFERENCE DATA:

a. Actual Plant Heat Balance Data from cycle 14 (Nov. 89-Jan. 91)
b. Table Top Discussion data.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No Deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

10000850

CERTIFICATION TEST ABSTRACT

TEST TITLE: Surveillance testing on safety-related equipment Rev. 0
Test NPE10

DESCRIPTION:

Safety related equipment surveillance tests were conducted over a period of time and reviewed November 21, 1990 for content and accuracy.

TEST DATE: November 21, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.1 - Normal Plant Evolutions

INITIAL CONDITIONS: Various initial conditions as outlined in the specific test.

DATA COLLECTION METHOD(S): Completed surveillance test procedure.

TEST PROCEDURE: Perform the following surveillances:

a. 0012 APRM/FLOW
b. 0187 STBY DIESEL GEN/ESW
c. 0253 STBY GAS OPERABILITY
d. 0255-3-1A CORE SPRAY SYSTEM
e. 0255-4-1A RHR PUMP AND VALVE
f. 0255-6-1A HPCI SYSTEM PUMP AND VALVE
g. 0255-8-1A RCIC SYSTEM PUMP AND VALVE
h. 0015a WEEKLY MAIN STEAM LINE MONITOR FUNCTIONAL
j. 0042 IRM FUNCTIONAL

FINAL CONDITIONS/DURATION OF TEST:

Various plant conditions depending on the specific test.

BASELINE REFERENCE DATA: Criteria outlined in the specific test.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT

TEST TITLE: Steady State Performance Test US02 A, B, C, D

DESCRIPTION:

Simulator performance data was collected at four separate power levels and compared to previously collected plant data.

TEST DATE: October 23, 1990 (100%), November 2, 1990 (50%), November 29, 1990 (25%, 75%)

REFERENCE: ANSI/ANS 3.5 Appendix B.1.1

INITIAL CONDITIONS:

Initial conditions will reflect the individual test power level required.

DATA COLLECTION METHOD(S):

Plant data was collected and recorded following the last refuel outage for power levels <100% and later in the cycle for 100% Rx power. Simulator data was collected from panel indicators and the process computer and transferred to Table US02 1 (attached) of the Steady State Performance Test Form.

TEST PROCEDURE:

The simulator was initialized and adjusted to the desired test conditions; test data was then recorded and compared to corresponding plant data.

FINAL CONDITIONS/DURATION OF TEST:

Simulator conditions remained essentially unchanged for the duration of the test.

BASELINE REFERENCE DATA:

Actual plant data collected during initial plant startup and later in core life (cycle 14).

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

Reactor Recirc pumps electrical power were out of spec at 25%, 50% and 100% Rx power (DR-90-226) and was not significant enough to fail the test because it does not adversely effect training. The DR will be corrected by March 1, 1991.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

STEADY STATE PERFORMANCE TEST

Simulator IC# & Load _____ Test Date _____

Core Life BOC MOC EOC

PARAMETER	INITIAL VALUE	10 MIN	20 MIN	30 MIN	40 MIN	50 MIN	60 MIN	% DRIFT
*Neutron Flux								
*Core Thermal Power								
*"A" Recirc Loop Flow								
*"B" Recirc Loop Flow								
*Total Recirc Loop Flow								
RR A Pump Pwr								
B Pump Pwr								
*Total Core Flow								
*Total Steam Flow								
FDW Temp.								
*RPV Level								
*Reactor Pressure (steam dome)								
CRDH Flow								
CRDH Temp.								

Table US02

STEADY STATE PERFORMANCE TEST (Cont'd)

PARAMETER	INITIAL VALUE	10 MIN	20 MIN	30 MIN	40 MIN	50 MIN	60 MIN	% DRIFT
*Total Feed Flow								
RWCU Inlet Flow								
RWCU Inlet Temp.								
RWCU Return Temp.								
*Gen Output								
*Gen Frequency								
Gen Reactive Pwr								
ywell Pressure								
*Torus Pressure								
Turbine Steam Chest Pressure								
*Cond Vacuum								

Comments:

Table US02 (Cont'd)

CERTIFICATION TEST ABSTRACT

TEST TITLE: 100% Stability US01 Rev. 0

DESCRIPTION:

Simulator performance data was collected over a one(1) hour period at 10 minute intervals with the readings compared for stability.

TEST DATE: October 24, 1990

REFERENCE: ANSI/ANS 3.5 Appendix B.1.1

INITIAL CONDITIONS:

The simulator was initialized at 100% Reactor power and allowed to stabilize.

DATA COLLECTION METHOD(S):

Simulator data was collected from panel indicators and the process computer (SPDS) and transferred to Table US01 (attached) of the Steady State Performance Test form.

TEST PROCEDURE:

The simulator was initialized and adjusted to 100% power; test data was collected initially and at 10 minute intervals for a 60 minute period. The data was evaluated for simulator stability over the entire 60 minute time period.

FINAL CONDITIONS/DURATION OF TEST:

Simulator conditions remained unchanged for the entire test.

BASELINE REFERENCE DATA: N/A. Simulator data only.

TEST DEFICIENCIES/CORRECTIVE ACTIONS: No deficiencies were noted.

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

CERTIFICATION TEST ABSTRACT
STEADY STATE PERFORMANCE TEST

Initial power level _____ % Test Date _____

PARAMETER	SIMULATOR DATA	PLANT DATA	% MISMATCH
Core Life (BOC-MOC-EOC)	_____	_____	_____
Neutron Flux	_____ %	_____ %	_____
Core Thermal Power	_____ %	_____ %	_____
"A" Recirculation Loop Flow	_____ Mlb/hr	_____ Mlb/hr	_____
"B" Recirculation Loop Flow	_____ Mlb/hr	_____ Mlb/hr	_____
Total Recirculation Loop Flow	_____ Mlb/hr	_____ Mlb/hr	_____
Total Core Flow	_____ Mlb/hr	_____ Mlb/hr	_____
Total Steam Flow	_____ Mlb/hr	_____ Mlb/hr	_____
Total Feed Flow	_____ Mlb/hr	_____ Mlb/hr	_____
Feedwater Temp.	_____ Deg F	_____ Deg F	_____
RPV Level	_____ Inches	_____ Inches	_____
Reactor Pressure (steam dome)	_____ psig	_____ psig	_____
CRDH Flow	_____ GPM	_____ GPM	_____
CRDH Temp.	_____ Deg F	_____ Deg F	_____
RWCU Inlet Flow	_____ GPM	_____ GPM	_____
RWCU Inlet Temp.	_____ Deg F	_____ Deg F	_____
RWCU Return Temp.	_____ Deg F	_____ Deg F	_____

CERTIFICATION TEST ABSTRACT

Generator Output	_____MW	_____MW	_____
Generator Frequency	_____Hz	_____Hz	_____
Generator Reactive Power	_____MVARS	_____MVARS	_____
Drywell Pressure	_____psig	_____psig	_____
Drywell Temperature	_____Deg F	_____Deg F	_____
Torus Pressure	_____psig	_____psig	_____
Torus Temperature	_____Deg F	_____Deg F	_____
Turbine Steam Flow	_____Mlb/hr	_____Mlb/hr	_____
Condenser Vacuum	_____In. Hg	_____In. Hg	_____

CERTIFICATION TEST ABSTRACT

TEST TITLE: Malfunction Tests

DESCRIPTION:

A malfunction test was written and performed for each malfunction listed on Appendix 9. A sample malfunction test is included as Appendix 10. All malfunction tests were reviewed by at least two members of the Certification Review Group identified in Appendix 12.

DATES: December 10, 1988 to November 21, 1990

REFERENCE: ANSI/ANS 3.5 Section 3.1.2, Plant Malfunctions

INITIAL CONDITIONS:

Initial conditions varied depending on the specific malfunction being tested.

DATA COLLECTION METHOD(S):

a. Safety Parameter Display System (SPDS)
b. Alarm Typer
c. Manually where applicable

TEST PROCEDURE:

Each malfunction was tested using a customized malfunction test procedure.

BASELINE REFERENCE DATA:

a. Malfunction Cause & Effects
b. Controlled Monticello Plant Elementary Drawings
c. Monticello Nuclear Generating Plant Operations Manuals
d. Actual Plant Operating Experiences

TEST DEFICIENCIES/CORRECTIVE ACTIONS:

Simulator Discrepancy reports were written, problems corrected and tests conducted satisfactorily for all except two malfunction tests. The following malfunction tests are considered unsatisfactory; they will be corrected by July 1, 199I:

DR90083 - RH03A(B): RHR HX 11 (12) TUBE/SHELL LOW DIFFERENTIAL PRESSURE
DR90201 - RM01Q: PROCESS RADIATION MONITOR HIGH RADIATION

EXCEPTIONS TO ANSI/ANS-3.5-1985 TAKEN: None

MONTICELLO SIMULATOR CERTIFICATION REPORT
LIST OF CERTIFICATION TESTS
APPENDIX #9

Test Number	Test Type	Title	Date Complete	Test Status	ANS 3.5 Reference X=Section 3.1.2
AP01	MALF	SRV FAIL OPEN	12/10/88	S	X.1.d
AP02	MALF	SPURIOUS ADS ACTUATE	12/15/88	S	X.23
AP03	MALF	SRV LEAK	01/06/89	S	X.1.d
AP04	MALF	SRV FAIL IN SAFE MOD	01/07/89	S	X.23
AP05	MALF	SRV FAIL TO RESEAT	01/07/89	S	X.23
AP06	MALF	ADS AUTO INIT FAIL	01/17/89	S	X.23
CH01	MALF	CNTRL ROD DRIFTS OUT	01/20/89	S	X.12
CH02	MALF	CONTROL ROD STUCK	01/20/89	S	X.12,13
CH03	MALF	CNTRL ROD UNCOUPLED	01/20/89	S	X.12
CH04	MALF	CNTRL ROD ACCUM TRBL	01/20/89	S	X.12
CH05	MALF	CNTRL ROD SCRAM	01/20/89	S	X.12
CH06	MALF	CNTRL ROD OUT VLV LK	01/20/89	S	X.12
CH07	MALF	CRD CNTRL FLO VLV	01/20/89	S	X.12
CH08	MALF	CRD PMP,BKR TRIP	01/20/89	S	X.12
CH09	MALF	CNTRL ROD DR,SEALS	01/20/89	S	X.12
CH10	MALF	RPIS POWER FAIL	01/20/89	S	X.12,13
CH11	MALF	RMCS TIMER	03/31/90	S	X.12,13
CH12	MALF	CNTR RD FAIL DESELCT	03/31/90	S	X.12,13
CH13	MALF	FAIL RMC SYST	03/31/90	S	X.12,13
CH14	MALF	REED SW FAIL	03/31/90	S	X.12.13
CH15	MALF	RELIEF VLV FAIL OPEN	03/31/90	S	X.12,13
CH16	MALF	ROD FAIL TO INSERT	03/31/90	S	X.12,13
CH17	MALF	SDV ISO VLV FAIL	03/31/90	S	X.12,19
CH18	MALF	ATWS FAIL	03/31/90	S	X.17
CH19	MALF	MULT STUCK RODS	03/31/90	S	X.12
CH20	MALF	BLOWN SCRAM FUSE A	08/08/90	S	X.12
CH21	MALF	BLOWN SCRAM FUSE B	08/08/90	S	X.12
CS01	MALF	CS PMP #11 TRIP	04/17/90	S	X.23
CS02	MALF	CS OUTBRD VLV FAIL	04/17/90	S	X.7,23
CS03	MALF	CS PIP A BREAK	04/17/90	S	X.7,23
CW01	MALF	CIRC PMP #11 VIBRATE	04/18/90	S	X.5,6,8
CW02	MALF	CIRC PMP #11 TRIP	04/19/90	S	X.5,6,8
CW03	MALF	PMP #11 LO BASIN LVL	04/19/90	S	X.5,6,8
CW04	MALF	PMP #11 PIT FLOOD	04/19/90	S	X.5,6,8
CW05	MALF	COOL TWR PMP 11 VIBR	04/19/90	S	X.5,6
CW06	MALF	COOL TWR PMP 11 TRIP	04/23/90	S	X.5,6
CW07	MALF	COOL TWR FAN A TRIP	04/23/90	S	X.5,6
CW08	MALF	CONDENSER PIT FLOOD	04/23/90	S	X.5,6
DG01	MALF	DSL GEN #11 TRIP	04/23/90	S	X.3,23
DG02	MALF	DSL GEN 11 FAIL STAR	04/23/90	S	X.3,23
DG03	MALF	DSL GEN 11 AUTO STAR	04/23/90	S	X.3,23
DG04	MALF	#13 DSL GEN TRIP	05/15/90	S	X.3
DG05	MALF	FAIL #13 GEN TO LOAD	04/23/90	S	X.3
ED04A	MALF	LOSS GEN MAIN TRANS	04/24/90	S	X.3
ED04B	MALF	LOSS 1AR TRANS	04/24/90	S	X.3
ED04C	MALF	LOSS 1R TRANS	04/12/90	S	X.3
ED04D	MALF	LOSS 2R TRANS	04/24/90	S	X.3

