U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos.: 50-528/89-55, 50-529/89-55, 50-530/89-55

Docket Nos.: 50-528, 50-529, 50-530

License Nos.: NPF-41, NPF-51, and NPF-74

Licensee: Arizona Nuclear Power Project
P. O. Box 52034
Phoenix, Arizona 85072-2034

Facility Name: Palo Verde Nuclear Generating Station, Units 1, 2 and 3

Meeting Location: Arizona Public Service Company (APS) Corporate Offices
Phoenix, Arizona

Meeting Conducted: December 1, 1989

Approved by: for H. J. Wong, Chief
Projects Section II

12/28/89
Date Signed

Summary

A management meeting was held on December 1, 1989 at APS corporate offices to discuss the NRC Systematic Assessment of Licensee Performance for the period ending October 31, 1989. The NRC's initial SALP report was issued as Report Nos. 50-528/529/530/89-48. Recent operational problems, management issues, and licensee corrective actions were also discussed.

DETAILS

1. Meeting Attendees

Arizona Nuclear Power Project (ANPP)

O. DeMichele, Chief Executive Officer
W. Conway, Executive Vice President
J. Levine, Vice President Nuclear
J. Bailey, Vice President, Licensing and Nuclear Safety
B. Ballard, Director, Quality Assurance
J. Allen, Director, Engineering and Construction
W. Marsh, Plant Director
T. Cogburn, Acting Director, Standards and Technical Support
W. Ide, Unit 1 Plant Manager
D. Heinicke, Unit 2 Plant Manager
R. Adney, Unit 3 Plant Manager
P. Hughes, Manager, Radiation Protection and Chemistry
D. Andrews, Public Affairs

Nuclear Regulatory Commission

J. Martin, Regional Administrator, Region V
G. Knighton, Director PDV, NRR
A. Chaffee, Deputy Director, Division of Reactor Safety and Projects
G. Yuhas, Chief, Emergency Preparedness and Radiation Protection Branch
S. Richards, Section Chief
T. Chan, NRR Project Manager
T. Polich, Senior Resident Inspector
W. Ang, Project Inspector
G. Cook, Senior Public Affairs Officer
D. Coe, Resident Inspector
F. Ringwald, Resident Inspector
J. Sloan, Resident Inspector

2. Systematic Assessment of Licensee Performance (SALP)

Mr. Martin started the meeting by stating that the purpose of the meeting was to go over the recently concluded Palo Verde SALP, the conclusions reached by the SALP board, and to provide an opportunity to discuss the SALP before it is finalized. In addition, Mr. Martin stated that the meeting also provided an opportunity for a general status review of the licensee's Unit 3 restart effort and for a discussion of recent plant problems.

The SALP board chairman, Mr. Chaffee, provided an overview of the recently concluded SALP by stating that the board found the overall performance of licensed activities at Palo Verde to be satisfactory and directed toward safe facility operation. Mr. Chaffee noted that the board found that licensee performance continued to decline during the first half of the evaluation period and appeared to improve during the second half. Mr. Chaffee discussed examples noted in the SALP report for

both the declining performance trend and the subsequent improving trend. Mr. Chaffee emphasized that licensee management attention was still needed in the following areas to continue the positive trend:

1) Establish needed engineering presence in all plant activities through the system engineer program and other engineering programs that enhance maintenance and Quality Assurance (QA) performance.

2) Improving the ability of oversight groups and QA to take a leading role in surfacing and resolving significant plant problems.

3) Enhancing the performance of maintenance functions to maintain plant systems in an operable condition.

Mr. Chaffee concluded by stating that significant effort needs to be focused on the above noted areas while still continuing progress in other areas like radiological protection and operations that improved to weak Category 2's during the recently concluded SALP period.

Mr. Richards continued the discussion by reviewing the SALP board conclusions in the areas of Operations, Maintenance/Surveillance, Engineering/Technical Support and Safety Assessment/Quality Verification. He stated that Operations improved due to the relative absence of events attributable to the operations department. However, he also noted that continuing indications of weak performance were still being observed and licensee management needed to further instill a conservative questioning manner in plant operations. Mr. Richards stated that performance in the area of maintenance declined and needed improvement in engineering involvement, improvement of the maintenance backlog, and attention to detail in performance of maintenance activities. The engineering area had the largest number of concerns and its weaknesses were felt in all areas resulting in the Category 3 rating for this functional area. Mr. Richards provided several examples of both negative and positive observation by the SALP board in this area. He stated the need for better focused system engineer functions and their more direct involvement in identifying problems in their systems. Mr. Richards stated that the Category 3 rating in Safety Assessment was indicative of the compliance-oriented QA activities performed in the first half of the evaluation period and the weak performance of the oversight groups. He emphasized that QA and the oversight groups share an equal responsibility for plant problems and recommended that licensee management should insist that they identify problems before the problems become self-revealing.

Mr. Yuhas briefly discussed the appraisal for the areas of Radiological Controls, Emergency Preparedness and Security. Mr. Yuhas attributed the improved Category 2 performance in the Radiological Control area to the increased management commitment to good radiological controls and to improvements in the management staff itself. He stated that licensee management attention was needed to continue the improvement in this area and specifically to devote attention to maintaining radiation monitoring equipment. Mr. Yuhas stated that the area of Emergency Preparedness was rated as a Category 2 with an improving trend due to the increased management involvement in this area and to the improved training

provided. He stated that licensee management should assure that the new management team is fully qualified and staffed for emergencies.

Mr. Yuhas stated that the area of security was rated a Category 2 and noted that training and qualifications were one of its strengths. He recommended management attention to reduce excessive overtime for security personnel and to improve the poor quality of the licensee's closed circuit television security monitoring equipment.

Mr. Martin concluded the NRC discussion of the SALP by stating that the apparent improving trend in the later half of the assessment period gave some reason to be optimistic about future performance. However, he cautioned that the previously discussed recommendations still need attention. Specifically, the need for special attention to improvements in the definition of the system engineer function was important due to the engineering involvement in most problems.

Mr. Conway responded for APS by stating that he agreed in general with the SALP findings. He stated his intentions to continue the improvements initiated and to sustain the management attention to the weaknesses identified by the SALP. He stated that he would provide a written response to the SALP and would continue to keep the NRC informed by meetings, correspondence and briefings.

3. Status Briefing on Unit 3 Pre-Restart Action Items

The NRC-licensee management meeting continued with a briefing on the status of licensee completion of pre-restart action items for Unit 3. Mr. R. Adney, Unit 3 Plant Manager, stated that 152 of 204 action items had been completed and that the remaining 52 items were to be completed prior to entry into Mode 2. Mr. Adney further stated that QA was performing a 100 percent independent review of the action items by performing physical walkdowns and that the management review committee was performing a process overview function. Mr. Martin questioned the completion of various action items. He had observed examples during a plant walk-through the previous day, including a handwheel for a manual operator on an atmospheric dump valve that had "open" direction arrows going both clockwise and counter-clockwise. Mr. Adney reported that they had corrected the condition the previous night by grinding off the incorrect direction arrow on the handwheel. Mr. Martin further expressed a concern with the status of control room discrepancies, with annunciators and instruments which appeared to have existed for several years in some cases. He felt that during a six month outage many of the discrepancies should have been corrected. Mr. Adney responded that they are currently trying to correct the deficiencies and are attempting to have a "black board" by 100 percent power but that the number of annunciator discrepancies is still less than 10. Mr. Conway added that APS would strive to clear up the control room discrepancies. Mr. Martin emphasized that if operators are to be expected to give their best, management should also give their best by correcting the discrepancies that they identify.

