U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report Nos. 50-317/86-22; 50-318/86-22

Docket Nos. 50-317; 50-318

License Nos. DPR-53; DPR-69

Licensee: Baltimore Gas and Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Units 1 and 2

Meeting At: USNRC Region I Office, King of Prussia, Pennsylvania

Meeting Conducted: October 8, 1986

Prepared By: D. F. Limroth, Project Engineer

Appoved By: L. E. Tripp 10/9/86
L. E. Tripp, Chief, Reactor Projects Section 3A Date

Meeting Summary: Meeting on October 8, 1986 (Combined Report 50-317/86-22; 50-317/86-22)

Scope: Management meeting held to provide the licensee the opportunity to present information relative to recommendations in SALP Report 50-317/84-99; 50-318/84-99. Information relative to 10-year ISI plans was also presented.

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DETAILS

1. Meeting Attendees

Baltimore Gas and Electric Company (BG&E)

J. R. Lemons, Manager - Nuclear Operations
W. J. Lippold, Manager - Nuclear Engineering Services
A. R. Thornton, General Supervisor - Plant and Project Engineering
R. F. Ash, General Supervisor - Design Engineering
B. C. Rudell, Senior Engineer - Performance Engineering

NRC Region I

S. J. Collins, Deputy Director, Division of Reactor Projects (DRP)
W. V. Johnston, Deputy Director, Division of Reactor Safety (DRS)
E. C. Wenzinger, Chief, Projects Branch No. 3, DRP
J. P. Durr, Chief, Engineering Branch 3, DRS
L. H. Bettenhausen, Chief, Operations Branch, DRS
L. E. Tripp, Chief, Reactor Projects Section 3A, DRP
J. R. Johnson, Chief, Operational Programs Section, DRS
N. J. Blumberg, Lead Reactor Engineer, OPS, DRS
D. F. Limroth, Project Engineer, RPS 3A, DRP

2. Background

Systematic Assessment of Licensee Performance (SALP) Report 50-317/84-99; 50-318/84-99 contained recommendations that a meeting be scheduled to discuss licensee plans for better integration of engineering support into modification and outage activities, and for discussions regarding the licensee's trip reduction program efforts.

3. Discussion

During this meeting, BG&E made presentations covering the following:

-- Integration of engineering support into modification and outage activities.

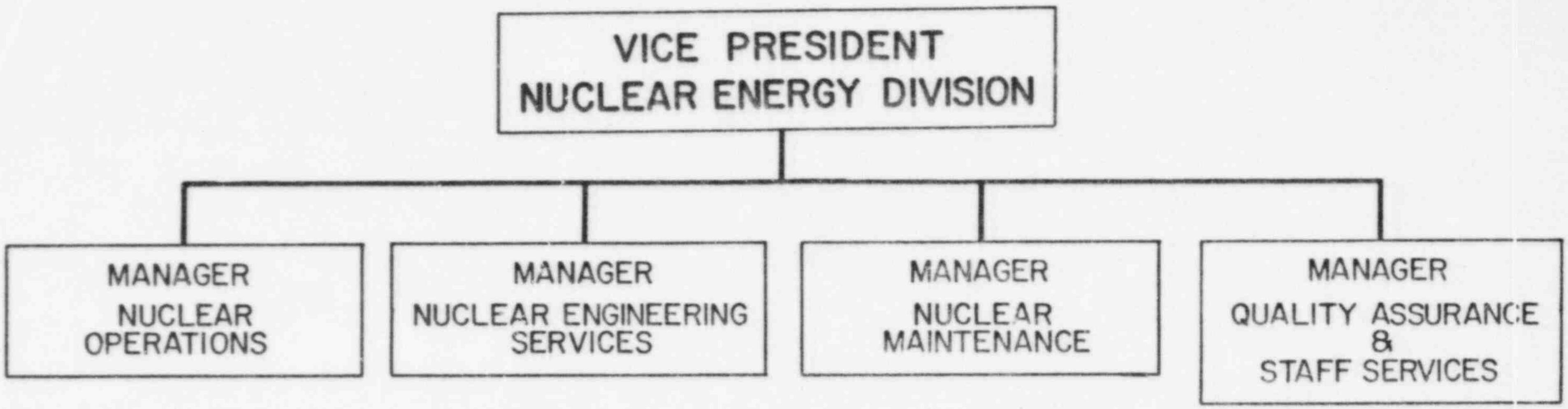
-- Trip reduction program.

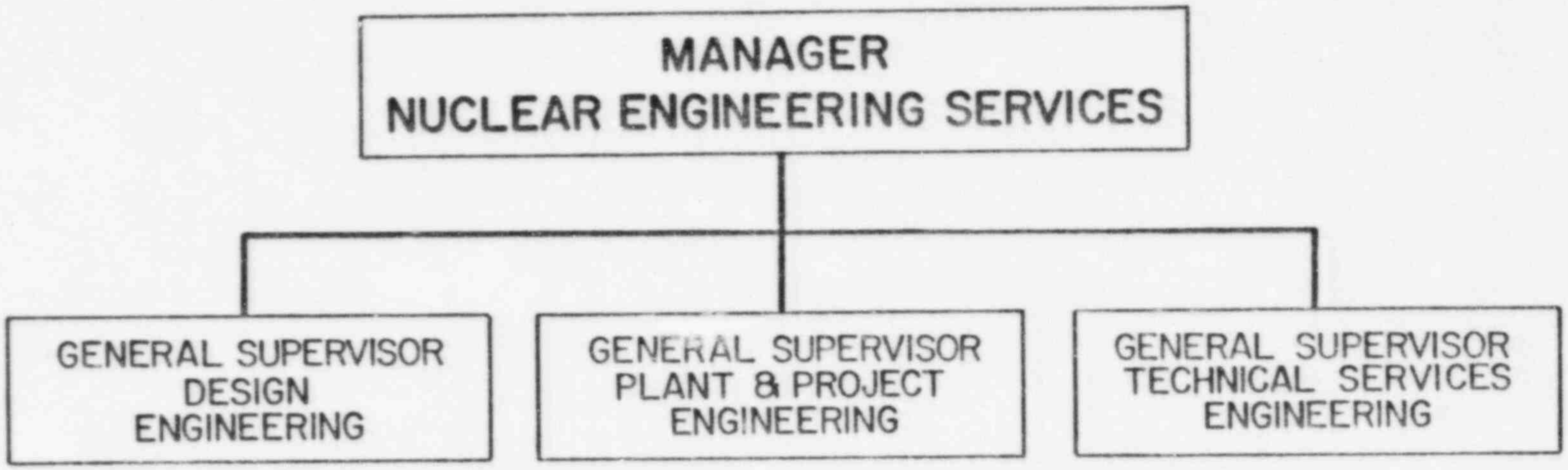
-- 10-year inservice inspection plans.