MONTICELLO SIMULATOR CERTIFICATION REPORT
LIST OF CERTIFICATION TESTS
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Test Number	Test Type	Title	Date Complete	Test Status	ANS 3.5 Reference X=Section 3.1.2
ED04E	MALF	LOSS 2RS TRANS	04/24/90	S	X.3
ED04F	MALF	LOSS 1ARS TRANS	04/25/90	S	X.3
ED05A	MALF	BUS 11 LOCKOUT	04/25/90	S	X.3
ED05B	MALF	BUS 12 LOCKOUT	04/25/90	S	X.3
ED05C	MALF	BUS 13 LOCKOUT	04/25/90	S	X.3
ED05D	MALF	BUS 14 LOCKOUT	04/25/90	S	X.3
ED05E	MALF	BUS 15 LOCKOUT	04/25/90	S	X.3
ED05F	MALF	BUS 16 LOCKOUT	04/25/90	S	X.3
ED06A	MALF	LOSS LC 101	04/26/90	S	X.3
ED06B	MALF	LOSS LC 102	04/26/90	S	X.3
ED06C	MALF	LOSS LC 103	04/26/90	S	X.3
ED06D	MALF	LOSS LC 104	04/26/90	S	X.3
ED06E	MALF	LOSS LC 105	05/14/90	S	X.3
ED06F	MALF	LOSS LC 106	04/26/90	S	X.3
ED06G	MALF	LOSS LC 109	04/26/90	S	X.3
ED07	MALF	LOSS 250VDC DIV I	04/26/90	S	X.3
[illegible]08	MALF	LOSS 125VDC BUS II	04/26/90	S	X.3
[illegible]19	MALF	LOSS 24VDC BATTRY 15	04/26/90	S	X.3
[illegible]10A	MALF	LOSS Y10	05/01/90	S	X.3
ED10B	MALF	LOSS Y30	05/14/90	S	X.3
ED10C	MALF	LOSS Y70	05/01/90	S	X.3
ED10D	MALF	LOSS Y80	05/02/90	S	X.3
ED11A	MALF	LOSS Y20	05/02/90	S	X.3
ED11B	MALF	LOSS Y25	05/02/90	S	X.3
ED11C	MALF	LOSS Y26	05/02/90	S	X.3
ED12	MALF	LOSS OFFSITE POWER	07/19/90	S	X.3
ED13	MALF	NETWORK LOAD DECREAS	05/01/90	S	X.3
ED14	MALF	NETWORK LOAD INCREAS	05/01/90	S	X.3
ED15	MALF	MN TRANSF FAN FAIL	05/01/90	S	X.3
ED16	MALF	2R COOL FAN FAIL	05/01/90	S	X.3
ED19	MALF	1R DEGRADED VOLTAGE	05/01/90	S	X.3
ED20	MALF	Y91 INVERTER FAIL	05/01/90	S	X.3
ED21	MALF	FAIL 17 BATTERY	05/01/90	S	X.3
EG01	MALF	LOSS STATOR COOLING	05/02/90	S	X.6
EG02	MALF	STATOR COOL PMP TRIP	05/16/90	S	X.6
EG03	MALF	GEN LOCKOUT	05/02/90	S	X.16
EG04	MALF	ISOPH BUS FAN TRP	05/02/90	S	X.16
EG05A	MALF	GEN VOLT REG LOW	05/02/90	S	X.16
EG05B	MALF	GEN VOLT REG HIGH	05/02/90	S	X.16
EG06	MALF	LOSS GEN FIELD	05/21/90	S	X.16
EG07	MALF	GEN MAX EXCITATION	05/02/90	S	X.16
EG08	MALF	GEN HYDRO LEAKAGE	05/02/90	S	X.16
[illegible]W03	MALF	CONDNSTE PMP 11 TRIP	10/15/90	S	X.9,10
[illegible]04	MALF	CONDENSAT PMP HI VIB	05/04/90	S	X.9,10
[illegible]W06	MALF	CND REC VLV FAIL OPN	05/04/90	S	X.9,10
FW07	MALF	COND DEM 11 RES DEPL	05/04/90	S	X.9,10
FW08	MALF	COND DEMN #11 HI D/P	05/07/90	S	X.9,10

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FW09	MALF	DEMN MSTR FLOW FAILS	05/07/90	S	X.9,10
FW10	MALF	DEMN RES RETEN FAIL	05/07/90	S	X.9,10
FW11	MALF	EXH HOOD SPR VLV FAL	05/07/90	S	X.9,15
FW12	MALF	HTR DRN TNK HI LVL	05/07/90	S	X.9
FW14	MALF	LO PRS FW HTR TUB LK	05/07/90	S	X.9
FW15	MALF	FW PMP BEAR HI TEMP	05/07/90	S	X.9
FW16	MALF	REACT FDPMP #11 TRIP	05/07/90	S	X.9
FW17	MALF	FW RECIRC VLV FAILS	05/07/90	S	X.9
FW19	MALF	HI PRS FW HTR TUB LK	05/08/90	S	X.9
FW20	MALF	LOSS AIR FW REG VLV	05/08/90	S	X.9
FW21	MALF	FAIL REG VLV M/A CNT	05/08/90	S	X.9
FW23	MALF	FAIL SHFT 3-1 ELEMNT	05/08/90	S	X.9
FW24	MALF	FAIL FW FLO TRANSMIT	05/08/90	S	X.9
FW25	MALF	FW PIP BRK/PRIM CONT	10/30/90	S	X.9,20
FW26	MALF	FW LOOPBRK/PRIM CONT	10/30/90	S	X.9,20
HP01	MALF	HPCI AUTO INIT	05/09/90	S	X.10,23
HP02	MALF	HPCI AUTO-STRT FAIL	05/09/90	S	X.10,23
HP03	MALF	HPCI TURBINE TRIP	05/09/90	S	X.10,23
HP04	MALF	HPCI SPD CNT FAIL HI	05/09/90	S	X.10,23
HP05	MALF	HPCI AUTO-ISO	05/09/90	S	X.10,23
HP06	MALF	LOSS COOL-GALND SEAL	05/09/90	S	X.10,23
HP07	MALF	HPCI STEAM LINE LEAK	05/09/90	S	X.10,20,23
HP08	MALF	FAIL HPCI AUTO ISOL	08/01/90	S	X.23
IA01	MALF	SERV AIR COMPR TRIP	09/06/90	S	X.2
IA02	MALF	SERV AIR ISO	05/10/90	S	X.2
IA03	MALF	AIR COMP FAIL LOAD	05/10/90	S	X.2
IA04	MALF	IA HDR FAIL:RX BUILD	05/10/90	S	X.2
IA05	MALF	DW IA LINE RUPTURE	05/10/90	S	X.2
IA06	MALF	DECR SA LINE PRESS	05/10/90	S	X.2
MC01	MALF	LO PRS CNDS TUBE LEK	05/12/90	S	X.5
MC02	MALF	LO PRS CNDS TUBE RUP	05/12/90	S	X.5
MC03	MALF	CNDS AIR IN-LEAK	05/14/90	S	X.5
MC04	MALF	SJAE PRS CONT VLV FL	05/14/90	S	X.5
MC05	MALF	SJAE SUCT VLV AUTO	05/21/90	S	X.5
MS01	MALF	MSIV INBRD FAIL CLOS	05/15/90	S	X.17,23,25
MS02	MALF	MSIV OUTBRD FAL CLOS	05/15/90	S	X.17,23,25
MS03	MALF	MN STM LN B RUP TUNN	05/15/90	S	X.1.b,20
MS04A	MALF	MN STM LN RUP DW A	10/06/90	S	X.1.b,20
MS04B	MALF	MN STM LN RUP DW B	10/06/90	S	X.25
MS05	MALF	MSIV INBRD FAIL CLOS	05/15/90	S	X.25
MS06	MALF	MSIV OTBRD FAIL CLOS	05/15/90	S	X.25
MS07	MALF	MSIV DISC SEP FRM OP	05/15/90	S	X.25
HP08	MALF	TURB STM SEAL REG/HI	05/15/90	S	X.5
HP09	MALF	STM PKG EXH MTR TRIP	05/15/90	S	X.5
HP00	MALF	FAIL MN STM FLO TRNS	05/15/90	S	X.25
MS11	MALF	MAIN STM LINE RUPTUR	10/06/90	S	X.20
NI01	MALF	SRM CH FAIL DWNSCALE	05/16/90	S	X.21