Toward the end of the meeting Mr. Adney reported, in response to NRC inquiries, that Unit 3 had a work order backlog of approximately 602 work

orders. He further stated that approximately 150 of those are fire protection program related items.

Mr. Bailey, Chairman of the Management Review Committee (MRC), reported on the MRC's activities and its involvement in the Unit 3 restart program. Mr. Bailey noted that the MRC function was to provide a second look at the activities and not to take the place of the line organization responsibilities. In the process of this discussion, Mr. Bailey stated that the MRC had concluded that the current Unit 3 work backlog of approximately 800 corrective maintenance items and no overdue preventative maintenance items was acceptable for restart. Mr. Ballard continued the discussion by enumerating the role played by QA in the Unit 3 restart effort. Mr. Ballard stated that a special QA monitoring team had been formed to monitor the conduct of operations with operations experienced personnel that has been added to the QA organization. Mr. Ballard added that QA was in the process of reviewing Engineering Evaluation Requests (EER's), performing modification walkdowns, reviewing restart commitment reviews and participating in the MRC.

Mr. Cogburn discussed engineering activities including performance of system walkdowns and EER reviews for Unit 3 restart impact. He stated that joint Engineering Evaluations Department (EED) and Nuclear Engineering Department system walkdowns had been performed on three systems. The walkdowns were critiqued by a senior consultant to obtain enhancements and improved effectiveness for the walkdowns. The walkdowns resulted in identification of various discrepancies such as valve packing leaks and in calculation checks. Mr. Cogburn stated that the walkdowns would be continued in the future. Mr. Allen agreed to provide copies of the walkdown reports to Mr. Martin. With respect to the EER reviews, Mr. Cogburn reported that no items were identified that affected Unit 3 restart that were not already being resolved.

4. Review of Recent Units 1 and 2 Events

Mr. Ide, Unit 1 Plant Manager, continued the discussion by describing the Unit 1 stuck fuel assembly sequence of events and corrective actions. Mr. Ide stated that the stuck fuel assembly resulted from installation of additional assemblies after one of the assemblies (L-14) had been installed without fully seating on its locating pins. Mr. Ide stated that they would be closely evaluating any observed damage to any of the affected fuel assemblies. Mr. Martin questioned the continuance of fuel assembly operations after the first indication of a problem was observed without obtaining management involvement and without a thorough evaluation of the problem at the time it was first identified. Mr. Martin further expressed a concern with the licensee proceeding with the fuel assembly operations in the face of uncertainty when the cause of the problem had not yet been identified.

Mr. Ide continued the discussion by describing another fuel assembly operational occurrence when a wrong fuel assembly was transferred from the spent fuel pool to location K-9 in the reactor. Mr. Ide reported that the occurrence resulted from a typographical error in the material balance area sheets which specified the wrong spent fuel pool location for the affected fuel assembly. Mr. Ide stated that the error was caught

during the installation of the assembly, the operation was halted, the discrepancy was investigated, and the fuel assembly was temporarily stored until the appropriate time for its installation. Mr. Ide continued by describing another occurrence where an incorrect fuel assembly had been partially removed from the spent fuel pool but the error again was caught, the assembly reseated and the correct assembly located and moved. However, the operations manager was not immediately informed by the reactor engineer and consequently had no involvement in the activities occurring at the time. Mr. Martin commented that the occurrences represented continuing examples of the lack of management involvement in the resolution of problems and consequent failure to stop in the face of uncertainty. The occurrences also appeared to show a general lack of respect for the inherent difficulties associated with refueling operations and that management expectations in this regard needed to be made clear. Mr. Cogburn agreed by stating that these occurrences presented further "conditioning opportunities" for the licensee.

Mr. Heinicke, Unit 2 Plant Manager, continued the discussion by reviewing the October 31, 1989 Unit 2 reactor trip which resulted from several failures in the plant protection system. Mr. Heinicke reported that all Unit 2 Reactor Coolant Pump speed probe circuitry had since been inspected and associated problems corrected. He further stated that a temporary modification to jumper the excore instrumentation signal around the linear calibrate switches had been completed and that the switches would be replaced with new style switches in the future. Mr. Heinicke also described the excessive heatup event on November 21, 1989. He stated that an existing Combustion Engineering analysis indicates that the actual conditions that occurred did not adversely affect plant components. He also stated that guidance had been added to operating procedures, lessons learned discussed with the operations crews and unit management has monitored control room supervisors to confirm their ability to exercise adequate command and control.

Mr. Cogburn continued the discussion by describing problems experienced with Auxiliary Feedwater System valves in Units 2 and 3. Mr. Cogburn described problems with overheating motor operators, bent valve stems, and valve part substitutions by the valve vendor. Mr. Cogburn stated that the problems had been and will continue to be resolved accordingly. Specifically valve operability was being verified by testing and parts problems were being resolved by more stringent inventory and parts identification controls.

5. Closing Remarks

Mr. Martin concluded the meeting by stating that the licensee's progress generally provided a favorable impression. He stated that reviews of licensee activities such as this provide a good opportunity to judge the current state of mind. He recognized that the licensee had made a significant effort to get new managers involved in plant activities. He concluded by stating that the effects of the licensee's efforts would be judged in the future.

APS/NRC MANAGEMENT MEETING

AGENDA

DECEMBER 1, 1989

I. OPENING REMARKS

II. STATUS OF PRE-RESTART ACTION ITEMS

- SUMMARY
- ATMOSPHERIC DUMP VALVES (ADV'S)
- STEAM BYPASS CONTROL SYSTEM (SBCS)
- EMERGENCY LIGHTING

III. STATUS OF GENERIC POST-RESTART ACTION ITEMS

IV. UNIT 3 SCHEDULE

V. REPORT OF MANAGEMENT REVIEW COMMITTEE'S ACTIVITIES

- SUMMARY
- ROLE OF QUALITY ASSURANCE
- ENGINEERING WALKDOWNS
- ENGINEERING EVALUATION REQUEST REVIEW

VI. EVENT REVIEWS

- UNIT 1 FUEL ASSEMBLY
- UNIT 2 TRIP
- UNIT 2 HEAT-UP RATE
- AUXILIARY FEEDWATER VALVES

VII. CLOSING REMARKS

OPENING REMARKS

REMARKS BY

J. B. MARTIN, NRC
ADMINISTRATOR, REGION V

AND

W. F. CONWAY, APS
EXECUTIVE VICE PRESIDENT, NUCLEAR

APS/NRC MANAGEMENT MEETING - 12/01/89

STATUS OF PRE-RESTART ACTION ITEMS

* REVIEWS

  - THE REVIEWS IDENTIFIED 204 PRE-RESTART ITEMS

  - THE PRE-RESTART ACTION ITEMS LISTING HAS BEEN PROVIDED TO THE NRC

* VERIFICATION

  - VERIFICATION OF PRE-RESTART ITEMS 100% INDEPENDENT REVIEW BY QUALITY ASSURANCE DEPARTMENT

* PROCESS OVERVIEW

  - MANAGEMENT REVIEW COMMITTEE

STATUS OF PRE-RESTART ACTION ITEMS

* CURRENT STATUS (11/30/89)