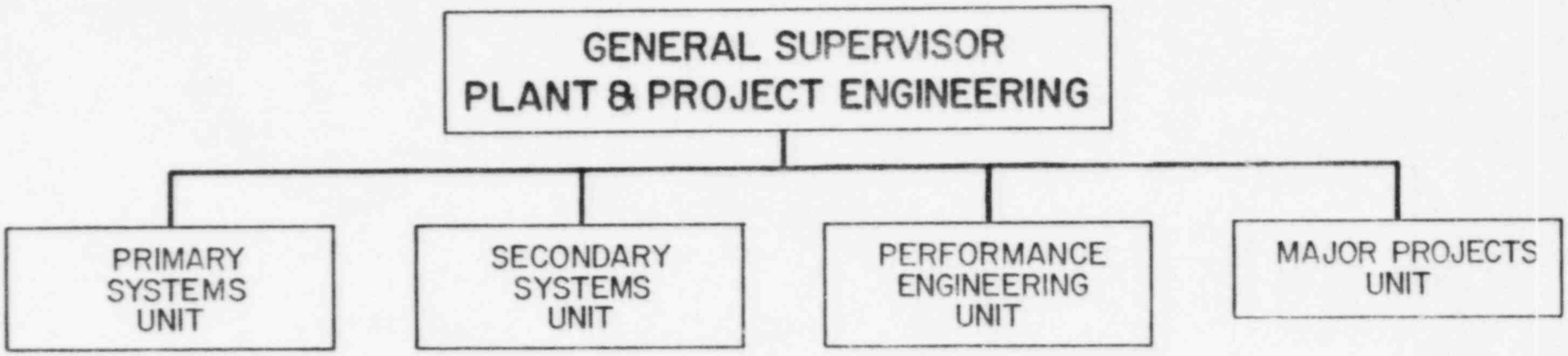
Outlines of these presentations are attached.

The meeting was marked with an openness and a sense of cooperation on the part of the licensee. It was noted that aggressive and innovative actions are underway to improve licensee management effectiveness and accountability.

During the meeting, the licensee agreed to provide information relative to initiatives to increase reactor protective system surveillance testing periodicity from monthly to quarterly.

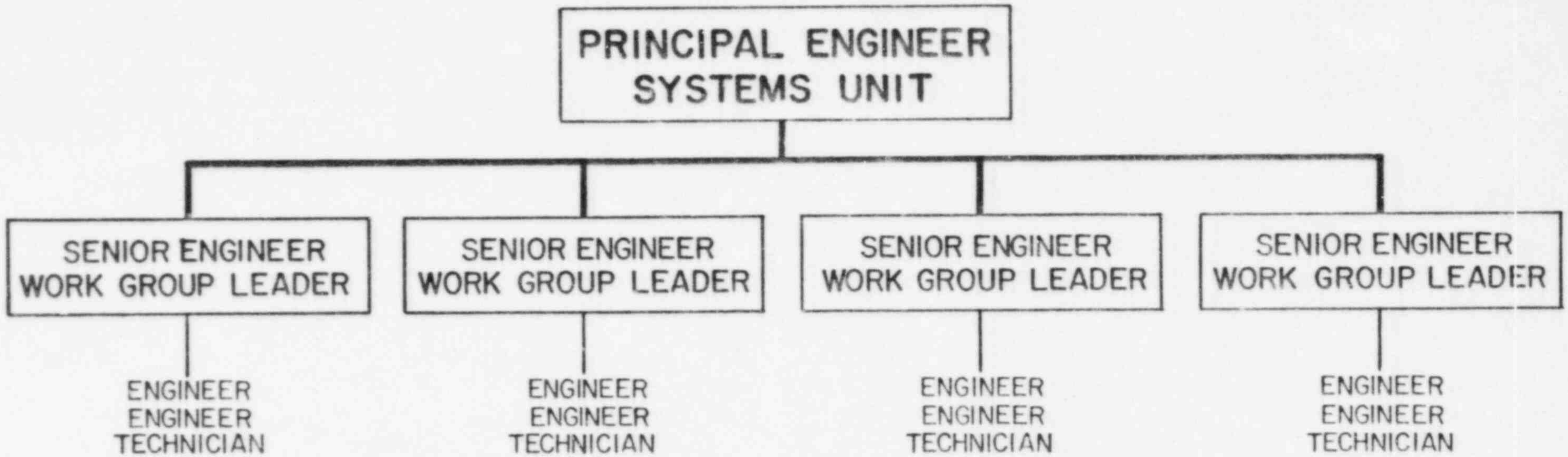

VICE PRESIDENT
NUCLEAR ENERGY DIVISION
MANAGER
NUCLEAR
OPERATIONS
MANAGER
NUCLEAR ENGINEERING
SERVICES
MANAGER
NUCLEAR
MAINTENANCE
MANAGER
QUALITY ASSURANCE
&
STAFF SERVICES


MANAGER
NUCLEAR ENGINEERING SERVICES
GENERAL SUPERVISOR
DESIGN
ENGINEERING
GENERAL SUPERVISOR
PLANT & PROJECT
ENGINEERING
GENERAL SUPERVISOR
TECHNICAL SERVICES
ENGINEERING


GENERAL SUPERVISOR
PLANT & PROJECT ENGINEERING
PRIMARY SYSTEMS UNIT
SECONDARY SYSTEMS UNIT
PERFORMANCE ENGINEERING UNIT
MAJOR PROJECTS UNIT

Purpose of System Engineer Organization

- To better integrate engineering support into system operation, maintenance, and modifications.
- To develop system experts who are responsible for the overall well-being of the system - includes addressing operations, maintenance, and performance problems.
- To designate one project manager for modifications.