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NI02	MALF	SRM CH FAIL FULSCALE	05/16/90	S	X.21
NI03	MALF	SRM CH INOPERATIVE	05/16/90	S	X.21
NI04	MALF	SRM CH DTECT STUCK	05/16/90	S	X.21
NI05	MALF	IRM CH DWNSCALE	05/16/90	S	X.21
NI06	MALF	IRM CH FULLSCALE	05/16/90	S	X.21
NI07	MALF	IRM CH INOPERATIVE	05/16/90	S	X.21
NI08	MALF	IRM CH DETECT STUCK	05/16/90	S	X.21
NI09	MALF	IRM CH SPUR INDICT	05/16/90	S	X.21
NI10	MALF	LPRM FAIL DWNSCALE	05/20/90	S	X.21
NI11	MALF	LPRM FAIL FULLSCALE	10/30/90	S	X.21
NI12	MALF	APRM CH DOWNSCALE	05/22/90	S	X.21
NI13	MALF	APRM CH FAIL FULSCAL	05/22/90	S	X.21
NI14	MALF	APRM INOPERATIVE	05/22/90	S	X.21
NI15	MALF	RBM CH FAIL DWNSCALE	05/22/90	S	X.21
NI16	MALF	RBM CH FAIL UPSCALE	05/22/90	S	X.21
NI17	MALF	RBM CH INOPERATIVE	05/22/90	S	X.21
NPE01	NORM	S/U COLD-HOT STANDBY	11/01/90	S	3.1.1(1)
NPE02	NORM	S/U HOT-FULL POWER	11/01/90	S	3.1.1(2)
NPE03	NORM	TURB & GEN S/U & SYN	11/01/90	S	3.1.1(3)
NPE04	NORM	RX TRIP-RATED POWER	11/19/90	S	3.1.1(4)
NPE05	NORM	OPS IN HOT STANDBY	11/20/90	S	3.1.1(5)
NPE06	NORM	LOAD CHANGES	11/20/90	S	3.1.1(6)
NPE07	NORM	OPS < FULL CORE FLOW	11/20/90	S	3.1.1(7)
NPE08	NORM	S/D FULL-HOT-COLD	11/02/90	S	3.1.1(8)
NPE09	NORM	CORE PERFOMANCE TEST	01/02/91	S	3.1.1(9)
NPE10	NORM	SURVALLENCES	11/21/90	S	3.1.1(10)
OG01	MALF	AIR EJECT DISCH BURN	05/12/90	S	X.22
OG02	MALF	OG EXPLOSION	05/12/90	S	X.22
OG03	MALF	OG RECOMB TEMP LOW	05/12/90	S	X.22
OG05	MALF	OG COMPRSS FAIL	05/12/90	S	X.22
OG06	MALF	OG TRN HI H2 OUT IND	05/12/90	S	X.22
OG07	MALF	RECOMB TRN LO STMFLO	05/12/90	S	X.22
PC01	MALF	SBGT EXH FAN TRIP	05/23/90	S	X.22,23
PC02	MALF	SPUR SECOND CONT ISO	05/23/90	S	X.22,23
PC03	MALF	DRWELL IA SYS FAIL	05/23/90	S	X.22,23
PC04	MALF	DRWELL COOL CIRC FAN	05/23/90	S	X.22,23
PC06	MALF	SBGT HIGH TEMP	05/23/90	S	X.22,23
PC07	MALF	FAIL DRWELL TO TORUS	05/23/90	S	X.22,23
PC09	MALF	SRV LINE BREAK	05/23/90	S	X.22,23
PP01	MALF	LOSS OF RPS-MG SET	07/08/90	S	X.11
PP03	MALF	RPS SUBCHNNL FAIL	07/19/90	S	X.11
PP04	MALF	AUTO SCRAM FAIL	07/19/90	S	X.11,24
PP05	MALF	SPUR GP 1 ISO TRIP	08/13/90	S	X.11,23
PP06	MALF	FAIL OF MODE SWITCH	08/09/90	S	X.11,23,24
RC01	MALF	RCIC AUTO-START FAIL	05/24/90	S	X.10,17,23
RC02	MALF	RCIC AUTO INITIATION	05/23/90	S	X.17,23
RC03	MALF	RCIC TURBINE TRIP	05/23/90	S	X.10,17,23

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RC04	MALF	RCIC ISOLATION SIGN	05/24/90	S	X.10,17,23
RC05	MALF	RCIC SPEED CONT FAIL	05/23/90	S	X.10,17,23
RC06	MALF	RCIC LUBE OIL COOLER	05/23/90	S	X.10,17,23
RC07	MALF	RCIC STEAM BREAK	05/24/90	S	X.1.b,10,17
RC08	MALF	FAIL RCIC AUTO ISOL	08/13/90	S	X.23
RH01	MALF	RHR PUMP TRIP	05/24/90	S	X.7,17
RH02	MALF	RHR HEAT EX TUBE LK	05/24/90	S	X.7,17
RH03	MALF	RHR HEAT LOW DIFF	05/24/90	U	X.7,17
RH04	MALF	RHR SHUT ISOL SIGNAL	05/24/90	S	X.7,17
RH05	MALF	RHR MIN FLOW VALVE	05/24/90	S	X.7,17
RH06	MALF	RHR CNTR VLV FAILS	05/24/90	S	X.7,17
RM01	MALF	PRM HIGH RAD	10/10/90	U	X.22
RM02	MALF	PRM DOWNSCALE	01/11/91	S	X.22
RM03	MALF	ARM HIGH RAD	11/21/90	S	X.22
RM04	MALF	ARM DOWNSCALE	10/12/90	S	X.22
RR01	MALF	SMALL RECIRC BREAK	10/03/90	S	X.1.b
RR02	MALF	RR JET PUMP RISER BK	10/05/90	S	X.1.b,1.c
RR03	MALF	RR LOOP RUPTURE	10/05/90	S	X.1.b,1.c
RR04	MALF	INSTR LINE RUPTURE	10/03/90	S	X.1.b
RR05	MALF	RX RECIRC PUMP LOCK	05/29/90	S	X.4
RR06	MALF	RX RECIRC SEIZURE	05/30/90	S	X.4
RR07	MALF	RX PUMP TEMP HIGH	05/30/90	S	X.4
RR08	MALF	RX HIGH VIBRATION	08/08/90	S	X.4
RR09	MALF	RX PUMP RUN AWAY	05/30/90	S	X.4,17
RR10	MALF	RX MG BREAKER TRIP	05/30/90	S	X.4
RR11	MALF	RX INCOMP START	05/30/90	S	X.4,17
RR12	MALF	FAULTY TEMP SIGNAL	08/09/90	S	X.4
RR13	MALF	RECIRC SPEED FAILURE	05/30/90	S	X.4,17
RR14	MALF	RECIRC CONTROL FAILS	05/30/90	S	X.4,17
RR15	MALF	RX INSTR FAILURE	05/31/90	S	X.4
RR16	MALF	RECIRC SEAL FAILURE	05/31/90	S	X.4,1.b,1.c
RR17	MALF	RECIRC SEAL FAILURE	05/31/90	S	X.4,1.b,1.c
RR18	MALF	INSTR JET PUMP FAIL	09/29/90	S	X.22
RR19	MALF	NON INSTR PUMP FAIL	06/12/90	S	X.22
RR20	MALF	ATWS TRIP	07/10/90	S	X.17,23,24
RR21	MALF	RECIRC LINE BREAK	07/10/90	S	X.1.b,1.c
RR22	MALF	RECIRC OIL PUMP TRIP	07/10/90	S	X.4
RR23	MALF	ATWS FAILURE	08/13/90	S	X.24
RR24	MALF	FAIL WR TRANSMITTER	09/24/90	S	X.22,23
RR25	MALF	FAIL NR TRANSMITTER	09/24/90	S	X.22,23
RR27	MALF	RCP SPEED CONTR FAIL	06/12/90	S	X.4,17
RU01	MALF	RWCU TRIP	05/29/90	S	X.22,23
RU02	MALF	RWCU FILTER PRESSURE	05/25/90	S	X.22,23
RU03	MALF	NON HEAT EX TEMP	05/29/90	S	X.22,23
RU04	MALF	RWCU RESIN DEPLETION	05/29/90	S	X.22,23
RU05	MALF	RWCU VALVE STICKS	05/29/90	S	X.22,23
RU06	MALF	RWCU EXCESS VALVE	05/29/90	S	X.22,23

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RU07	MALF	FAIL RWCU SUCTION	05/29/90	S	X.22,23
RU08	MALF	FAIL RWCU AUTO ISOL	08/09/90	S	X.22,23
RW01	MALF	RWM EQUP FAILURE	09/29/90	S	X.12,13,23
RW02	MALF	RWM ALARM FAILURE	09/29/90	S	X.12,13,23
RW03	MALF	RWM FAIL ROD BLOCKS	08/12/90	S	X.12,12,23
RX01	MALF	FUEL FAILURE	10/01/90	S	X.14
RX02	MALF	INCREASE CNTR ROD	10/05/90	S	X.12
SL01	MALF	SBLC PUMP TRIP	06/13/90	S	X.17
SL02	MALF	LOSS SQUIB CONT	06/13/90	S	X.17
SW01	MALF	RBCCW PUMP TRIP	06/13/90	S	X.6
SW02	MALF	RBCCW LEAK DRYWELL	06/13/90	S	X.6
SW03	MALF	SERV WATER PUMP TRIP	06/13/90	S	X.6
SW04	MALF	EMERG PUMP TRIP	06/13/90	S	X.6
SW05	MALF	RHR/SW PUMP TRIP	06/15/90	S	X.6
SW06	MALF	RBCCW HEAT EX LEAK	06/15/90	S	X.6
TC01	MALF	TURB CNTR UNIT FAILS	06/16/90	S	X.15,25
TC02	MALF	TURBINE MASTER TRIP	06/16/90	S	X.15,25
TC03	MALF	MECH PRESS REG FAIL	06/16/90	S	X.25
TC04	MALF	ELEC REG FAILS	06/16/90	S	X.25
TC05	MALF	MECH REG OSCILLATION	06/16/90	S	X.25
TC06	MALF	TURBINE VALVE STUCK	06/16/90	S	X.25
TC07	MALF	TURB VALVE FAILS	06/16/90	S	X.25
TC08	MALF	TURBINE VALVE FAILS	06/16/90	S	X.25
TC09	MALF	TURBINE STOP FAILS	08/30/90	S	X.25
TU01	MALF	EPR OIL PUMP TRIP	06/16/90	S	X.22,25
TU02A	MALF	TURB BEAR HIGH TURB	07/17/90	S	X.15,22
TU02B	MALF	TURB BEAR HIGH GEN	07/23/90	S	X.15,22
TU03	MALF	SHAFT BEAR HIGH VIB	07/17/90	S	X.15,22
TU04	MALF	TURBINE GEN TEMP HI	07/18/90	S	X.15,22
TU05	MALF	LOSS OIL PRESSURE	06/16/90	S	X.15,22
TU06	MALF	TURBINE OIL LOW PRES	06/16/90	S	X.15,22
TZ01	TRAN	MANUAL SCRAM	11/20/90	S	B.1.2(1)
TZ02	TRAN	TRIP ALL RFW PUMPS	11/13/90	S	B.2.1(2)
TZ03	TRAN	CLOSE ALL MSIVS	11/14/90	S	B.2.1(3)
TZ04	TRAN	TRIP ALL RECIRC PUMP	11/21/90	S	B.2.1(4)
TZ05	TRAN	ONE RECIRC PUMP TRIP	11/14/90	S	B.2.1(5)
TZ06	TRAN	TURB TRIP	01/21/91	S	B.2.1(6)
TZ07	TRAN	MAX POWER RAMP	11/14/90	S	B.2.1(7)
TZ08	TRAN	DBA LOCA W/LOSS AC	01/22/91	S	B.2.1(8)
TZ09	TRAN	MAX MS LINE RUPTURE	01/19/91	S	B.2.1(9)
TZ10	TRAN	MSIV W STUCK SRV	01/19/91	S	B.2.1(10)
US01	SSSS	STABILITY 100%	10/24/90	S	4.1,B.1.1
US02A	SSSS	PWR 100% HEAT BAL	10/19/90	S	4.1,B.1.1
US02B	SSSS	PWR 75% HEAT BAL	11/29/90	S	4.1,B.1.1
US02C	SSSS	PWR 50% HEAT BAL	11/02/90	S	4.1,B.1.1
US02D	SSSS	PWR 25% HEAT BAL	11/29/90	S	4.1,B.1.1
XX01	COMP	COMP REAL TIME	11/04/90	S	A3.(1)