  - OF THE 204 IDENTIFIED PRE-RESTART ACTION ITEMS 152 HAVE BEEN COMPLETED

  - 52 IDENTIFIED PRE-RESTART ACTION ITEMS REMAIN TO BE COMPLETED PRIOR TO MODE 2 ENTRY

STATUS OF PRE-RESTART ACTION ITEMS

* ADV RESTART PROGRESS

- 41 TOTAL RESTART ITEMS
- 31 RESTART ITEMS CLOSED
- 10 RESTART ITEMS REMAIN OPEN
  - 7 ITEMS ARE COMPLETED - CLOSURE DOCUMENTATION IS IN REVIEW
  - 2 ITEMS REQUIRE MODE 3 TESTING
  - 1 ITEM IS PENDING COMPLETION OF ALL ADV INSTRUMENT AIR ITEMS

STATUS OF PRE-RESTART ACTION ITEMS

* SBCS RESTART PROGRESS

  - 9 TOTAL RESTART ITEMS

  - 6 RESTART ITEMS CLOSED

  - 3 RESTART ITEMS REMAIN OPEN

    ALL ITEMS REQUIRE MODE 3 TESTING

* EMERGENCY LIGHTING RESTART PROGRESS

  - 12 TOTAL RESTART ITEMS

  - 5 RESTART ITEMS CLOSED

  - 7 RESTART ITEMS REMAIN OPEN

    5 ITEMS ARE COMPLETED - CLOSURE DOCUMENTATION IS IN REVIEW

    2 ITEMS HAVE PM PERFORMANCE ONGOING - MODE 2 RESTRAINT

STATUS OF GENERIC POST-RESTART ACTION ITEMS

* REVIEWS

  - THE REVIEWS IDENTIFIED 140 POST-RESTART ITEMS
  - POST-RESTART LIST WAS REVIEWED BY APPROPRIATE PVNGS SITE DEPARTMENTS
  - POST-RESTART ACTION ITEMS LISTING HAS BEEN PROVIDED TO THE NRC

* VERIFICATION

  - VERIFICATION OF POST-RESTART ITEMS 100% INDEPENDENT REVIEW BY QUALITY ASSURANCE DEPARTMENT

* PROCESS OVERVIEW

  - MANAGEMENT REVIEW COMMITTEE

STATUS OF GENERIC POST-RESTART ACTION ITEMS

* CURRENT STATUS (11/30/89)

  - THERE ARE 140 IDENTIFIED POST-RESTART ACTION ITEMS

  - 90 ITEMS HAVE BEEN COMPLETED AND VERIFIED

  - 50 IDENTIFIED ITEMS REMAIN TO BE COMPLETED

  - 43 OF THE REMAINING ITEMS ARE ARE EXPECTED TO BE COMPLETED NO LATER THAN APRIL 30, 1990

UNIT 3 SCHEDULE

*	MODE 3 ENTRY	11/29/89 COMPLETE
*	ADV TESTING	12/03/89
*	SBCS TESTING	12/08/89
*	MODE 2 ENTRY	12/12/89
*	SYNCHRONIZE TO GRID	12/18/89

REPORT OF MANAGEMENT REVIEW COMMITTEE'S ACTIVITIES

* MANAGEMENT REVIEW COMMITTEE - MRC SCOPE

* UNIT 3 RESTART PROGRAM - MRC REVIEW STATUS

* UNIT 3 RESTART PROGRAM - MRC HIGHLIGHTS

* MRC RESULTS

REPORT OF MANAGEMENT REVIEW COMMITTEE'S ACTIVITIES

* MANAGEMENT REVIEW COMMITTEE (MRC) SCOPE

  - ESTABLISHED: OCTOBER 12, 1989

  - SCOPE: TO PROVIDE DISCIPLINED MANAGEMENT REVIEW, OVERSIGHT AND SELF ASSESSMENT IN CONNECTION WITH STARTUP READINESS, POWER ASCENSION THROUGH 100% POWER OPERATIONS FOR UNIT 3.

  - COMMITTEE MEMBERS:

    VICE PRESIDENT - NUCLEAR SAFETY & LICENSING (CHAIRMAN)

    VICE PRESIDENT - NUCLEAR PRODUCTION

    PLANT DIRECTOR

    PLANT MANAGER - UNIT 3

    DIRECTOR - ENGINEERING & CONSTRUCTION

    DIRECTOR - QUALITY ASSURANCE/QUALITY CONTROL

    DIRECTOR - SITE SERVICES

    DIRECTOR - STANDARDS & TECHNICAL SUPPORT

REPORT OF MANAGEMENT REVIEW COMMITTEE'S ACTIVITIES

* UNIT 3 RESTART PROGRAM - MRC REVIEW STATUS

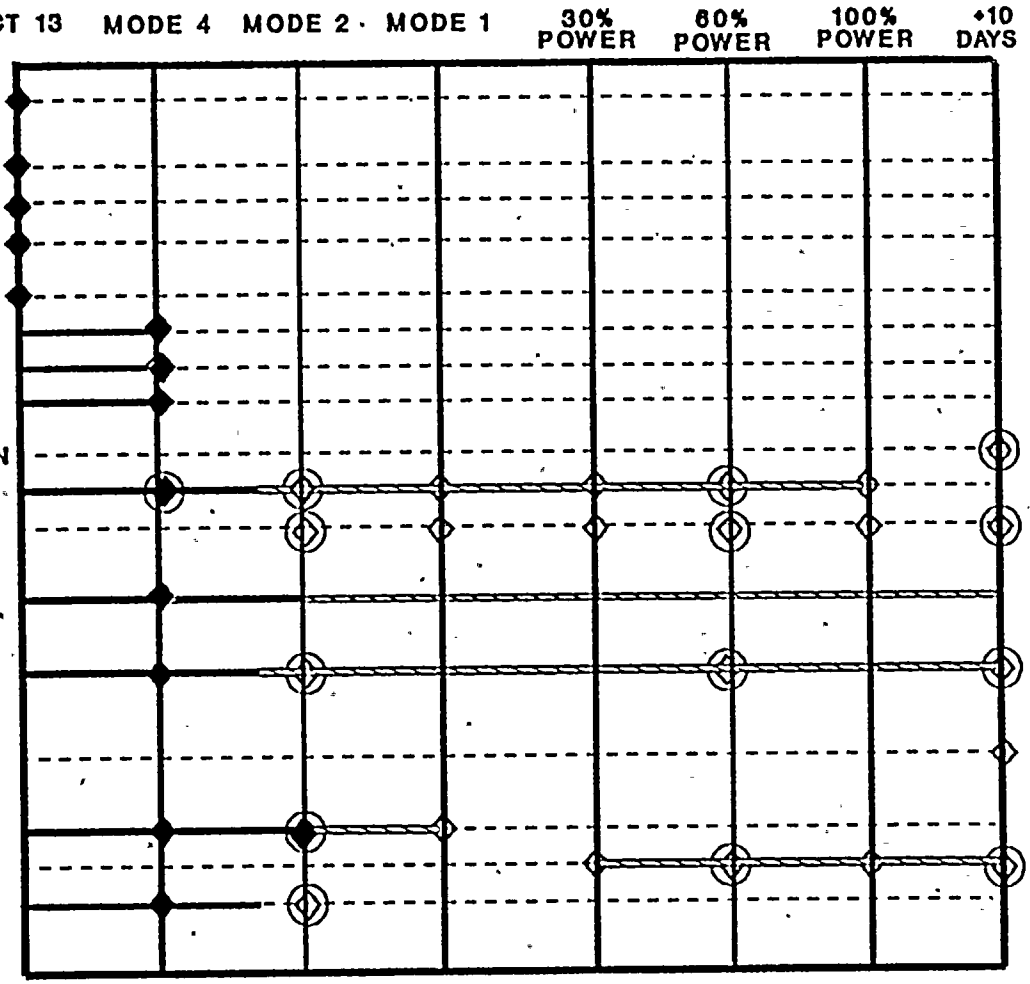
  - MANAGEMENT OVERSIGHT AND INVOLVEMENT