PRINCIPAL ENGINEER
SYSTEMS UNIT
SENIOR ENGINEER
WORK GROUP LEADER
ENGINEER
ENGINEER
TECHNICIAN
SENIOR ENGINEER
WORK GROUP LEADER
ENGINEER
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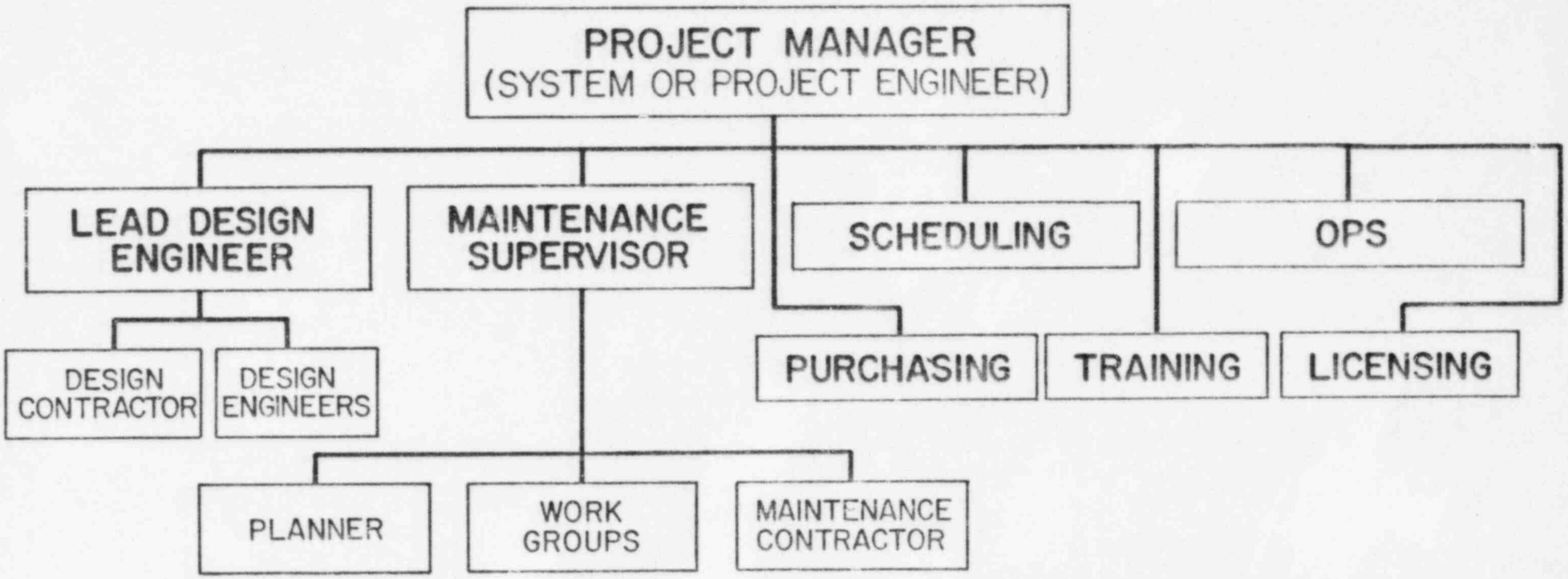
ENGINEER
TECHNICIAN

MATRIX ORGANIZATION



TRIP EVALUATION AND RECOVERY GROUP

Function:

- Evaluate trip/forced outage/event
- Determine root cause
- Correct the problem

TERG Leader:
Principal Engineer, Systems Unit

Members:
System Engineer and/or Work Group Leader
Operations Procedures Development Unit Supervisor
Mechanical Assistant General Supervisor
Electric and Controls Assistant General Supervisor
Design Engineer
Operational Safety Engineer

REACTOR TRIP REDUCTION TASK FORCE

REPORT

INTRODUCTION:

On February 18, 1986, the Manager-Nuclear Operations, assembled a Reactor Trip Reduction Task Force to evaluate ways to reduce the number of reactor trips experienced at Calvert Cliffs and to make appropriate recommendations to Management. The Task Force was specifically charged with reviewing the record of trips at Calvert Cliffs, evaluating the INPO and Combustion Engineering Owners' Group trip reduction recommendations, and evaluating actions taken to minimize reactor trips at nuclear power plants with superior trip records.

MEMBERSHIP:

The Reactor Trip Reduction Task Force was composed of the following members:

John Carroll, Chairman
Joe Crunkleton
Niall Hunt
John Lohr
Paul Pieringer
Payson Sierer
Jim Snyder

METHODOLOGY:

The work of the Task Force was divided into six tasks, each of which was assigned to a task leader. For each task, a specific set of questions was developed. Attachment 1 outlines the task assignments and related questions. Each task leader was charged with researching each question and preparing working papers for discussion by the full Task Force.

Recommendations representative of the concensus of the membership were developed at Task Force meetings. Due to the difficulty in quantifying the benefit achievable from each recommendation, numerical benefit/cost ratios were not developed. As an alternative, somewhat subjective benefit and cost values of high, medium, or low were assigned to each recommendation. Only those recommendations which the Task Force considered to be cost effective were included in the final list. A department to assume responsibility for each recommendation was also suggested.

During the course of the work, a number of nuclear power plants were contacted, including several cited by INPO as having superior records with regard to the number of reactor trips experienced. One plant visit was also conducted. Unfortunately, these contacts yielded little information of value. None of the plants contacted had taken formal measures to improve or maintain their performance in this area. They attributed their success to a variety of causes such as conscientious, experienced operators, reliable design, preventive maintenance on the feedwater system, and motor-driven feed pumps.