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Test Number	Test Type	Title	Date Complete	Test Status	ANS 3.5 Reference X=Section 3.1.2
XX02	COMP	I/O OVERRIDE TEST	12/01/90	S	3.3.2
XX03	ENVR	SIMULATOR LIGHTING	08/23/90	S	3.2.3
XX04	ENVR	SIMULATOR SOUND LVL	06/01/90	S	3.2.3
XX05	ENVR	Panel Physical Fidel	08/03/90	S	3.2.1,3.2.2

MONTICELLO SIMULATOR CERTIFICATION REPORT
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SYSTEM CODES

CODE	SYSTEM
AN	ANNUNCIATORS
AP	AUTO PRESSURE RELIEF (SRV'S)
CG	COMBUSTION GAS CONTROL
CH	CONTROL ROD DRIVE HYDRALICS
CS	CORE SPRAY
CW	CIRC WATER
DG	DIESEL GENERATOR
ED	ELECTRICAL DISTRIBUTION
EG	ELECTRICAL GENERATION
FP	FIRE PROTECTION
FW	FEED & CONDENSATE WATER
HP	HIGH PRESSURE INJECTION
HV	HEAT & VENTILATION
IA	INSTRUMENT AIR
LD	LEAK DETECTION
MC	MAIN CONDENSER
MS	MAIN STEAM
NI	NUCLEAR INSTRUMENTATION
OD	ON DEMAND PROGRAMS PO
OG	OFF-GAS
PC	PRIMARY CONTAINMENT
PO	PROCESS COMPUTER
PP	REACTOR PROTECTION
RC	RCIC
RH	RHR
RM	RADIATION MONITOR
RR	REACTOR RECIRC
RU	REACTOR WATER CLEANUP
RW	ROD WORTH MINIMIZER
RX	REACTOR
SL	STANDBY LIQUID CONTROL
SW	SERVICE WATER
TC	TURBINE CONTROL
TU	TURBINE

TEST CODES

SYSTEM CODE	TEST CODE	TEST TYPE
aanna	MALF	Malfunction
NPEnn	NORM	Normal plant evolutions
TZnn	TRAN	Transients ANSI 3.5 Appendix B
USnn	SSSS	Steady State & Heat Balance
XXnn	COMP	Computer & Simulator Controls
XXnn	ENVR	Simulator Environment

a=Alphabetical character
n=numerical character

MONTICELLO SIMULATOR CERTIFICATION REPORT

APPENDIX #10

MALFUNCTION TEST REPORT

TEST REV.: 0

MALFUNCTION: ED04A - Loss of No. 1 Generator Transformer

SYSTEM: Electrical Distribution

SELECTABLE: Yes _____ No __X__ **CLEARABLE:** Yes __X__ No _____

VARIABLE: Yes _____ No __X__

TEST RESULTS ACCEPTABLE: Yes _____ No _____ **DRs WRITTEN:**

UNACCEPTABLE RESPONSE:

BASIS FOR BEST ESTIMATE RESULT: Simulator Cause & Effects, B.9.1

BEST ESTIMATE RESPONSE:

Initial Conditions - 100% power, all conditions normal, IC-15. With the Main Generator supplying the grid, a failure of the No. 1 Generator Transformer will result in a generator load reject and reactor scram.

DATA COLLECTION REQUIREMENTS:

Data/SPDS Format #	Description
	Plant Alarm Status
#701	Electrical Output
#702	Generator
#703	Electrical Bus Voltages
#000	Critical Plant Variables

REFERENCES: B.9.1

04A - Continued

ACCEPTANCE CRITERIA:

1. Upon malf. ED04A actuation, the following will occur:
   A. Reactor scram.
   B. 8N4 and 8N5 trip open.
   C. 286G actuated (Generator lockout).
   D. Generator field breaker trips and locks out.
   E. 286T actuated (Turbine lockout).
2. Plant responds normally to the Reactor scram.
3. All plant offsite power sources are energized and available; all plant 4160V busses remain powered.
4. Malfunction can be cleared.

Test Prepared By: John V. Shriver Date: 04/23/90

Test Conducted By: _____ Date: _____

Software Load: E T N

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Comments:

ED04 - LOSS OF MAIN (1AR,1R,24,2RS,1ARS) TRANSFORMER

CAUSE: Loss of selected transformer due to actuation of fault pressure relay, caused by sudden pressure increase.

REMOVAL OF MALFUNCTION

Will restore selected transformer pressure to normal, and allow transformer to be returned to service.

EFFECTS:

Loss of No. 1 Generator Transformer (ED04A)

If the main generator is synced to the grid when this malfunction is initiated, then the sudden pressure relay will actuate the generator lockout relay 286G. The 286G relay will cause the following actions to occur:

1) If the 345 KV disconnects are closed, lockout relays actuate to trip 8N4 and 8N5.

2) The generator field breaker trips and locks out.

3) The turbine trip relay 286T operates.

Loss of 1AR Transformer (ED04B)

A lockout on 1AR will cause relays to energize, which will trip and lockout 4160 V breakers 511 and 610 and energize the "1AR TROUBLE" and 1AR RES TRANS LOCKOUT" annunciators.

Loss of 1R Transformer (ED04C)

If 2R is not in service and 1R transformer locks out, then relays will energize to trip both Reactor Recirc MG sets. Transfer to 2R will not occur, so both Diesel Generators will start and all of the 4160 V supply breakers will open. This will cause 152-308 and 408 to open after a 5 second time delay, and 1AR to bus 15 and 16 breakers 152-511 and 610 to close.

Loss of 2R Transformer (ED04D)

A lockout on 2R transformer will cause an open ckt transfer to 1R, a trip and lockout of both Reactor Recirc MG Sets, and an automatic start of both Emergency Diesel Generators.

ED04 - LOSS OF MAIN (1AR,IR,24,2RS,1ARS) TRANSFORMER

EFFECTS: (Cont'd)

Loss of 2RS Transformer (ED04E)

A lockout on 2RS transformer will cause an open circuit transfer to 1R, a trip and lockout of both Reactor Recirc MG Sets, breakers 8N4 and 8N11 will trip open, and both Diesel Generators will start.

Loss of 1ARS Transformer (ED04F)

A lockout on 1ARS will cause breaker 8N4 to trip and lockout. In addition, if 1AR is being supplied from 1ARS, then 4160 V breakers 152-610 and -511 will trip if closed or be prevented from closing, if open.

INDICATIONS

Annunciators:

NO. 1 MAIN TRANS TROUBLE
NO. 1 GENERATOR LOCKOUT
1AR RES TRANS LOCKOUT
1AR TRANS TROUBLE
345 KV + 115 KV YARD TROUBLE
1R RES TRANS LOCKOUT
1R RES TRANS TROUBLE
2R XFMR LOCKOUT
2R XFMR TROUBLE

REF: Operations Manual B.9.1
NE-36399 shts. 1 through 9a

SELECTABLE:	YES
VARIABLE:	No
CLEARABLE:	YES

MONTICELLO SIMULATOR CERTIFICATION
APPENDIX #11

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR PROCEDURES MTCP NUMBER: 2.1

PURPOSE

The purpose of this procedure is to establish a controlled system for operation, maintenance, and modification of the Monticello Simulator and associated computer systems.

RESPONSIBILITIES

1. The Monticello Training Center General Superintendent of Training is responsible for approving the Monticello Simulator procedures.

2. Technical Support Training Supervisor shall establish policies and procedures to control the operations, maintenance, modification and NRC certification of the Monticello Simulator.

3. The Simulator Software Engineer is responsible for the review of plant modifications, design of the simulator change, implementation of the simulator change, and closeout of the paperwork associated with the change. This individual is also responsible for correcting modeling discrepancies and implementing Simulator improvements.

4. The I&C Specialist is responsible for implementing the hardware portion of a modification, improvement, or discrepancy report correction. Also, responsible for the operation and maintenance of the simulator computers. This individual may be assigned hardware design responsibilities associated with the simulator.

REQUIREMENTS

Procedures shall be established that control the following simulator related activities:

- Modifications
- Improvements
- Setpoint Changes
- Performance Testing
- Media Updating
- Maintenance/Operation
- Drawing Control
- Simulator Panel Physical Changes
- Discrepancies
- Records

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PRDCESSES

TITLE: MONTICELLO PLANT MODIFICATION REVIEW MTCP NUMBER: 2.2

PURPOSE

The purpose of this procedure is to ensure that Monticello Plant modifications are identified, reviewed, and incorporated into the Monticello Simulator. This procedure governs the method by which Monticello Plant modifications are identified and reviewed for their applicability to the simulator.

REQUIREMENTS

The Technical Support Training Supervisor shall ensure new modifications are added to a Modification Tracking System and modification completion date is added to the Tracking System for modifications completed since the last review.

1. The Technical Support Training Supervisor shall, for each modification, designate a member of the Simulator Staff to complete the Modification Review Form (MNTC #1560), Figure 2.2.1.

2. Prior to the SMRC meeting, the designated member of the Simulator Staff shall review each assigned modification for simulator applicability, make a recommendation, and state the basis for the recommendation. The Modification Design Description, for the plant modification package, should be attached to the Modification Review Form.

3. The Technical Support Training Supervisor shall call the meetings of the SMRC and be responsible for notifying the appropriate members. A minimum of four members should be present.

4. The Technical Support Training Supervisor shall designate a SMRC Secretary to be responsible for maintaining accurate minutes of each SMRC meeting.

5. The SMRC shall review each modification and decide whether or not a simulator change should be made or whether more research is done before a decision is made. These decisions and recommendations shall be documented on the Modification Review Form.

6. The Technical Support Training Supervisor shall assign any declared simulator modification a simulator modification number, as prescribed in the Simulator Number Procedure, MTCP 2.13. The Technical Support Training Supervisor shall assign a Simulator Software Engineer or Simulator I&C Specialist for modification completion.

7. The Simulator Software Engineer or Simulator I&C Specialist shall complete the simulator modification as prescribed in the Simulator Modification Procedure, MTCP 2.5.

8. If further investigation reveals that a modification assigned as a simulator change is not a simulator modification, the simulator modification should be canceled as prescribed in the Simulator Modification Cancellation Procedure, MTCP 2.6

MONTICELLO SIMULATOR CERTIFICATION
APPENDIX #11

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

PLANT MODIFICATION REVIEW FORM

PLANT MODIFICATION NUMBER: _____

TITLE: _____

ATTACH MODIFICATION DESCRIPTION

RECOMMENDATION BY: _____ DATE: _____

☐ NOT A SIMULATOR MODIFICATION ☐ SIMULATOR MODIFICATION

REASONS FOR APPLICABILITY OR NON-APPLICABILITY:

SMRC MEETING NO. _____

☐ RECOMMENDATION ACCEPTED ☐ RECOMMENDATION REJECTED

COMMENTS:

SIMULATOR MODIFICATION NUMBER: _____ ENGINEER/I&C SPECIALIST _____

Figure 2.2.1 (MNTC 1560)

TITLE: SIMULATOR IMPROVEMENT MTCP NUMBER: 2.3

PURPOSE

The purpose of this procedure is to ensure that all proposed simulator improvements are reviewed and incorporated in the Monticello Simulator, if beneficial and cost effective. This procedure governs the method by which proposed simulator improvements are reviewed to determine if they should be incorporated into the Simulator. Incorporation of simulator improvements is governed by the Modification Procedure.