  - PLANT EQUIPMENT AND SUPPORT PERSONNEL

  - OPERATIONS PERSONNEL READINESS

UNIT 3 RESTART PROGRAM

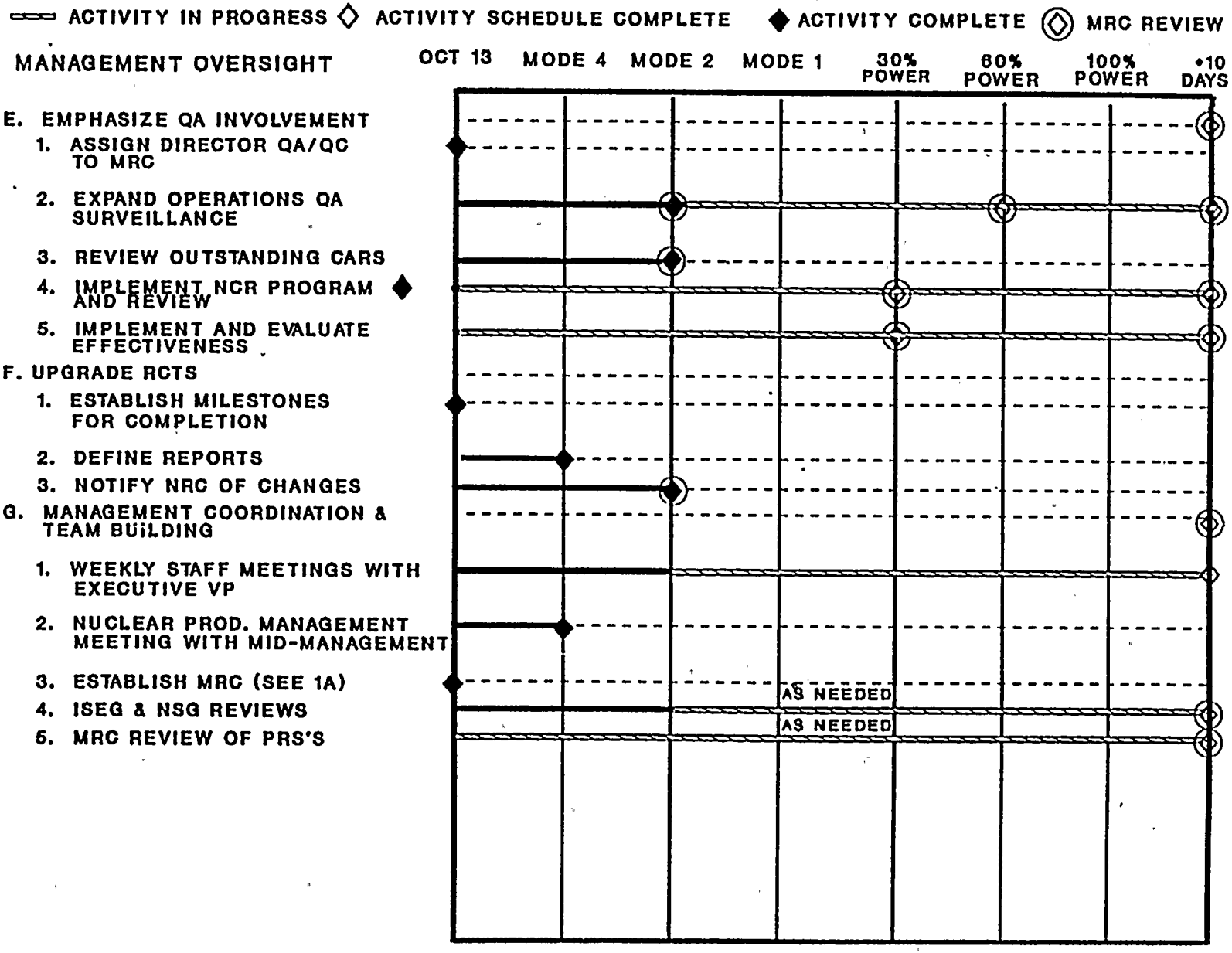
ACTIVITY IN PROGRESS ◇ ACTIVITY SCHEDULE COMPLETE ◆ ACTIVITY COMPLETE ⊛ MRC REVIEW



1. MANAGEMENT OVERSIGHT
   - A. ESTABLISH MANAGEMENT REVIEW COMMITTEE
     1. ISSUE CHARTER
     2. DEFINE EVALUATION AREAS
     3. MEETING SCHEDULE
   - B. ISSUE POLICY STATEMENT
     1. REVIEW WITH MANAGERS
     2. REVIEW WITH SUPERVISORS
     3. REVIEW WITH OPERATING STAFF
   - C. UPGRADE MANAGEMENT OBSERVATION
     1. LINE MANAGEMENT REVIEWS
     2. PLANT MANAGEMENT READINESS TOURS
     3. SELECTED SENIOR MANAGEMENT OBSERVATIONS
     4. MANAGEMENT OBSERVATION TOURS
   - D. PERFORM SELF ASSESSMENTS AT KEY MILESTONES
     1. MODE CHANGE READINESS
     2. PLATEAU WALKDOWNS
     3. MRC REVIEW OF EFDT & LONGSTANDING CONCERN LIST