Recommendations from INPO Report 85-011, "Scram Reduction Practices", were not issued until May 1985, and therefore have little to do with the success of the plants contacted. It may be significant to note that two of the plants used in generating the INPO recommendations have since fallen on hard times and have experienced numerous trips in recent years.

As a check on the completeness of the Task Force's work, a follow-up review was conducted of Calvert Cliffs' trip history. Where they could be determined, root causes were compared to the Task Force's recommendations to ensure that all known trip causes have been addressed.

RESULTS:

The analysis of plant trip history has shown a steady decline in the annual trip frequency over the period from 1977 to 1985, indicating that existing plant practices, such as limiting the extent of at-power testing, have been at least partially successful in reducing the source of plant trips. To continue this trend, it is imperative that a high priority be given to completing programs currently in place to reduce trips. Such programs include: RCP surge capacitors, secondary steam pipe ruptures, fish kills, RCP seal failures, reactor trip breaker failures, main feed pump high pressure oil hose failures, and screen wash piping ruptures. All of these programs address failures that have each caused one or more reactor trips and have significant future trip potential. It is also vitally important that the maintenance, design, and operation of balance of plant equipment which can result in plant trips be conducted with the same degree of care as is afforded safety-related components.

Trip frequency contributors can be broken down into three categories:

1. Trips originating from human error;

2. Trips originating from random hardware failures; and

3. Trips originating from repetitive failures.

The relative contribution of each of the above can be seen from the trip frequency histograms provided in Figures 1 and 2. Figure 1 depicts the total number of plant trips for the years 1977 to 1985. As previously mentioned, it is illustrative of the decline in the number of trips experienced over these years. Figure 2 depicts the number of trips experienced over the same period but with all repetitive trips and personnel error induced trips removed from the data base.

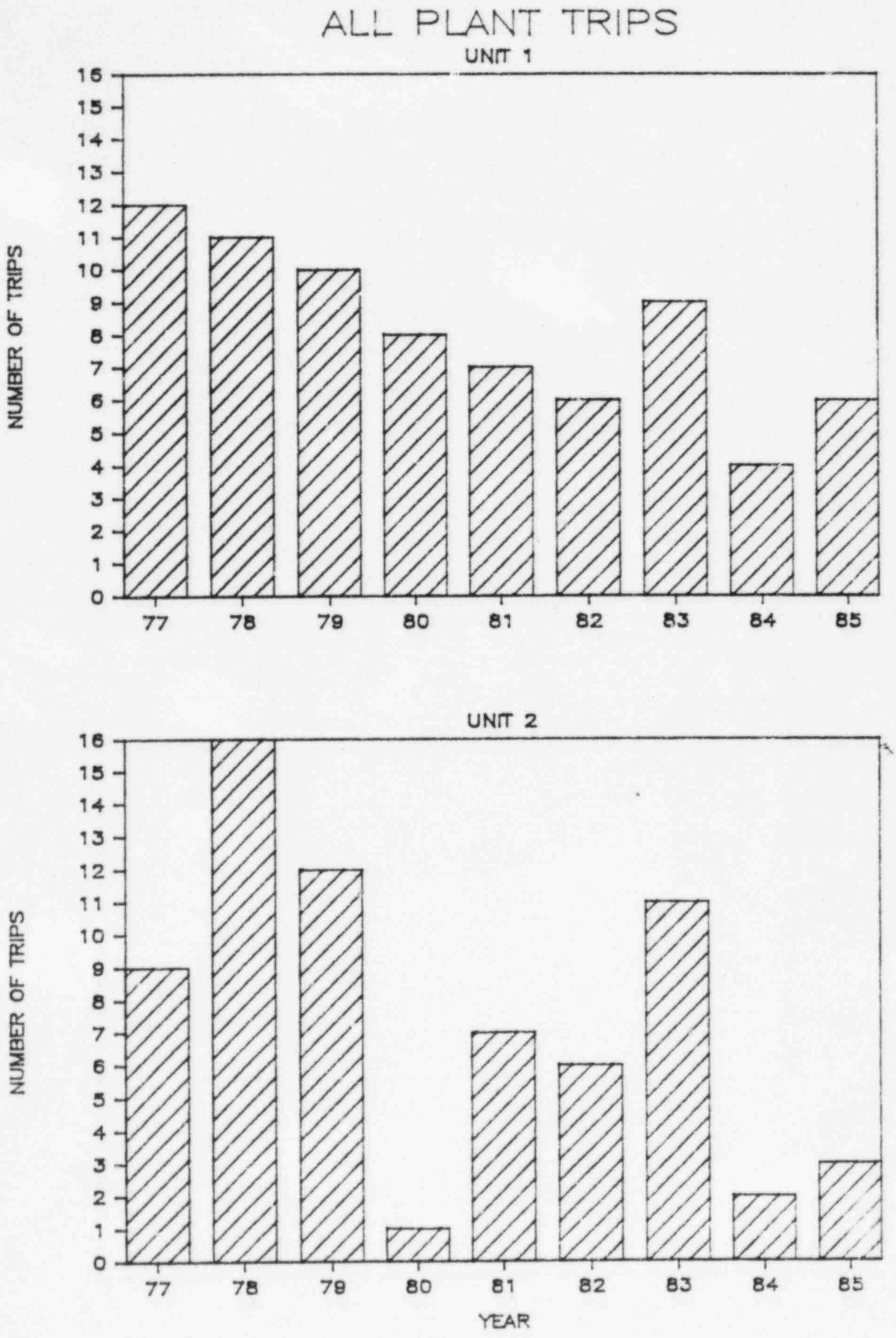
It implies that even if we could prevent all personnel errors through improved procedures, training, awareness, and operating practices, and if we were able to adequately treat all problems and failures to prevent their recurrence, we would still likely experience two to three trips per year per unit as a result of random hardware failures. Therefore, it becomes evident that our present programs by themselves will not allow us to meet our Divisional goal of one trip per year per unit. Thus another level of sophistication must be applied in our trip reduction program. To this end, the Task Force explored methods for reducing the trip potential of all activities that occur at Calvert Cliffs. In addition to reviewing and correcting conditions which have caused trips, conditions which effect the potential for causing trips were also evaluated.