INSTRUCTIONS

1. The initiator of each proposed simulator improvement shall provide, at the minimum, a detailed description and motive for the simulator improvement.

2. The Technical Support Training Supervisor or designee should complete an estimated expenditure for each proposed simulator improvement.

3. The Technical Support Training Supervisor or Simulator Staff shall review each proposed simulator improvement to determine if it should be incorporated into the simulator. The SMRC shall decide if the simulator suggestion will be a Simulator Modification.

4. The Technical Support Training Supervisor shall assign a Simulator Modification number to each simulator suggestion that is designated as a Simulator Modification.

5. The Simulator Software Engineer or Simulator I&C Specialist shall complete the Simulator Modification as prescribed in the Simulator Modification Procedure, MTCP 2.5.

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SIMULATOR CONFIGURATIONS CONTROL AND
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SIMULATOR IMPROVEMENT/SUGGESTION CHECKLIST

Simulator Modification No: _____

Simulator Engineer: _____

WRITTEN BY: _____ DATE: _____

DESCRIPTION OF IMPROVEMENT: (Attach drawings as necessary)

MOTIVE FOR IMPROVEMENT:

ESTIMATED EXPENDITURES:

A. Materials _____

B. Labor _____

REVIEWED BY: _____ DATE: _____

ACCEPTED REJECTED

REMARKS:

Figure 2.3.1 (MNTC-1555)

TITLE: SETPOINT CHANGE REVIEW PROCEDURE MTCP NUMBER: 2.4

PURPOSE

The purpose of this procedure is to ensure all Monticello Plant setpoint changes are reviewed and incorporated into the Monticello Simulator.

REQUIREMENTS

1. The Technical Support Training Supervisor shall ensure that each plant setpoint change is reviewed for applicability to the simulator and for applicability to the simulator database. Reviews should be performed on a quarterly basis.

2. A Setpoint Change Review Form shall be completed for all plant setpoint changes.

3. The Simulator staff member assigned to review the setpoint change shall complete the Review and Recommendation Section of the Setpoint Change Review Form MNTC 1562, Figure 2.4.1, with a recommendation of; Simulator Setpoint Change, not a Simulator Setpoint Change, and/or, Initial Conditions Update.

4. The Technical Support Training Supervisor shall review and approve the recommendation on the Setpoint Change Review Form.

5. The Technical Support Training Supervisor shall assign a simulator modification number as per the Simulator Change Numbering Procedure, MTCP 2.13, to all setpoint changes declared simulator modification and record this on the Setpoint Change Review Form. A copy of the Setpoint Change Review Form will be in the Simulator Setpoint Change File.

6. Any setpoint change declared a simulator modification shall be incorporated into the simulator by the Simulator Modification Procedure, MTCP 2.5.
A copy of the Setpoint Change Review Form should be attached to IT's respective Simulator Modification Package.

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SETPOINT CHANGE REVIEW FORM

Setpoint Change Review No. _____

Setpoint Characteristics

Inst No. _____ Unit/Sys. _____ Ref File _____

Setpoint Function:

Review and Recommendation

Reviewed By: _____ Date: _____

Recommendation: _____ Not a Simulator Change

_____ Simulator Change
_____ Initial Conditions Update (Attach IC Update Form)
_____ Simulator Data Base Update

Comments:

Simulator Modification Number _____ Engineer/I&C Specialist _____

Approved By: _____ Date: _____
Technical Support Training Supv.

Figure 2.4.1 (MNTC-1562)

TITLE: SIMULATOR MODIFICATION PROCEDURE MTCP NUMBER: 2.5

PURPOSE

The purpose of this procedure is to ensure the Monticello simulator will accurately reflect the appearance and performance of the Monticello Plant.

INSTRUCTIONS

1. Technical Support Training Supervisor shall assign individuals to complete each portion of the Simulator Modification package using the Simulator Assignment Form, MNTC-1583 (Figure 2.5.1). This form is not part of the complete modification package record.

2. The Simulator Software Engineer or Simulator I&C Specialist assigned shall use the following procedure for installation and documentation of all simulator modifications.

   a. Review the applicable Plant Modification, Proposed Simulator Improvement Checklist, or Setpoint Change Review Form to determine the scope of the simulator change.

   b. Review the simulator hardware, software, and documentation to determine what simulator changes are necessary. If a simulator change is not required, consult the Simulator Modification Cancellation Procedure. (MTCP 2.6)

   c. Use the Simulator Modification Installation Checklist, Form MNTC-1564 (Figure 2.5.2) to determine which items are probably applicable to the simulator modification.

   d. Complete the Simulator Modification Package Description Form MNTC-1551 (Figure 2.5.3).

   e. An estimate of all time and material costs to complete the simulator change may be added to the simulator change file.

   f. Complete the installation of any computer and control board hardware, Form MNTC-1552 (Figure 2.5.4).

   g. Complete any Software changes. Insure all in line software changes are traceable to the appropriate simulator modification number Form 1553 (Figure 2.5.5).

   h. Complete hardware testing to ensure any hardware is properly installed.

   i. Forward the package to the Technical Support Training Supervisor to ensure a Performance Test is conducted to test the effects of the change on the affected systems and components. This shall be completed in accordance with MTCP 2.7.

   j. Ensure any applicable simulator data base is updated and complete Form MNTC-

1554 (Figure 2.5.6). This includes, but is not limited to:

- Drawings, Procedures, and Specifications

- Final Design Specification.

  - System Design Data
  - System Malfunctions
  - System Remote Function
  - System Overrides
  - Variable Setpoints
  - Design Assumptions
  - Design Simplifications
  - System Panel Instrumentation
  - Process Computer Monitored Parameters
  - Component Information Tables
  - Simulation System Description
  - Simulation System Diagrams
  - Software Interface Diagrams
  - System Coding and Comments
  - System Instrumentation Setpoints
  - PCM Monitored Parameters
  - Design References
  - Component Type Simulation Modules
  - Instrumentation Type Simulation Modules

- Operations Manual

- Operations and Maintenance Manual

- I/O List

- Simulator Hardware Drawings

- Panel Photographs

- Wire List

- Programmer's Guide

- Ensure the instructor station is modified if necessary.

- If IC's require updating, complete the Initial Condition Update Form.

k. Place a copy in the Simulator Modification Package and forward the IC Update Form to the Technical Support Training Supervisor.

l. Ensure adequate documentation is placed in the Simulator Modification Package. The modification package shall identify which software was modified by program name, subroutine number, equation number, etc. and shall be traceable.

m. Complete the top portion of the Simulator Modification Completion/Cancellation Form, MNTC-1550 (Figure 2.5.7) (Cover page for Modification package). Return the completed simulator modification package to the Technical Support Training Supervisor.

n. The Technical Support Training Supervisor shall assign an individual to review the package for completion accuracy and adequacy of documentation. The reviewer shall then return the package to the Technical Support Training Supervisor.

o. The Technical Support Training Supervisor shall review the Installation Checklist and the Simulator Modification Package to ensure that the appropriate actions were taken and that the file is complete. If the file is complete, the Technical Support Training Supervisor shall approve the change installation.

3. All revised drawings shall be complete in accordance with MTCP 2.17 prior to simulator change completion.

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SIMULATOR MODIFICATION ASSIGNMENT FORM

Simulator Modification Number: _____

Mod Description (Systems affected):

Task	Assigned Individual	Date Due	Initials/Date Complete
Software Installation Reviewer			
Hardware Installation Reviewer			
Update C & E Reviewer			
PCM Update Reviewer			
Write Mod Test Reviewer			
Review Cert Tests			
Perform Mod Test			
Mod Package Review			
Mod Closed out and logged			

Figure 2.5.1 (MNTC-1583)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR CHANGE INSTALLATION CHECKLIST

SIMULATOR CHANGE NUMBER _____

THE SIMULATOR CHANGE ENGINEER OR SIMULATOR HARDWARE SPECIALIST SHOULD COMPLETE THE FOLLOWING FOR APPLICABILITY TO THIS SIMULATOR CHANGE.

	NOT APPLICABLE	APPLICABLE	DATE
A. Simulator Data Base			
1. Final Design Specification Updated	☐	☐	
2. Operations and Maintenance Manual Updated	☐	☐	
3. Input/Output List Updated	☐	☐	
4. Simulator Hardware Drawings Updated	☐	☐	
5. Simulator Wire List Update	☐	☐	
6. Simulator Programmers Guide Update	☐	☐	
7. Simulator Database Computer Files Updated	☐	☐	
8. Simulator Drawing	☐	☐	
9. Control Panel Photographs	☐	☐	
B. Instructor Station			
1. Daily Operational Readiness Test Updated	☐	☐	
2. Instructor Station Tableaus Updated	☐	☐	
3. Instructors Documentation Updated	☐	☐	
a. Malfunction Cause and Effects	☐	☐	
b. Initial Conditions Changed/Re-shot	☐	☐	
c. Initial Conditions Override List	☐	☐	
C. Simulator Hardware			
1. Control Board Hardware Modified/Added	☐	☐	
2. Control Board Labeling Modified/Added	☐	☐	
3. Annunciator and Status Light Windows Modified/Added	☐	☐	
4. Computer Hardware Modified/Added	☐	☐	
D. Testing/Miscellaneous			
1. Test Procedure Written	☐	☐	
2. Cost Estimate Completed	☐	☐	
3. Testing Completed	☐	☐	
4. Future Concerns	☐	☐	

Figure 2.5.2 (MNTC-1564)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR MODIFICATION PACKAGE DESCRIPTION SHEET

SIMULATOR MODIFICATION NO: _____

(1) - Reason for Simulator Modification:

(2) - System(s) Affected:

(3) - Description of Simulator Modification:

_____ Date: _____
Software Engineer/I&C Technician

Figure 2.5.3 (MNTC-1551)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR MODIFICATION PACKAGE HARDWARE SHEET

SIMULATOR MODIFICATION NO: _____

A. Hardware to be removed from Simulator:

B. Hardware to be added to Simulator:

C. Modification to existing hardware:

P.O. numbers and other useful information:

E. All hardware changes completed and correct:

_____ Date: _____
I&C Specialist

Figure 2.5.4 (MNTC-1552)

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SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR MODIFICATION PACKAGE SOFTWARE SHEET

SIMULATOR CHANGE NO: _____

A. Simulator software which was deleted (Include name of source code and equation number):

B. Simulation software which was added (Include name of source code and equation numbers):

Simulation software which was modified (Include name of source code and equation numbers):

D. All software changes completed and correct:

_____ Date: _____
Software Engineer

Figure 2.5.5 (MNTC-1553)

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SIMULATOR MODIFICATION PACKAGE DOCUMENTATION SHEET

SIMULATOR MODIFICATION NO: _____

(1) - List of documentation stored on computer which needs to be updated:

(2) - List of documentation (excluding Data Base) which needs to be updated:

(3) - List of items in Simulator Data Base which need to be updated:

(4) - All document updates have been completed for this Simulator Modification:

_____ Date: _____
Software Engineer/I&C Technician

Figure 2.5.6 (MNTC-1554)

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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR MODIFICATION COMPLETION/CANCELLATION FORM

SIMULATOR MODIFICATION NO: _____

DESCRIPTION OF SIMULATOR MODIFICATION/CANCELLATION:

(Attach additional pages as necessary)

(MULATOR MODIFICATION INSTALLATION CLOSEOUT

Completed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____
Technical Support Training Supervisor

SIMULATOR MODIFICATION CANCELLATION

Canceled By: _____ Date: _____

Cancellation Approved By: _____ Date: _____
Technical Support Training
Supervisor

Figure 2.5.7 (MNTC-1550)

TITLE: SIMULATOR MODIFICATION CANCELLATION PROCEDURE MTCP NUMBER: 2.6

PURPOSE

The purpose of this procedure is to establish a process for cancellation of a simulator modification after a simulator modification number has been assigned.