STATUS 12/01/89

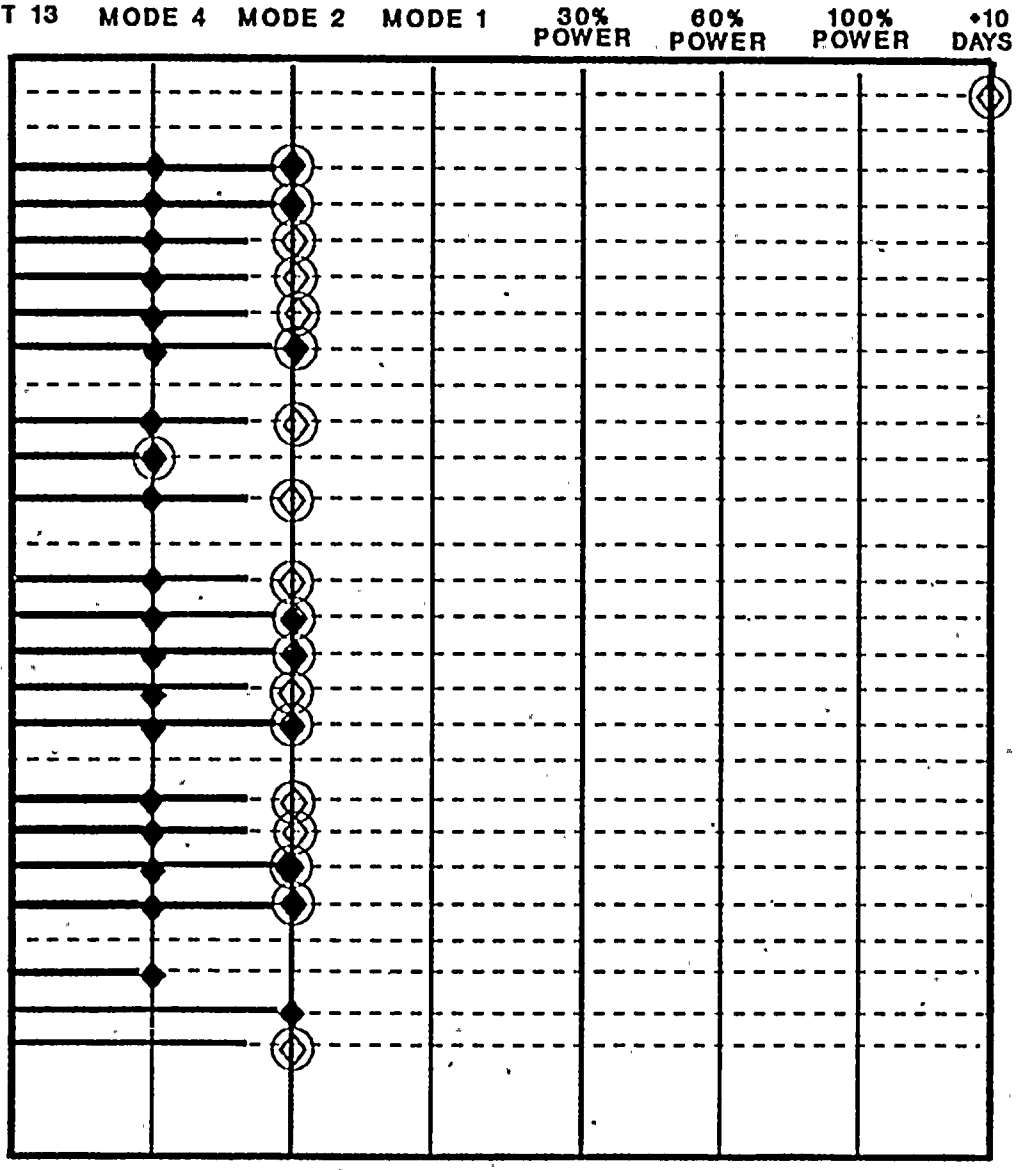
UNIT 3 RESTART PROGRAM



STATUS 12/01/89

UNIT 3 RESTART PROGRAM

ACTIVITY IN PROGRESS ◇ ACTIVITY SCHEDULE COMPLETE ◆ ACTIVITY COMPLETE ◈ MRC REVIEW



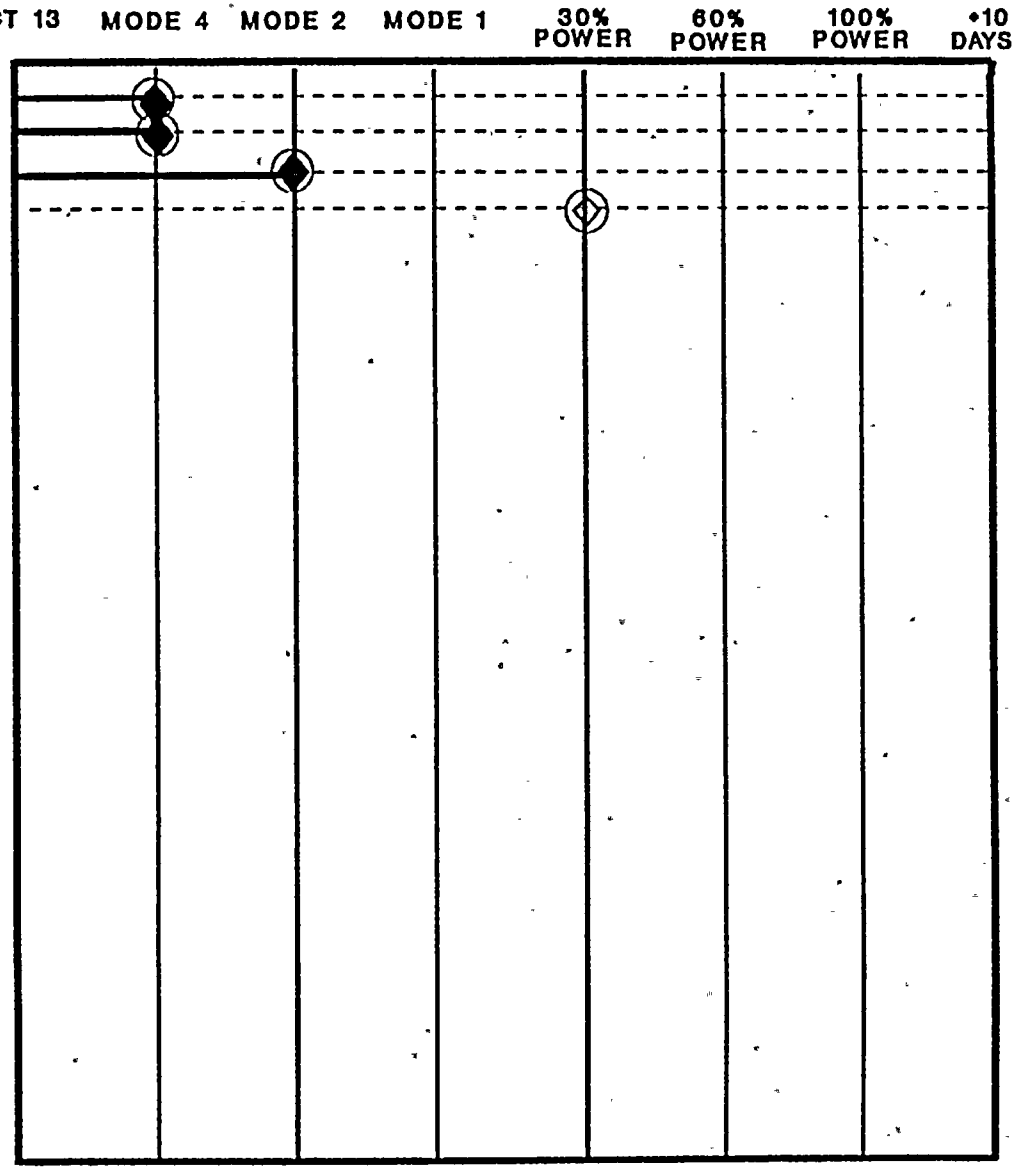
2. PLANT EQUIPMENT AND SUPPORT PERSONNEL
   - A. REVIEW REQUIRED ACTIONS FOR STARTUP
     1. RADIOLOGICAL CONTROLS
     2. CHEMISTRY CONTROLS
     3. TRAINING
     4. ENGINEERING
     5. MATERIAL CONDITION
     6. QUALITY ASSURANCE
   - B. WORKPLAN COMPLETION
     1. UNIT 3 RESTART LIST
     2. UNIT 2 POST RESTART
     3. SCHEDULED OUTAGE WORK
   - C. WORK BACKLOG REDUCTION
     1. ENGINEERING EVALUATION REQUEST
     2. CORRECTIVE MAINTENANCE
     3. PREVENTATIVE MAINTENANCE
     4. OPERATIONS PROCEDURE CHANGES
     5. IIR/PTR/SPEER
   - D. READINESS SELF ASSESSMENT
     1. FIRE PROTECTION
     2. CONTROL ROOM INST. STATUS
     3. INST RETURN TO SERVICE
     4. SECURITY
     5. MODIFICATION RELATED DOCUMENTS
        - A. CONTROL ROOM DOCUMENT AUDIT
        - B. VALIDATE KEY DRAWINGS
     6. TEST PROCEDURE & SCHEDULE AVAILABLE