The Task Force's evaluation resulted in a relatively large number of actions which as a group will likely make a noticeable difference in the number of trips experienced. As expected, the Task Force was unable to indentify one or even a handful of significant recommendations, implementation of which would achieve our goals. These recommendations, divided into categories, are presented in Attachment 2 as follows:

- HARDWARE
- SETPOINT
- WORK PRACTICES
- AWARENESS
- ADMINISTRATIVE
- POST-TRIP
- PROCEDURE
- ADDITIONAL TESTING
- TRAINING

While an attempt has been made to prioritize the recommendations by relative benefit and cost, implementation of all, or certainly most, of the recommendations is necessary if the number of trips experienced is to be noticeably reduced.

FIGURE 1


ALL PLANT TRIPS
UNIT 1
NUMBER OF TRIPS
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
77
78
79
80
81
82
83
84
85
UNIT 2
NUMBER OF TRIPS
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
77
78
79
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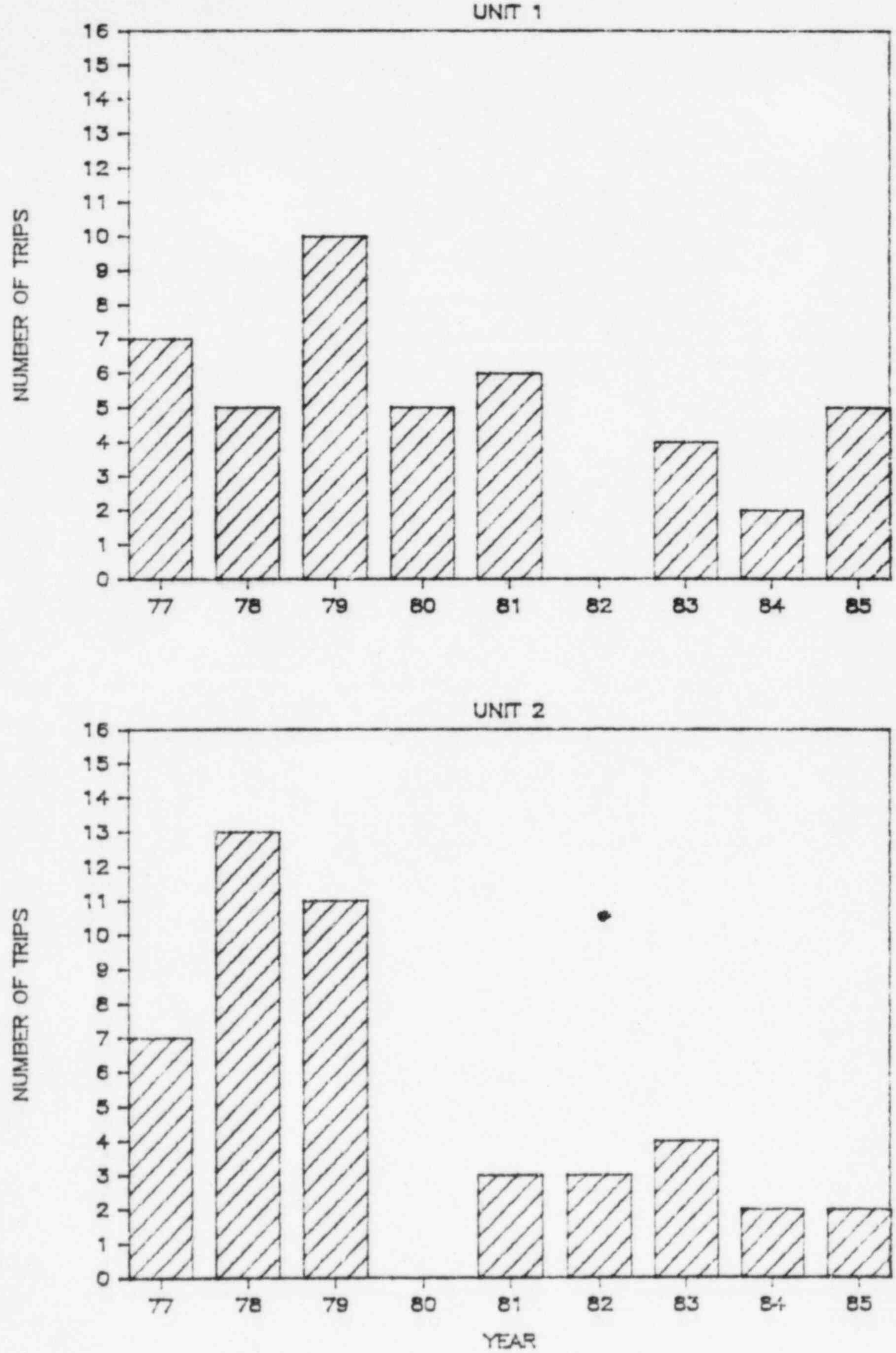
81
82
83
84
85
YEAR

FIGURE 2

EXCLUDING ERRORS & REPETITIVE EVENTS



REACTOR TRIP REDUCTION

TASK FORCE

TASKS

I. REVIEW CCNPP TRIP HISTORY:

Task Leader - Niall Hunt

A. What are the root causes for trips?

B. Have past preventive actions been successful in preventing recurrences?

C. Determine if any unrecognized pattern or failure syndrome exists and is still active.

II. REVIEW CEOG/INPO RECOMMENDATIONS:

Task Leader - John Lohr

A. Which recommendations do we fail to meet?

B. Do plants with superior trip performance adhere to the recommendations to a greater extent?

C. Which nuclear plants merit further study?

III. REVIEW CCNPP TRIP INITIATORS:

Task Leader - Jim Snyder

A. What devices can trip the reactor?

B. How does our protective system compare to other similar plants?

C. Can some of these devices be removed without unacceptable loss of protection?

D. What testing is currently being performed in MODE 1 that potentially challenges the protective systems assuming one single failure?