INSTRUCTIONS

1. After identifying a simulator modification which may require cancellation, the Simulator Software Engineer or Simulator I&C Specialist shall describe the reasons for cancellation of the Simulator Modification Completion/Cancellation Form MNTC-1550 (MTCP 2.5, Figure 2.5.7).

2. The SMRC shall be polled for comments on the determination that a cancellation is warranted of a simulator modification. This is accomplished with a letter to SMRC members in accordance with MTCP 2.8, and results shall be attached to Form MNTC-1550.

3. The Simulator Modification Package shall be sent to the Technical Support Training Supervisor for final cancellation approval.

4. The Technical Support Training Supervisor and SMRC shall make an evaluation of the simulator modification to determine if it should be canceled. Typically, a simulator modification should only be canceled if:

   a. A simulator modification number has been assigned to a modification that does not affect the appearance, function, or operation of the simulator.

   b. The plant modification is canceled.

   c. An appropriate engineering, or training evaluation indicates the modification is not required.

5. If the Simulator Modification is not canceled, the simulator modification shall be completed by the Simulator Software Engineer or Simulator I&C Specialist in accordance with MTCP 2.5.

6. If the simulator modification is to be canceled, the Technical Support Training Supervisor shall approve the cancellation and update the Simulator Modification Index.

7. If the simulator modification was the result of a Simulator Suggestion the Technical Support Training Supervisor shall provide the initiator of the change request the reason for cancellation.

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR MODIFICATION TESTING AND REVIEW MTCP NUMBER: 2.7

PURPOSE

The purpose of this procedure is to ensure that all simulator changes are correctly installed, adequately tested and reviewed. This procedure governs the method by which any simulator modification is tested and reviewed in order to verify that the simulator modification is correctly installed and documented.

INSTRUCTIONS

1. The Technical Support Training Supervisor shall assign individuals to write review and perform the Simulator Modification Test.

2. The person assigned to write the Simulator Modification Test shall review the Modification package and the NRC Certification Test files prior to writing the modification test. Figure 2.7.1 shall be used a guide for the test format.

3. The person assigned to review the Simulator Modification Test shall review the Modification package, the NRC Certification Test files, and the Modification Test to ensure the Simulator is properly tested.

4. The person assigned to perform the Simulator Modification Test shall conduct the Simulator Modification Test and record the results. Upon completion, the Simulator Modification Test shall be returned to the Technical Support Training Supervisor.

5. The Technical Support Training Supervisor shall assign an individual to be the Simulator Modification Reviewer.

6. The Simulator Modification Reviewer shall review the simulator modification package using the Simulator Modification Installation Checklist as a guide. The Simulator Modification Reviewer shall ensure:

   a. All applicable items are updated, installed, and documented.

   b. Adequate documentation is in the simulator modification packages.

   c. If applicable, the Simulator Modification Test has been completed by a qualified person (should be SRO or RO licensed or SRO certified for non-hardware changes.)

7. The Simulator Modification Reviewer shall complete the appropriate section of the Simulator Modification Completion/ Cancellation Form and return the Simulator Modification Packages to the Technical Support Training Supervisor.

8. The Technical Support Training Supervisor shall closeout the simulator change and complete the Simulator Modification Completion/Cancellation Form.

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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR MODIFICATION TEST

(Format and guide)

SIMULATOR MODIFICATION NUMBER_____

MODIFICATION TITLE_____

REFERENCE: (Plant Mod #, Operations Manuals, Drawings, etc.)

Prepared By: _____ Date_____

Reviewed By: _____ Date_____

Performed By:_____ Date_____

NRC Certification tests required: (List test to be performed.)

Test Set up: (Conditions of the simulator.)

(s): (May be included in Test Steps.)

Load: (Load that contains the Mod.)

Test step: (Step by steps procedure for testing all situations applicable to this Modification.)

1.

2.

3.

Results: (Pass, fail, DR's written, other considerations.)

Figure 2.7.1

TITLE: SIMULATOR MODIFICATION REVIEW COMMITTEE (SMRC) MTCP NUMBER: 2.8

PURPOSE

To establish the SIMULATOR MODIFICATION REVIEW COMMITTEE (SMRC) and its responsibilities at Monticello Training Center.

REQUIREMENTS

1. All Monticello Plant Modifications and Simulator Suggestions shall be reviewed by the SMRC.

   a. A Simulator Change Form shall be filled out for each plant modification and simulator suggestion reviewed.

   b. Criteria for determining a Simulator Modification is required and feasible:

      - Training needs
      - Regulatory Requirement
      - Simulator function, appearance and operation
      - Cost/Benefit

2. The Technical Support Training Supervisor shall assign a Simulator Modification Number if the SMRC determines that the change fits the criteria for a Simulator Modification.

   a. If a change is in question, an individual shall be assigned to investigate the modification applicability to the simulator and report to the SMRC by the assigned due date.

   b. After the investigation, if it is determined that the change fits the criteria for a simulator modification, the Technical Support Training Supervisor shall assign a Modification Number without calling a SMRC meeting by polling members to accept it as a simulator modification using Form MNTC-1583 (Figure 2.8.1).

   c. If a change is still in question, it will be referred to the General Superintendent of Training for final deposition.

3. A modification that has been accepted as a Simulator Modification may be canceled by polling the committee in accordance with MTCP 2.6.

4. The SMRC shall be composed of at least:

   Technical Support Training Supervisor - Chairperson
   Operations Instructor Supervisor
   One Simulator Hardware Specialist
   One Simulator Software Engineer
   Simulator Operation Instructor (Simulator Group)

5. SMRC shall meet at least quarterly. The date of the next quarterly meeting shall be scheduled at the current quarterly meeting.

6. Other meetings may be scheduled as needed or requested by other SMRC members.

7. The SMRC shall have a standing agenda as follows:

   Previous meeting minutes
   Status report on simulator modifications
   Status report on high priority D.R.'s (old)
   Status report on modifications "Under Investigation"
   Review of new plant modifications
   Review simulator suggestions
   Review of new D.R.'s priority
   Other business/concerns

8. SMRC meeting minutes shall be recorded by the appointed secretary and distributed to the members, attendees, the General Superintendent of Training and the General Superintendent of Operations.

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SIMULATOR MODIFICATION REVIEW COMMITTEE (SMRC) POLLING FORM

Requestor: _____ Date: _____

Description of requested feedback:

Simulator Modification Number (if applicable):

SMRC Members: Date Due: _____

Simulator Support Supervisor
Operations Training Supervisor
Senior Operations Instructor
Simulator Group Sr. Production Engineers
Simulator Group Sr. Instrument and Control Specialists

Comments:

Signature: _____ Date: _____

Attachments:

Figure 2.8.1 (MNTC-1582)

TITLE: SIMULATOR PERFORMANCE TESTING MTCP NUMBER: 2.9

PURPOSE

The purpose of this procedure is to ensure that all Simulator Performance Testing required by Section 5.4 of ANS 3.5 1985, Simulator Performance Testing, is conducted. This procedure establishes the minimum criteria for the performance of Monticello Simulator.

REQUIREMENTS

1. Simulator Performance Testing shall be conducted for each of the following:

   a. Initial construction and acceptance for training. This testing is assumed to have been completed during the Factory Acceptance Testing.

   b. When the simulator is modified, the testing is discussed in the MTCP 2.5. When a limited change is made, a specific performance test on the affected systems and components shall be performed.

   c. Simulator Performance Testing shall meet the requirements specified in Title 10 CFR, Part 55.45 and Regulatory Guide 1.149 Rev.1 and ANSI/ANS 3.5 - 1985.

2. Test format should meet structure requirement of Figure 2.9.1.

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(Type of Test) TEST REPORT

Title: _____ Test Number: _____ Test Rev. ____

System: _____

Test Result Acceptable: Yes _____ No _____ DRs written:

Unacceptable Response: _____

Basis for best estimate result: _____

Initial Conditions: _____

Best Estimate Response: _____
(Test Steps)

Data Collection Requirements:

References:

Acceptance Criteria:

Test Prepared By: _____ Date: _____

Test Conducted By: _____ Date: _____

Software Load: E T N

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____

Comments:

Figure 2.9.I

TITLE: SIMULATOR INITIAL CONDITIONS UPDATE MTCP NUMBER: 2.10

PURPOSE

The purpose of this procedure is to ensure the proper initial conditions (IC's) are incorporated in the Monticello Simulator. This procedure governs the method by which Initial Conditions (ICs) are updated for the simulator and applies only to Protected Initial Condition updates. This procedure does not govern IC's used for license Requalification Exams, Emergency Plan Exercises or software development.

INSTRUCTIONS

1. The following steps should be followed for incorporation of initial condition updates:

   a. Initial condition updates may originate from any member of the MTC staff. The need for an initial conditions update may have been identified during normal instruction, Setpoint Change Review, or Simulator Modification Installation.

   b. The individual who has identified the need for an initial condition update should fill out an Initial Conditions Update Request Form, MNTC-1565 (Figure 2.10.1) Section I. If the update is the result of a simulator change, the simulator change number should be indicated in the "Reason for Change" section.

   c. If the initial condition update is the result of a Simulator Modification or Discrepancy Report, it should be noted in the associated change documentation.

   d. Forward the Initial Conditions Update Request Form to the Technical Support Training Supervisor for approval and assignment of individual to update IC's.

   e. The responsible individual will collect the Initial Conditions Update Forms and hold until initial conditions are re-shot.

   f. A copy of the Initial Conditions Update Request Form shall be filed in the records system and a copy shall be posted at the Instructor Station.

   g. The Simulator I&C snapshot checklist (Figure 2.10.2) should be used for shooting and re-shooting IC's.

   h. When initial conditions are re-shot the last portion of the Initial Conditions Update Request Form shall be completed and forwarded to the Technical Support Training Supervisor with the Initial Conditions Summary Sheet, MNTC-I577, Figure 2.I0.3.

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SIMULATOR DESIGN UPDATE PROCESSES

INITIAL CONDITIONS UPDATE REQUEST FORM

SECTION I

Requested By: _____ Date: _____

Description of Change:

Reason for Change:

APPLICABLE ICs

SECTION II

Completed By: _____ Date: _____

Approved By: _____ Date: _____

Closed Out: _____ Date: _____

Figure 2.10.1 (MNTC-1565)

SIMULATOR SNAPSHOT CHECKLIST

_____1. Check the instructors station for the following: Annunciator silence, fast time, slow time, recorder power off, and freeze.