STATUS 12/01/89

UNIT 3 RESTART PROGRAM

ACTIVITY IN PROGRESS ◇ ACTIVITY SCHEDULE COMPLETE ◆ ACTIVITY COMPLETE ⊚ MRC REVIEW

2. PLANT EQUIPMENT AND SUPPORT PERSONNEL
   7. M & TE PERFORMANCE
   8. VALVE/ELECTRICAL REVIEW
   9. RADMONITOR SYSTEM ACTION PLAN
   10. JOINT EED/NED SYSTEM WALKDOWN

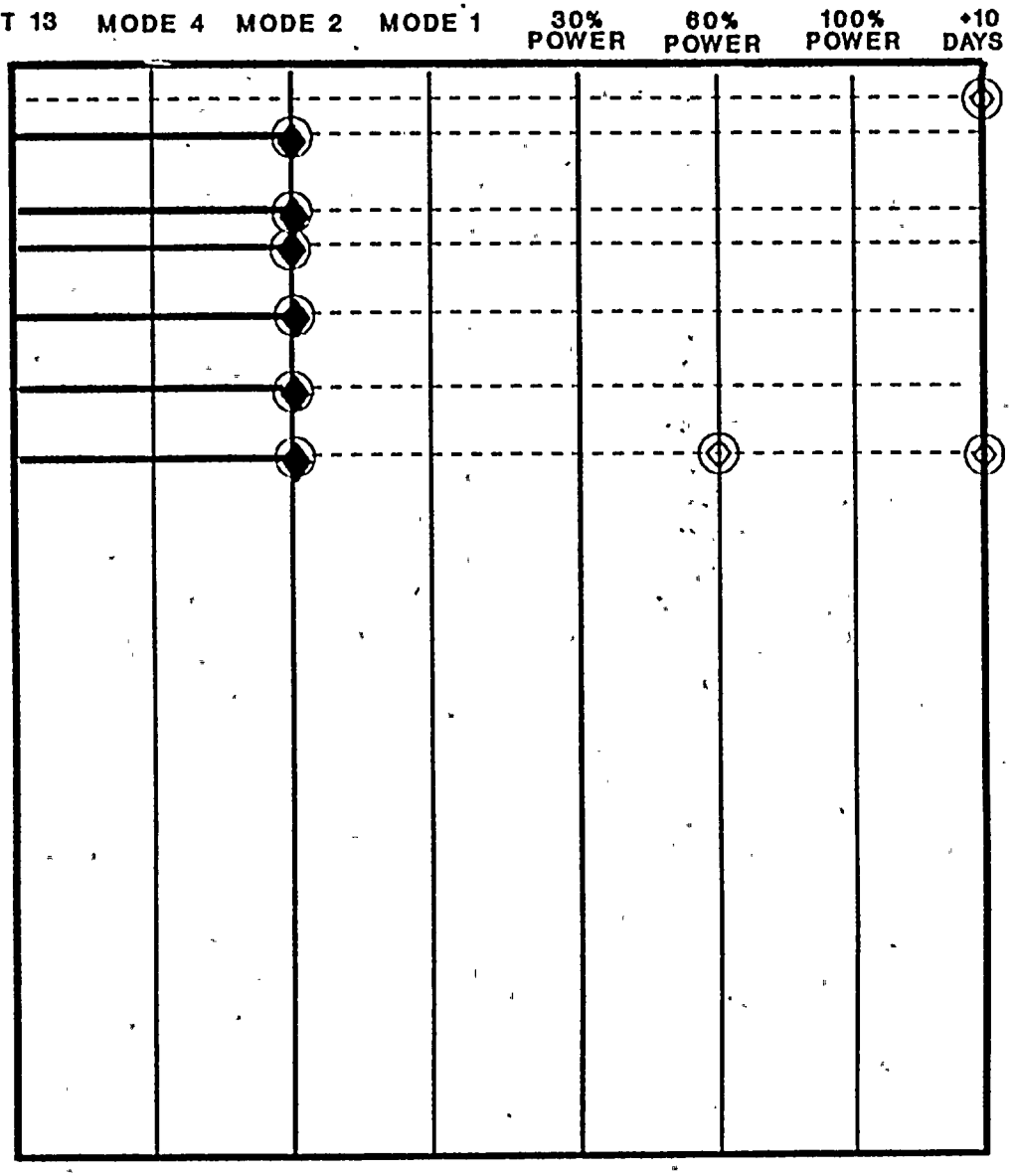


STATUS 12/01/89

UNIT 3 RESTART PROGRAM

ACTIVITY IN PROGRESS ◇ ACTIVITY SCHEDULE COMPLETE ◆ ACTIVITY COMPLETE ◈ MRC REVIEW

3. OPERATIONS PERSONNEL READINESS
   - A. TRAINING & QUALIFICATION
     1. REORIENTATION TIME ON OPERATING UNIT
     2. SHIFT MANNING
     3. REVIEW OF UNIT 2 LESSONS LEARNED
     4. SIMULATOR & CLASSROOM TRAINING
     5. BRIEFINGS FOR SPECIAL EVOLUTIONS
     6. USE OF PROCEDURES



STATUS 12/01/89

REPORT OF MANAGEMENT REVIEW COMMITTEE'S ACTIVITIES

* MRC RESULTS

  - INCREASED MANAGEMENT FOCUS

    EXISTING PROGRAMS EFFECTIVENESS

  - EXPANDED MANAGEMENT INVOLVEMENT

    DISCIPLINED MANAGEMENT REVIEW
    INTEGRATED MANAGEMENT REVIEW
    REINFORCED MANAGEMENT STANDARDS
    PROACTIVE MANAGEMENT TEAM

  - PROBLEMS IDENTIFIED AND ADDRESSED

  - EFFECTIVE TEAM BUILDING

ROLE OF QUALITY ASSURANCE

* INCREASED QUALITY ASSURANCE INVOLVEMENT

  - SPECIAL QUALITY ASSURANCE MONITORING TEAM
  - ENGINEERING EVALUATION REQUEST REVIEW EFFORT
  - UNIT 3 MODIFICATION WALKDOWN
  - PRE-RESTART COMMITMENT REVIEWS
  - POST-RESTART COMMITMENT REVIEWS
  - MANAGEMENT REVIEW COMMITTEE PARTICIPATION