E. What MODE 1 testing should be deferred until the unit is shut down?

F. Can setpoints of initiating devices be changed to increase margin to trip setpoints during testing and operation?

G. Can time delays be used in trip circuits to minimize trips?

H. Are trip initiating circuits being adequately maintained?

I. What is vulnerability of trip initiating devices to electrical grounds?

J. Are existing ground detection devices and procedures adequate to facilitate prompt isolation?

K. What is the vulnerbility of trip devices to environmental effects, including mechanical shock?

L. Are installed indicating devices sufficient to monitor conditions which may result in a trip?

IV. REVIEW PERSONNEL RELATED FACTORS:

Task Leader – Joe Crunkleton

A. Are personnel at Calvert Cliffs sufficiently sensitized to the trip reduction issue?

B. What programs exist at Calvert Cliffs to sensitize personnel to the trip reduction issue?

C. What programs exist outside Calvert Cliffs to sensitize personnel to the trip reduction issue?

D. Is QC coverage sufficient during evolutions of high trip potential?

E. Is supervisor screening of MRs sufficient to identify those evolutions with high trip potential?

F. Is the Control Room Supervisor's involvement sufficient during evolutions of high trip potential?

G. Does the lack of formal Control Room atmosphere contribute to increased frequency of reactor trips?

H. Is it desirable to institute the two-man rule or worker/reader concepts during high risk evolutions?

I. Are procedures and controls adequate for those evolutions involving high trip potential?

J. Should high risk evolutions be preceded by a briefing session?

K. Should system engineers play a more active role in testing and maintenance which has a high risk potential?

L. Would the adoption of plant-wide formal communication practices be beneficial?

V. REVIEW POST-TRIP PRACTICES:

Task Leader – Payson Sierer

A. Is the post-trip review process/procedure adequate to facilitate determination of the root cause?

B. Is sufficient information available to allow cause of the trip to be identified?

C. How many trips have we failed to identify root causes for?

VI. REVIEW HUMAN FACTOR ISSUES:

Task Leader – Paul Pieringer

A. Is equipment with high trip potential adequately identified?

B. Are human factor principles adequately applied to the equipment/repairman interface?

Responsibility: NESD
Benefit: High
Cost: Low

HARDWARE RECOMMENDATION #1

If feasible, remove the steam generator feed pump and condensate booster pump protective trips on low suction pressure.

DISCUSSION

Both Unit 1 and Unit 2 have experienced reactor trips resulting from upsets in the condensate system which have resulted in tripping the steam generator feed pumps and/or condensate booster pumps on low suction pressure.

It is recommended that an engineering evaluation be performed to determine if it is feasible to remove these low suction pressure trips. MPR Associates, Inc., made such a recommendation in their final report for Phase 1 of the Calvert Cliffs Feedwater and Condensate System Reliability Improvement Program. MPR Associates' basis for removing the low suction pressure trip is that short-term cavitation is not a major threat to the pumps. The Reactor Trip Reduction Task Force also noted that in the event of gross cavitation, the affects would be self-limiting in that the reactor would trip on low steam generator level, main feed flow would then be reduced to 5% of full flow, and feedwater temperature would drop appreciably due to cessation of extraction steam flow to the feedwater heaters. In addition, low pressure in the condensate header is annunciated in the Control Room. Should cavitation occur, sufficient time is available for the Control Room Operators to take action before pump damage occurs.

If it is not feasible to defeat the steam generator feed pump and condensate booster pumps' low suction pressure trip, then an appropriate time delay with staggered trip setpoints should be added. Removal of the trips would have an advantage over installing a time delay, in that removal of the trip would eliminate a potential source of spurious trips due to instrument malfunctioning, human error, grounds, etc.

Responsibility: NESD
Benefit: High
Cost: High

HARDWARE RECOMMENDATION #2

Review the main turbine and feed pump turbine protection logic circuits for single failure paths, assess the reliability of such circuits, and enhance as required.

DISCUSSION

Many of the main turbine and feed pump turbine trips are a one of one logic design. A single component failure in these circuits can result in loss of the unit. The reliability of such circuits should be assessed and redesigned, if appropriate. The following trip circuits were identified as being vulnerable to single failures and are illustrative of a more complete listing which should be developed:

1. Single KT-805 relay at ESFAS (B logic) provides a turbine trip for reactor trip bus UV and/or high steam generator water level.

2. Thrust bearing wear trip on Unit 1 utilizes two pressure switches to sense thrust bearing oil pressure; however, both are dependent on a single device. Failure of this device can result in a turbine trip.

Responsibility: NMD
Benefit: High
Cost: Low

WORK PRACTICES RECOMMENDATION #1

Establish a requirement to perform ground checks before and after working on electrical circuits.

DISCUSSION

Presently, Operations does ground checks once per shift; therefore, a ground may go undetected for hours. Additionally, the ground detection circuits are not capable of detecting "loop" grounds in instrument loops.

During maintenance and testing, the possibility that a ground path will be created is significant. Therefore, if a ground exists prior to a task, the introduction of a second path may cause equipment failure or, in some cases, a trip. Checking for grounds prior to maintenance prevents this possibility. Checking for grounds after maintenance ensures that a ground fault hasn't been induced into the system during the maintenance activity.

Responsibility: NESD/NOD
Benefit: High
Cost: Low

POST-TRIP REVIEW RECOMMENDATION #1

Responsibility for post-trip review should be specifically assigned to a permanent group of individuals who have access to the required technical expertise, including reliability/human engineering. Specifically:

- Organize one or two permanent teams for the investigation and evaluation of all plant trips. The permanent team should consist of individuals and alternates trained in the assessment techniques, augmented by technical team members, as necessary.

- The team should commence its investigation immediately after the trip and the team should be responsible for all aspects of trip assessment, including determination that plant response during and after the trip was in accordance with design.