_____2. Are appropriate annunciator windows flashing (front or back panels).

_____3. Are the solid annunciator windows normally on for the conditions established (front and back panels).

_____4. Desired rod selected.

_____5. Are power and flow within Tech Spec limits.

_____6. Check Rx level, power, and pressure. Are they constant.

_____7. The following switches should be checked for correct sets for the conditions established?

A. C-3I Recirc pump trip interlock bypass switches;

B. C-259 Ox. and Hy. concentration selector switch and range switches;

C. C-13 Nitrogen purge to TIP's;

D. C-252A Off-gas storage tank switches and bypass valve switch;

E. C-02 Stack isolation reset switch;

F. C-08 Aux. power lineup;

G. C-06 Torus air isolation switch; and

H. C-05 APRM, RBM, IRM, and SRM bypass switches.

_____8. Check malfunction page.

_____9. Check any self-triggered malfunctions armed.

____10. Check instructor overrides in effect.

____11. Check all pages of remote functions for proper valve/electrical lineups.

____12. Has IC been checked for stability either before, after, or both.

____13. Update IC menu.

____14. After the snap-shot: enter any remarks, the date, and fill out IC summary sheet.

Figure 2.10.2

MONTICELLO SIMULATOR CERTIFICATION
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SIMULATOR DESIGN UPDATE PROCESSES

INITIAL CONDITIONS SUMMARY SHEET

REACTOR PARAMETERS

Reactor Power _____ MWTH

Reactor Press _____ psig

Reactor temp _____ F

Core Flow _____ lbm/hr

Mode Switch SD RF SU RN

Rod/Step/Pos ____/____/____

Core Life BOC MOC EOC

ELECTRICAL CONDITIONS

4160V Feed 1R _____ 2R _____

1AR Feed 10 _____ 1ARS_____

DG 11 _____ 12 _____ 13 _____

PLANT EQUIPMENT STATUS

Generator Output _____ MWe

Press Control PRO _____ EPR _____ MPR _____

Feed Pumps 11 _____ 12 _____

Condensate pumps 11 _____ 12 _____

CRDH Pumps 11 _____ 12 _____

SW Pumps 11 _____ 12 _____ 13 _____

RBCCW pumps 11 _____ 12 _____

RWCU pumps 11 _____ 12 _____

Recombiners A _____ B _____

CONTAINMENT

Drywell Inerted Yes _____ No _____

Drywell Fans

V-RF-1	op	stby
V-RF-2	op	stby
V-RF-3	op	stby
V-RF-4	op	stby

SPECIFIC PLANT CONDITIONS

_____

_____

_____

_____

_____

_____ _____ _____ _____

APPROVED BY DATE IC SHOOT DATE

Figure 2.10.3 (MNTC-1577)

TITLE: DISCREPANCY REPORT MTCP NUMBER: 2.11

PURPOSE

The purpose of this Procedure is to ensure that all Monticello Simulator Discrepancy Reports are reviewed and changes are incorporated into the Monticello Simulator.

INSTRUCTIONS

1. Monticello Discrepancy Reports shall be initiated for, but not limited to:

   a. Hardware failures and repair including the instructor's station, computer and computer peripheral systems.

   b. Instrument adjustments, calibrations, etc.

   c. Incorrect simulation drawings and documentation.

   d. Inaccurate system operations and responses.

2. The Discrepancy Report Initiator shall complete a draft Discrepancy Report Form to include:

   a. Initiator name and date

   b. State of the Simulator when the discrepancy occurs.

   c. A temporary snapshot for appropriate situations.

   d. A precise and clear description of the discrepancy which includes but is not limited to:

      - Instrument and unit numbers if applicable.
      - Malfunctions or remotes active during the discrepancy and if malfunctions were activated by the remote control.
      - Incorrect and correct operation and responses.
      - Specific references including:
        - Flows, logics, schematics or other drawings
        - Operations and Technical Manual sections
        - Personal conversations and experience
        - Plant modifications or setpoint changes
        - Photographs

3. The Technical Support Training Supervisor or his designee shall review all Simulator Discrepancy Reports to ensure they are complete, self-explanatory, and valid discrepancies. Any incomplete or vague Discrepancy Reports may be returned to the initiator for further information. The SMRC may be consulted to assist the Technical Support Training Supervisor or designee.

4. The Technical Support Training Supervisor or his designee shall have the draft DR typed and assign a Simulator DR number and priority to all valid Discrepancy Reports. The goldenrod copy shall be placed in the DR status book at the Instructors Station.

5. The Technical Support Training Supervisor shall assign an individual to correct the discrepancy, log the DR on the simulator change tracking log and forward to the assigned individual.

6. For all Discrepancy Reports, the following shall be completed:

   a. The assigned individual shall correct the discrepancy, describe the corrective action in the appropriate section of the DR Form and keep the pink copy for their file. Forward the white and yellow copies to the Technical Support Training Supervisor.

   b. After completion of the corrective action, the Technical Support Training Supervisor shall assign an individual to check the corrective action.

   c. The assigned individual shall assure the discrepancy has been corrected by observing/testing the simulator performance for correct response using MNTC-1561, Figure 1.11.2 and then either:

      Complete the "Accepted By" section of the Discrepancy Report Form when the discrepancy has been corrected satisfactorily, replacing the goldenrod copy with the signed yellow copy, forward DR (white copy) to Technical Support Training Supervisor.

      OR

      Complete the "Rejected By" section when the corrective action is unsatisfactory with the reason for rejection and forward both the white and yellow copies to the Technical Support Training Supervisor.

7. The Technical Support Training Supervisor shall log the results of the recheck and either reassign an individual to correct rejected DRs steps 5.5 and 5.6 above, or file closed out accepted DR's (white copy).

NSP - Monticello Simulator Discrepency Report	DR #
Written By:	Date:
State of Plant: Load:	Temporary IC#
Description of Discrepancy:	
Expected Results:	
Data/Spec. References:	
Correction Action: Load:	Priority: Doc. Change? System: Engineer: Man-hours: Date Corrected:
Rejected By: Date: Reason:	
Accepted By: Date:	

MONTICELLO SIMULATOR CERTIFICATION
APPENDIX #11

SIMULATOR CONFIGURATIONS CONTROL AND
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DR CLOSEOUT CHECKLIST

When retest of a DR is complete and prior to closeout, ensure the following is considered:

Yes	No	
☐	☐	Is a Certification Test Update Required?
☐	☐	Do protected IC's need reshooting?
☐	☐	Do Malfunction Cause and Effect(s) Description(s) need updating?
☐	☐	Do any Malfunction Tests need updating?
☐	☐	Does this affect remote functions?
☐	☐	Does this affect Simulator Operating Limits?
☐	☐	Does this affect Annual Operability Testing?
☐	☐	Does this affect Normal Operations or Surveillance Test?
☐	☐	Does this affect any Instructor Station Tests?
☐	☐	Does this affect Physical Fidelity?
☐	☐	Could this affect Real Time Simulator Performance?

Attach this checklist to the DR Package.

Checklist Completed by _____

Figure 2.I1.2 (MNTC-1561)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR CHANGE NUMBERING SYSTEM MTCP NUMBER: 2.13

PURPOSE

The purpose of this procedure is to establish a numbering system to identify modifications, discrepancy reports, setpoint changes and physical control board changes to the Monticello Simulator.

PROCESS

1. All changes to the Monticello Simulator shall be assigned a simulator change number, when it is determined to be applicable.

2. The format of this number shall be as follows:

AAYY-NN

"AA" indicates the type of change, where "AA =:

- **DR** for a Simulator Discrepancy Report.
- **MI** for a Simulator Improvement/Suggestion while the package is open (then changed to MS).
- **MS** for a Simulator Modification which was identified by a plant modification.
- **MP** for a Simulator Modification which was identified by a plant modification but is pending approval by the plant.
- **SS** for a Setpoint Change.
- **LC** for a Physical Control Board Change that was completed in the plant outside the plant modification process.
- **CC** for Simulator Computer Configuration changes.
- **DD** for Drawing Revisions.

AND YY = The year the change was determined to apply to the simulator.

AND NNN = A sequential number for that year.

3. All simulator changes will be logged and tracked according to the simulator change number by the Technical Support Training Supervisor.

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR PHYSICAL CHANGE CONTROL BOARDS MTCP NUMBER: 2.14

PURPOSE

The purpose of this procedure is to establish a process to control the installation, documentation and records for physical change to the simulator control boards.

INSTRUCTIONS

1. When notification of a change to the Monticello Plant Control room is made and is not a plant modification, the Technical Support Training Supervisor shall review the change for applicability to the simulator.

2. Assign a simulator change number if the simulator is affected.

3. Assign a Simulator I&C Specialist to install the changes.

4. The Simulator I&C Specialist shall install the change, complete the Simulator Control Board Physical Change form MNTC-1584 (Figure 2.14.1) and insure that all applicable drawings and documentation is updated.

5. Send the package to the Technical Support Training Supervisor who will assign a reviewer.

6. The reviewer shall review the package for proper installation and all appropriate documentation updates.

7. The reviewer will than forward the package to the Technical Support Training Supervisor for closeout.

8. The Technical Support Training Supervisor shall review and closeout the package.

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SIMULATOR CONFIGURATIONS CONTROL AND
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SIMULATOR CONTROL BOARD PHYSICAL CHANGE FORM

Simulator Control Board Physical Change Number: _____

I&C Specialist: _____

Description of Change:

Drawings/Documents Updated:

Attachments:

Completed By: _____ Date: _____

Reviewed By: _____ Date: _____

Comments:

Closed Out: _____ Date: _____

Figure 2.14.1 (MNTC-1584)

TITLE: MEDIA UPDATE MTCP NUMBER: 2.15

PURPOSE

The purpose of this procedure is to control the process of updating, maintaining and protecting simulation software ensuring proper configuration controls on all the software associated with the Monticello Simulator.

REQUIREMENTS

1. Media updates shall be made at least once every six weeks.

2. Disc backup shall be made at least once every quarter.

3. Software Engineers should do a daily tape save of their software changes made during each day.

4. The current Tape Save shall be stored in the Monticello Records vault to satisfy disaster storage requirements.

5. Labeling of tapes shall include title of software, load(s), name of computer, date of save, and name of individual performing the save.

6. The individual assigned to perform the media updates shall fill out the Media Update Form MNTC-1585 (Figure 2.15.1) and forward to the Technical Support Training Supervisor.

7. The Technical Support Training Supervisor shall approve the media update form and forward it to the records file.

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SIMULATOR MEDIA UPDATE FORM

Assigned Individual: _____ Date: _____

Type of Media Update: _____ Tape Save _____ Disc Backup

Number of tapes/volumes used:

Problem encountered:

Tapes stored in MNGP Vault: _____ Date: _____

Signature: _____ Date: _____

Approved: _____ Date: _____

Figure 2.15.1 (MNTC-1585)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR COMPUTER CONFIGURATION CONTROL PURPOSE MTCP NUMBER: 2.16

PURPOSE

The purpose of this procedure is to establish a process to control the configuration of the simulator computers including computer hardware, computer operating systems and utility programs not used as part of the simulation load.

INSTRUCTIONS

1. The Technical Support Training Supervisor shall review, approve Configuration Changes Form MNTC-1593 (Figure 2.16.1) and assign a change number for all Simulator Computer Configuration Change Packages.