UNIT 3 ENGINEERING WALKDOWNS

* PURPOSE

* JOINT EED/NED SYSTEM WALKDOWNS WERE PERFORMED ON 3 SYSTEMS

  - INPUT FROM UNIT MANAGEMENT ON SYSTEMS SELECTED

  - SYSTEMS CHOSEN WERE

    CHARGING AND VOLUME CONTROL (CH)

    AUXILIARY FEEDWATER (AF)

    CLASS 125 VDC BATTERY SYSTEM (PK)

  - A SENIOR CONSULTANT WAS RETAINED TO CRITIQUE THE WALKDOWN AND GIVE GUIDANCE TO ENGINEERING STAFF IN THE PERFORMANCE OF WALKDOWNS

* RESULTS OF THE WALKDOWNS

* FUTURE

  - CONTINUE WALKDOWNS

  - LESSONS LEARNED

ENGINEERING EVALUATION REQUEST REVIEW

* REVIEWED ALL ENGINEERING EVALUATION REQUESTS (EERs) ISSUED BUT NOT COMPLETED PRIOR TO OCTOBER 1,1989

* NEW NON-CONFORMANCE REPORTING (MNCR) AND EER PROGRAM PROCEDURE EFFECTIVE OCTOBER 1, 1989

* REVIEW BY TWO (2) MULTI-DISCIPLINED* TEAMS COMPRISED OF:

  - TEAM LEADER (ENGINEERING SUPERVISOR)
  - EED ENGINEER
  - NED ENGINEER
  - SRO (ALSO DEGREED ENGINEER)
  - QUALITY ASSURANCE ENGINEER

  (* ME, I&C AND EE)

NOTE: QUALITY ENGINEERING MANAGER PERFORMED AN INDEPENDENT CHECK OF APPROXIMATELY 100 EERS

ENGINEERING EVALUATION REQUEST REVIEW

* EER REVIEW CRITERIA

  - POTENTIAL MNCR
  - POTENTIAL TECHNICAL SPECIFICATION/UFSAR IMPACT
  - POTENTIAL TURBINE/REACTOR TRIP IMPACT
  - VALID EER

* THREE (3) PAGE CHECKLIST USED FOR EACH EER

* 2510 EERs REVIEWED

  127 POTENTIAL MNCRs

  33 POTENTIAL TECHNICAL SPECIFICATION/UFSAR IMPACT

  32 POTENTIAL TURBINE/REACTOR TRIP IMPACT

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  93 POTENTIAL RESTART IMPACT

ENGINEERING EVALUATION REQUEST REVIEW

* THOSE EERs WITH UNIT RESTART IMPACT POTENTIAL WERE REFERRED TO THE SYSTEM ENGINEER AND HIS SUPERVISION

* THESE EERs WERE EITHER:

  - DISPOSITIONED AND IMPLEMENTED, OR
  - CORRECTIVE ACTION TAKEN WITH EER REMAINING OPEN, OR
  - FURTHER REVIEWED AND DETERMINED NOT TO IMPACT RESTART

* NO ITEMS AFFECTING UNIT 3 RESTART WERE IDENTIFIED THAT WERE NOT ALREADY (BEING) RESOLVED

UNIT 1 STUCK FUEL ASSEMBLY

NOVEMBER 18 - 25, 1989

* SEQUENCE OF EVENTS
  - ATTEMPTED TO INSERT ASSEMBLY L-17 TO COMPLETE ROW L
  - REMOVED ASSEMBLY L-16
  - LOADED ASSEMBLIES M-17 AND L-17
  - ATTEMPTED TO INSERT ASSEMBLY L-16
  - REMOVED ASSEMBLY L-15
  - INSERTED ASSEMBLY L-16
  - FUEL ASSEMBLY L-15 INSERTED AND JAMMED

* EVALUATION OF CONDITION
  - LOWERED UNDERWATER VIDEO CAMERA
  - OBSERVED ASSEMBLY L-14 ON BOTTOM OF CORE BUT NOT ON LOCATING PINS
  - OBSERVED FULL LENGTH OF ASSEMBLY; APPEARED TO ONLY BE FRICTION HOLDING ASSEMBLY L-15
  - CONSULTED WITH COMBUSTION ENGINEERING (CE) AND PAR MANUFACTURING

UNIT 1 STUCK FUEL ASSEMBLY

- CE RECOMMENDED INCREASING OVERLOAD SETTING

- PAR CONCURRED WITH SYSTEM ENGINEER RECOMMENDATION TO USE MANUAL OPERATION OF HOIST TO INCREASE TENSION ON ASSEMBLY ABOVE OVERLOAD SETTING

- CE AND PAR AGREED TENSION COULD BE INCREASED TO 1937 POUNDS

* CORRECTIVE ACTION

- CONTACTED NRC TO DESCRIBE PROBLEM AND METHOD OF RETRIEVAL AND ADMINISTRATIVE CONTROLS

- DEVELOPED DETAILED PROCEDURE AND 10 CFR 50.59 EVALUATION

- USED MANUAL HOIST OPERATION TO FREE ASSEMBLY

- REMOVED FUEL ASSEMBLIES L-14, L-15, L-16, AND L-17, TO SPENT FUEL POOL FOR EXAMINATION. ASSEMBLIES K-14, K-15, K-16, AND K-17 WERE EXAMINED IN PLACE WITH A VIDEO CAMERA

- CE AND APS EVALUATING RESULTS OF INSPECTION

UNIT 1 STUCK FUEL ASSEMBLY

* ACTIONS TO PREVENT FURTHER OCCURRENCES

  - INCLUDE STEP(S) IN PROCEDURE TO VERIFY FUEL ASSEMBLY IS SEATED PROPERLY BEFORE PROCEEDING

  - CONSULT WITH INDUSTRY ABOUT OTHER GOOD PRACTICES FOR FUEL LOADING

POTENTIAL FUEL ASSEMBLY MISPOSITIONING UNIT 1

* SEQUENCE OF EVENTS - NOVEMBER 16, 1989

- DURING PREPARATION OF MATERIAL BALANCE AREA (MBA) SHEETS, A TYPOGRAPHICAL ERROR OCCURRED REGARDING THE SPENT FUEL POOL (SFP) LOCATION OF THE FUEL ASSEMBLY TO BE PLACED IN REACTOR LOCATION K-9.