DISCUSSION

The purpose of the post-trip review process is to verify that the plant functioned as designed and to establish the root causes of the trip to permit the development of corrective actions to prevent recurrence of the event. The causes can have their origin in equipments, procedures, personnel or, as is usually the case, a combination of all these factors. Consequently, it is extremely important that an investigation into the root cause of a trip be continued until all contributing factors are considered and evaluated. In many situations, an obvious, easily determined cause may exist which will lead an inexperienced investigator to overlook a significant but less obvious contributing cause. In order to ensure a consistent, thorough investigation into root cause(s) of plant trips, a technically trained team, directed by an experienced investigator following a well-structured approach to event investigation, should be assigned to establish the causes of all trips, however obvious the apparent cause.

The concepts of this recommendation were embodied in the June 13, 1986, letter from J. R. Lemons proposing the creation of a Trip Evaluation and Recovery Group (TERG). This recommendation additionally proposes: requirements for human engineering expertise on the TERG; direction that the TERG evaluate proper plant response following a trip; and that the TERG investigate all plant trips, including those for which the cause is believed to be known within the first hour.

Responsibility: NESD
Benefit: Medium
Cost: Low

PROCEDURE RECOMMENDATION #1

Testing of the Reactor Protective System (RPS) and the Engineered Safety Features Actuation System (ESFAS) should be performed quarterly vice monthly.

DISCUSSION

Several plant trips have occurred during RPS/ESFAS testing. Presently, as required by the Technical Specifications, once a month we degrade our reliability by intentionally inducing trip signals to RPS/ESFAS. During such testing, the ESFAS is effectively reduced to a one of one trip logic. Development of a single failure during these periods may result in a plant trip.

By changing the frequency to quarterly, we also reduce the possibilities for human errors, thereby reducing the challenges to safety systems.

Combustion Engineering has done a study on this issue. R. B. Sydnor and Licensing have reviewed the document. It is recommended this item be pursued with a high priority even if an ESFAS bypass capability is provided as suggested in Hardware Recommendation #10.

Responsibility: NMD
Benefit: Medium
Cost: Low

ADDITIONAL TESTING RECOMMENDATION #1

Integrated, functional testing of all main feed pump and turbine trip circuits should be completed to verify that variation of the sensed parameter actuates the trip function correctly. For those circuits with actuation logic, verification should be made that a single input does not cause an actuation. At a minimum, testing should be performed each refueling outage.

DISCUSSION

Compared to primary trip circuitry, secondary system trip circuits receive less attention yet they have been a major contributor to our trip history. To prevent spurious operation and increase the reliability of these trips, regular testing should be conducted to ensure proper trip circuit operation and accurate setpoints.

October 8, 1986

1986/1987 10-YEAR ISI PREVIEW

10-YEAR REACTOR VESSEL VOLUMETRIC WELD EXAMS

- o WILL ULTRASONICALLY INSPECT ALL ACCESSIBLE BELTLINE REGION WELDS AND THE ASME CODE REQUIRED COVERAGE OF THE NON-BELTLINE REACTOR VESSEL WELDS.
- o AN ULTRASONIC DATA RECORDING AND PROCESSING SYSTEM (UDRPS) WILL BE USED IN CONJUNCTION WITH A CONVENTIONAL SYSTEM.
- o BG&E CONTRACTED TO PURCHASED UDRPS IN DECEMBER 1984. UDRPS WILL USE LASER DISC FOR RECORDING THE DIGITIZED DATA. SIGNAL TO NOISE RATIO AND TARGET MOTION IS USED TO AUTOMATICALLY DETECT REFLECTORS.
- o SOUTHWEST RESEARCH INSTITUTE (SwRI) WILL SUPPLY THE MECHANICAL POSITIONING SYSTEM AND THE ULTRASONIC TESTING SYSTEM.
- o APPROXIMATELY 12 DAYS ARE SCHEDULED FOR COMPLETING THE REACTOR VESSEL EXAMS. CRITICAL PATH TIME IS APPROXIMATELY 3 DAYS SINCE THE REACTOR COOLANT PUMP OVERHAUL IS SCHEDULED PARALLEL WITH THE EXAMINATION.
- o WILL PERFORM THE NEXT 10-YEAR INTERVAL OUTLET NOZZLE BORE EXAMINATIONS DURING THIS INSPECTION.
- o HAVE PERFORMED BELTLINE REGION CRITICAL FLAW SIZE FRACTURE MECHANICS CALCULATIONS AND WILL COMPLETE VESSEL NOZZLE, LOWER HEAD TO LOWER SHELL AND FLANGE REGION FRACTURE MECHANICS TO EXPAND FLAW ACCEPTANCE CRITERIA BEFORE THE INSPECTION. THIS MAY ELIMINATE CRITICAL PATH TIME IN THE EVENT A FLAW IS FOUND THAT EXCEEDS STANDARD CODE ACCEPTANCE CRITERIA.
- o REACTOR VESSEL NOZZLE PLUGS WILL BE USED TO PERMIT OVERHAUL OF SHUTDOWN COOLING VALVES, HERMAVALVE MODIFICATIONS AND REACTOR COOLANT PUMP WORK TO BE PERFORMED SIMULTANEOUSLY WITH REACTOR VESSEL INSPECTIONS.

10-YEAR REACTOR VESSEL INTERNALS VISUAL EXAM

- WILL PERFORM AN UNDERWATER CAMERA INSPECTION OF THE STRUCTURAL COMPONENTS WITHIN THE REACTOR VESSEL, CORE BARREL AND UPPER GUIDE STRUCTURE.
- SwRI WILL SUPPLY THE UNDERWATER REMOTE VISUAL EXAMINATION EQUIPMENT.
- LOOSE PARTS SEARCH AND RETRIEVAL WILL BE PERFORMED EARLY TO IDENTIFY AND RECOVER ANY FOREIGN OBJECTS.
- INSPECTION WILL BE VIDEO RECORDED WITH VOICE DESCRIPTION.