2. The Technical Support Training Supervisor shall assign individuals to complete each portion of the Simulator Configuration Change Package using the assignment portion of Form MNTC-1588 (Figure 2.16.2).

3. The assigned individual shall prepare the installation plan Form 1592 (Figure 2.16.3) and forward to the reviewer.

4. The assigned reviewer shall review the installation plan and sign off on the MNTC-1588.

5. The assigned individuals shall install hardware and/or software described in the Installation Plan and document the changes on Forms MNTC-1589/1590 (Figures 2.16.4 and 2.16.5).

6. The assigned individual shall prepare the installation Test(s) using Figure 2.16.6 as a guide for format.

7. The assigned reviewer shall review and sign the installation test(s) and MNTC-1588.

8. The assigned performer shall conduct the configuration change test and MNTC-1588.

9. The assigned individual(s) shall record all documentation updates on Form 1591 (Figure 2.16.7).

10. The assigned individual shall review the completed package, sign, date and forward the package to the Technical Support Training Supervisor for close out.

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SIMULATOR CONFIGURATION CHANGE FORM

Simulator Configuration Change Number: _____

Configuration Change Description:

Reason for Change:

Approval of Change: _____ Date: _____
Technical Support Training Supervisor

Simulator Configuration Change Complete:

Completed By: _____ Date: _____

Reviewed By: _____ Date: _____

Approved By: _____ Date: _____
Technical Support Training Supervisor

Figure 2.16.1 (MNTC-1593)

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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR ASSIGNMENT AND PACKAGE CHECKLIST

FOR

CONFIGURATION CHANGE

Simulator Configuration Change Number: _____

TASK	ASSIGNED INDIVIDUAL	DATE DUE	SIGNATURE	DATE COMPLETE
Installation Plan Reviewer	_____	_____	_____	_____
	_____	_____	_____	_____
Software Installation Reviewer	_____	_____	_____	_____
	_____	_____	_____	_____
Hardware Installation Reviewer	_____	_____	_____	_____
	_____	_____	_____	_____
Documentation Update Reviewer	_____	_____	_____	_____
	_____	_____	_____	_____
Hardware Test Reviewer	_____	_____	_____	_____
Performer	_____	_____	_____	_____
	_____	_____	_____	_____
Software Test Reviewer	_____	_____	_____	_____
Performer	_____	_____	_____	_____
	_____	_____	_____	_____
Performance Test Reviewer	_____	_____	_____	_____
Performer	_____	_____	_____	_____
	_____	_____	_____	_____
Package Reviewer	_____	_____	_____	_____

Figure 2.16.2 (MNTC-1588)

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SIMULATOR CONFIGURATIONS CONTROL AND
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SIMULATOR CONFIGURATION CHANGE

INSTALLATION PLAN

Simulator Configuration Change Number: _____

Prerequisites:

Installation Steps:

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SIMULATOR DESIGN UPDATE PROCESSES

Figure 2.16.3 (MNTC-1592)

SIMULATOR CONFIGURATION HARDWARE CHANGE FORM

Simulator Configuration Change Number: _____

A. Description of Hardware added:

B. Description of Hardware removed:

C. Description of Hardware modified:

Completed By: _____ Date: _____
I&C Specialist

Reviewed By: _____ Date: _____

Figure 2.16.4 (MNTC-1589)

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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR CONFIGURATION SOFTWARE CHANGE FORM

Simulator Configuration Change Number: _____

A. Description of Software added:

B. Description of Software removed:

C. Description of Software modified:

Completed By: _____ Date: _____
Software Engineer

Reviewed By: _____ Date: _____

Figure 2.16.5 (MNTC-1590)

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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR CONFIGURATION CHANGE TEST FORMAT

(GUIDE)

Simulator Configuration Change Number: _____

Prepared By: _____ Date: _____

Prepared By: _____ Date: _____

Prepared By: _____ Date: _____

TYPE OF TEST: _____ Hardware _____ Software _____ Performance

Prerequisites:

Test Steps:

Acceptance Criteria:

Figure 2.16.6

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

SIMULATOR CONFIGURATION DOCUMENTATION CHANGE FORM

Simulator Configuration Change Number: _____

A. Description of Documentation added:

B. Description of Documentation removed:

C. Description of Documentation modified:

Completed By: _____ Date: _____
I&C Specialist

Completed By: _____ Date: _____
Software Engineer

Reviewed By: _____ Date: _____

Figure 2.16.7 (MNTC-1591)

TITLE: SIMULATION DRAWING CONTROL MTCP NUMBER: 2.17

PURPOSE

The purpose of this procedure is to establish a process for updating and controlling simulation drawings.

INSTRUCTIONS

1. When the simulator is changed, the responsible person shall review and markup the applicable simulation drawings. Fill out the Simulation Drawing Revision Request Form, MNTC-1586, Figure 2.17.1.

2. Marked up drawings are forwarded to the drafter for revision.

3. Drafter shall make revision IAW marked up drawings and send them to the responsible person for verification of check prints.

4. After the requestor has verified the check prints, return them to the drafter.

5. The drafter shall make copies of the revised drawings and update the drawing manuals and indexes in accordance with the distribution lists. He shall complete the simulation drawing revision form and send it to the responsible person for incorporation into the appropriate simulator change package.

MONTICELLO SIMULATOR CERTIFICATION
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SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

MONTICELLO SIMULATOR
SIMULATION DRAWING REVISION FORM

Requestor: _____ Date: _____

New Drawing: _____

Reason for change:

Affected Drawings #	Rev.	Check Prints/Date	Final Closeout/Date

Requestor closeout: _____ Date: _____

Figure 2.17.1 (MNTC-1586)

TITLE: SIMULATOR HARDWARE RECEIPT MTCP NUMBER: 2.18

PURPOSE

The purpose of this procedure is to control and document receipt inspection of newly purchased or repaired simulator equipment. This procedure excludes consumable and component level items.

REQUIREMENTS

1. Simulator I&C Specialist shall fill out Receipt Inspection Form, MNTC-1587, Section I (Figure 2.18.1) for all items to be receipt inspected.

2. The Receipt Inspection Test shall include either operational test, Functional Test, or Bench Test.

3. Perform Receipt Inspection Test and record the results and sign and date the bottom of Section I.

4. Forward to Technical Support Training Supervisor for review and Close out, Section II, Figure 2.18.1.

MONTICELLO SIMULATOR CERTIFICATION
APPENDIX #11

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

RECEIPT INSPECTION FORM

Section I

Date Received: _____

PO #: _____

Simulator Change Number: _____

Description of Equipment:

ceipt Inspection Test:

_____

Result:

Signature: _____ Date: _____

Section II

Closed
Out Review: _____ Date: _____

Figure 2.18.1 (MNTC-1587)

SIMULATOR CONFIGURATIONS CONTROL AND
SIMULATOR DESIGN UPDATE PROCESSES

TITLE: SIMULATOR RECORD MTCP NUMBER: 2.19

PURPOSE

The purpose of this procedure is to identify required simulator records.

REQUIREMENTS

1. All required Simulator Records shall be maintained in accordance with the Monticello Training Center Records Management System.

2. The following is a list of required Simulator Records:

   a. Simulator Procedures

   b. Monticello Plant Modification Reviews

   c. SMRC Meeting Minutes with Attachments

   d. Simulator Modification Packages

   e. Completed Simulator Discrepancy Reports

   f. Setpoint Change Reviews

   g. Simulator Performance Tests

   h. Initial Conditions Updates and Summaries

   i. Simulator Control Board Physical Change Packages

   j. Simulator Computer Configuration Change Packages

   k. Simulation Drawing Revisions

   l. Simulator Receipt Inspections

   m. Simulator Media Updates

   n. Simulator Malfunction Cause and Effects

   o. Simulator Operations and Maintenance Manuals

   p. simulator Monthly Status Reports

   q. Simulator Certification Report

   r. Simulator Annual Certification Test Reports

   s. Simulator Design Data Base

CERTIFICATION REVIEW GROUP

Appendix #12

The Certification Review Group consists of the Simulator Support Supervisor, one member of the Plant Shift Supervisor Crew, the Operations Training Supervisor, the Senior Operations Instructor responsible for simulator maintenance/testing and a Simulator Group Instrument and Control Technician. The responsibilities of the Certification Review Group are to review and approve certification test procedures, acceptance criteria and test results. This group conducts any tabletop discussion on expected simulator response.

Senior Operations Instructor: John V. Shriver

Educational Background: Navy Nuclear Power Training
Bachelor of Science, Physics-Applied Nuclear Science
Winona State University, Winona, MN

Experience: Fourteen years Nuclear Plant experience including six years Naval Service and eight years as a Operations Instructor/Simulator Maintenance at the Monticello site.

Instrument & Control Technician: Darrel Alcott

Educational Background: High School Diploma

Experience: Fifteen years experience at Monticello Nuclear in both the plant and the simulator area as an I&C Specialist and Instructor.

Certifications: MNGP Reactor Operator License - Docket No. 55-31150
INPO SRO Certification

Technical Support Training Supervisor: Douglas Horgen
(Simulator Supervisor)

Educational Background: Bachelor of Arts, Chemistry and Physics
Master of Science, Physics and Math

Experience: Fifteen years experience including five years Naval service and ten years with NSP. Two years in Corporate Quality Assurance and seven years as the Technical Support Training Supervisor.

Certifications: NSP Lead Auditor Certification
NSP Production Training Department Advanced Instructor Certified

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CERTIFICATION REVIEW GROUP (Cont'd)

Appendix #12

Shift Supervisor: Claude Banyai

Educational Background: High School Diploma
Three years college coursework towards a
Bachelor of Science degree

Experience: Fifteen years experience in the Nuclear field ad the Monticello site. Seven years as a Reactor Operator of which two years were in the Lead Reactor Operator position; three years as a Shift Supervisor.

Certifications: MNGP Reactor Operator License
MNGP Senior Reactor Operator License
Chief Boiler License

Operations Training Supervisor: Robert C. McGillic

Educational Background: High School Diploma
Navy Nuclear Power Training

Experience: Eighteen years experience in the Nuclear field including eight years Naval service and tens years in the area of Radiation Protection and Operations Training.

Certifications: MNGP Senior Reactor Operator License
NSP Production Training Department Advanced Instructor Certified

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MONTICELLO SIMULATOR CERTIFICATION REPORT

Appendix #13

FOUR YEAR PLAN FOR CERTIFICATION TESTING

Simulator certification testing required by ANSI/ANS 3.5-1985 will be accomplished as follows:

Normal Plant Evolutions:

Normal Plant Evolutions, Section 3.1.1 will be tested on an annual basis.

Steady State Performance:

Steady State Operating tests, Section 4.1 and Appendix B will be tested on an annual basis.

Transient Performance:

Transient Performance tests, Section 4.3.1 and Appendix B will be tested on an annual basis.

Computer Real Time:

Computer Real Time tests, Section 3.1.1 will be tested on an annual basis

Simulator Environment:

Simulator environment and physical fidelity testing, Section 3.2.1 and 3.2.2 will be completed once every 4 years.

Malfunctions:

Malfunction tests, Section 3.1.2 will be performed over the next four years at a rate of 25% per year. Therefore, approximately 64 tests will be performed each year. If the total number of malfunction tests change, the number performed in that year and subsequent years will be adjusted accordingly.