CLASS 1 VALVE INTERNALS

- ONLY ONE CATEGORY REMAINS TO COMPLETE THE 10-YEAR VALVE INTERNALS INSPECTION REQUIREMENTS. EITHER SI-651 OR 652-MOV MUST BE DISASSEMBLED FOR INTERNALS INSPECTION. HAVE ELECTED TO OVERHAUL BOTH VALVES SINCE OFFLOAD OF FUEL PROVIDES THE OPPORTUNITY TO DO THIS WORK WITHOUT IMPACTING AN OUTAGE SCHEDULE.

REACTOR COOLANT PUMP AND MOTOR EXAMS

- WILL ULTRASONICALLY INSPECT THE HIGH STRESS AREAS OF TWO REACTOR COOLANT PUMP MOTOR FLYWHEELS PER UNIT. TECHNICAL SPECIFICATION CHANGE PERMITS FULL FLYWHEEL EXAMS TO COINCIDE WITH OUR RCP MOTOR OVERHAUL SCHEDULE.
- WILL PERFORM A SURFACE EXAM OF THE CASING WELDS OF ONE REACTOR COOLANT PUMP.
- WILL EXAMINE AMPELLERS, BOLTING, SHAFT, BEARINGS, PUMP COVER, AND DIFFUSERS WHEN PUMP IS DISASSEMBLED.

S/G INSPECTION PROGRAM

- PERFORMED A 99% EDDY CURRENT EXAMINATION ON UNIT 1 DURING THE 1985 OUTAGE AND 99% ON UNIT 2 OVER THE LAST TWO OUTAGES.
- SEEING THE FOLLOWING THREE TYPES OF FLAWS:
  - SCATTERED, SMALL VOLUME FLAWS (PIT LIKE CHARACTERISTICS)

- LARGER VOLUME FLAWS WITHIN 10" ABOVE THE TUBE SHEET, PRIMARILY IN HIGH SLUDGE REGIONS ON THE INLET SIDE (LARGE OR MULTIPLE PITS, WASTAGE OR IGA)

- VIBRATION INDUCED WEAR AT THE AVB'S

- o WILL PULL 4 TO 6 TUBE SPECIMENS FROM A STEAM GENERATOR THIS OUTAGE. CE WILL REMOVE THE SPECIMENS AND SwRI WILL PERFORM THE DESTRUCTIVE EXAMINATIONS.

- o RESEARCHING AN ULTRASONIC METHOD TO EXAMINE S/G TUBES WHICH SHOULD PROVIDE MORE QUALITATIVE INFORMATION ON FLAW CHARACTERISTICS.

- o SECONDARY SIDE INSPECTIONS OF THE STEAM GENERATORS WILL INCLUDE:

  - J-TUBE EROSION ULTRASONIC INSPECTION,
  - FEED/AUX FEED RING SUPPORT VISUAL INSPECTION,
  - DISTRIBUTION BOX/THERMAL SLEEVE EROSION VISUAL INSPECTION,
  - OUTLET DEFLECTION PLATE BOLTING INSPECTION, AND
  - GENERAL CORROSION PRODUCT SAMPLE ANALYSIS.

CLASS 1,2 AND 3 HYDROSTATIC PRESSURE TESTING PROGRAM

- o APPROXIMATELY 12 HYDRO TESTS REMAIN PER UNIT.

- o WILL HAVE MINIMUM IMPACT ON OUTAGE SCHEDULE DUE TO EARLY IMPLEMENTATION OF THIS PROGRAM.

SECONDARY STEAM EROSION/CORROSION PROGRAM

- o BEGAN A FORMAL PROGRAM TO INSPECT FOR E/C PROBLEMS IN 1984 WITH THE FOLLOWING RESULTS:

	UNIT 1	UNIT 2	
TOTAL EXAM AREAS	2276	3035	
INSPECTION CYCLE DATES	4/85	5/84	11/85
NUMBER INSPECTED	219	367	173
YELLOW ALERT RESULTS	15	30	24

	UNIT 1		UNIT 2
RED ALERT RESULTS	28	31	28
UNSATISFACTORY RESULTS	57	52	21

- o APPROXIMATELY 230 AREAS HAVE BEEN SELECTED FOR INSPECTION DURING THIS UNIT 1 OUTAGE.
- o NO GE SUPPLIED COLD REHEAT PROBLEMS ARE ANTICIPATED. W COLD REHEAT WILL NEED MAJOR REPLACEMENT.

STEAM/FEEDWATER SUPPORT INSPECTION PROGRAM

- o DEVELOPED THIS NEW PROGRAM AS A RESULT OF AN OUTAGE CRITIQUE ITEM.
- o PROGRAM WILL ENCOMPASS VISUAL EXAMS, MAGNETIC PARTICAL EXAMS, AND SOME VIBRATION MEASUREMENTS.
- o APPROXIMATELY 150 SUPPORTS HAVE BEEN SELECTED FOR INSPECTION DURING THIS UNIT 1 OUTAGE.

SALT WATER SYSTEM INSPECTION PROGRAM

- o TWO MAJOR PROBLEMS ARE:
  - GRAFITIZATION OF CASTED COMPONENTS AND
  - CORROSION OF CONCRETE LINED COMPONENTS.
- o CASTING GRAFITIZATION EXAMINATION PROGRAM BEGAN IN 1984.
- o FORMAL CORROSION EXAMINATION PROGRAM FOR WALL THINNING NOW DEVELOPED. APPROXIMATELY 30 PIPING SECTIONS ON EACH UNIT WILL BE INSPECTED ON A TWO YEAR FREQUENCY.

OTHER ISI ACTIVITIES

- o BORIC ACID SYSTEM CARBON STEEL BOLTING EXAMINATION PROGRAM
- o BALANCE OF CLASS 1&2 WELD AND SUPPORT INSPECTIONS
- o SERVICE WATER, COMPONENT COOLING, AND FEEDWATER HEAT EXCHANGER EDDY CURRENT EXAMINATION
- o CONDENSER TUBE EDDY CURRENT EXAMINATION