- SUBSEQUENT REVIEWS OF THE MBA SHEETS DID NOT REVEAL THE TYPOGRAPHICAL ERROR

- DURING THE RELOAD, THE SPENT FUEL HANDLING OPERATOR REACHED THE STEP IN THE MBA SHEETS TO RETRIEVE THE FUEL ASSEMBLY IN SFP LOCATION P-38, HOWEVER, THE MBA SHEETS SPECIFIED TO RETRIEVE THE FUEL ASSEMBLY IN SFP LOCATION P-28

- AS THE FUEL ASSEMBLY WAS BEING LOWERED INTO CORE LOCATION K-9, THE REACTOR ENGINEER OVERSEEING THE EVOLUTION NOTICED A DISCREPANCY IN THE COLORING OF THE FUEL TAGS ON THE TAG BOARD

- THE EVOLUTION WAS HALTED, AND THE DISCREPANCY WAS INVESTIGATED

- THE TYPOGRAPHICAL ERROR WAS DETECTED, AND THE FUEL ASSEMBLY WAS TEMPORARILY STORED UNTIL THE APPROPRIATE TIME FOR ITS LOADING OCCURRED

POTENTIAL FUEL ASSEMBLY MISPOSITIONING UNIT 1

* CORRECTIVE ACTION

  - THE REMAINING MBA SHEETS WERE REVIEWED TO ENSURE THAT NO ADDITIONAL ERRORS EXISTED

  - REVIEW OF THE ADMINISTRATIVE CONTROLS AND A HUMAN PERFORMANCE EVALUATION ILLUSTRATED A WEAKNESS IN THE REVIEW AND LACK OF INDEPENDENT VERIFICATION OF THE MBA SHEETS

  - THE ADMINISTRATIVE CONTROLS WERE STRENGTHENED TO REQUIRE AN INDEPENDENT VERIFICATION OF THE MBA SHEETS AFTER THEY ARE PREPARED

* SEQUENCE OF EVENTS - NOVEMBER 29, 1989

  - AFTER COMPLETING THE MOVES REQUIRED FOR FUEL ASSEMBLY IN SFP LOCATION A-29, THE SPENT FUEL HANDLING MACHINE (SFHM) OPERATOR WENT TO THE NEXT STEP IN THE MBA SHEETS WHICH SPECIFIED MOVES FOR FUEL ASSEMBLY IN SFP LOCATION AA-29

  - DUE TO A PERSONNEL ERROR, THE SFHM OPERATOR INADVERTENTLY BELIEVED THAT THE MOVES HAD ALREADY BEEN COMPLETED AND PROCEEDED TO THE NEXT SET OF MBA SHEET MOVES FOR FUEL ASSEMBLY IN SFP LOCATION N-31

POTENTIAL FUEL ASSEMBLY MISPOSITIONING UNIT 1

- WHEN THE SFHM OPERATOR CONFIRMED THE SFP LOCATION (N-31) WITH THE REACTOR ENGINEERING REPRESENTATIVE IN THE CONTROL ROOM, THE REACTOR ENGINEER RECOGNIZED THAT THE INCORRECT FUEL ASSEMBLY HAD BEEN LOCATED, AND INFORMED THE SFHM OPERATOR OF THE ERROR

- THE FUEL ASSEMBLY WAS RESEATED IN THE SFP RACKS AND RELEASED, AND THE CORRECT FUEL ASSEMBLY (AA-29) WAS LOCATED AND GRAPPLED

* CORRECTIVE ACTION

- INSTRUCTIONS REGARDING FORMAL COMMUNICATIONS WERE INCORPORATED INTO THE REFUELING PROCEDURE

UNIT 2 TRIP
OCTOBER 31,1989

* SEQUENCE OF EVENTS

- 10/30/89 CHANNEL B & D EXPERIENCED A LOW EXCORE SIGNAL COMPARED TO CHANNELS A & C
- DECLARED BOTH CHANNELS INOPERABLE
- CHANNEL B LINEAR CALIBRATE SWITCH WAS EXERCISED AND SIGNAL RETURNED TO NORMAL
- CHANNEL D LINEAR CALIBRATE SWITCH WAS EXERCISED AND DID NOT RETURN TO NORMAL. PLACED CORE PROTECTION CALCULATOR (CPC) CHANNEL D TRIPS IN BYPASS
- WORK REQUEST WRITTEN TO TROUBLESHOOT EXCORE CHANNEL D
- 10/31/89 CHANNEL C EXPERIENCED INTERMITTENT REACTOR COOLANT PUMP SPEED SIGNAL CAUSING AN INTERMITTENT CPC TRIP
- PARALLEL PATH WORK ORDER GENERATED SINCE THE PLANT WAS IN A 1 OUT OF 2 TRIP CONDITION
- CHANNEL D TAKEN OUT OF BYPASS, CHANNEL C PLACED IN BYPASS IN ORDER TO ACCESS REASON FOR TRIP
- 10/31/89 CHANNEL B MIDDLE EXCORE DETECTOR OUTPUT GOES LOW TO RESPECTIVE CPC

UNIT 2 TRIP

* CHANNEL D EXCORE
  - TROUBLESHOOTING CHANNEL D EXCORE SHOWED DETECTOR INPUT TO THE PLANT PROTECTION SYSTEM CABINET TO HAVE AN OPEN CONNECTOR
  - CHANNEL D CONNECTOR PROBLEM WAS THE FIRST OCCURRENCE IN THIS APPLICATION

* RCP SPEED PROBES
  - REPLACED SPEED PROBE
  - RCP SPEED PROBE WAS DETERMINED TO HAVE AN ELECTRICAL CONNECTION PROBLEM
  - A PROCEDURE WILL BE IMPLEMENTED TO ENSURE THAT RCP SPEED PROBES ARE CHECKED FOR PROPER RESISTANCE AND SIGNAL CONDITIONING PRIOR TO RESTARTING THE UNITS FROM EACH REFUELING
  - UNIT 2 HAS CHECKED RCP SPEED PROBES AND THEIR CIRCUITRY. THIS REVIEW REVEALED SEVERAL MINOR GROUNDING AND CONNECTOR PROBLEMS WHICH WERE CORRECTED
  - UNIT 3 RCP PROBE CHECK IS IN PROGRESS

UNIT 2 TRIP

* LINEAR CALIBRATE SWITCHES

  - ROOT CAUSE ANALYSIS REVEALED SWITCH IS MARGINAL IN LOW CURRENT APPLICATIONS

  - INSTALLATION OF A T-MOD IN UNIT 2 TO JUMPER EXCORE SIGNAL AROUND THE LINEAR CALIBRATE SWITCHES

  - REPLACE THE LINEAR CALIBRATE SWITCH WITH NEW STYLE USING GOLD CONTACTS. (EER 89-SE-021)

  - COMBUSTION ENGINEERING WILL PERFORM AN INDEPENDENT EVALUATION OF THE PROBLEMS ASSOCIATED WITH THE INTERMITTENT LOSS OF LINEAR EXCORE POWER SIGNALS AND PROVIDE ANY ADDITIONAL SUGGESTIONS. (EER 89-SE-026)
    EXPECTED RESPONSE BY 1/9/90

UNIT 2 HEAT-UP

NOVEMBER 21, 1989

A. SEQUENCE OF EVENTS

1245	RCS AT 190° F; OPERATOR BYPASSES SHUTDOWN COOLING HEAT EXCHANGER
1315	RCS AT 208° F; HEAT-UP RATE = 36° F/HR.
1345	RCS AT 232° F; HEAT-UP RATE = 48° F/HR; OPERATOR ACTED TO STOP HEAT-UP.
1415	RCS AT 252° F; HEAT-UP RATE = 40° F/HR.
1420	HEAT-UP STOPPED AT 258° F; EER SUBMITTED FOR EVALUATION.

B. SYSTEM EVALUATION

AN EXISTING ANALYSIS FROM COMBUSTION ENGINEERING INDICATES THAT IF RCS TEMPERATURE >180° F, 60° F/HR HEAT-UP RATE DOES NOT ADVERSELY AFFECT PLANT COMPONENTS

UNIT 2 HEAT-UP

C. PROGRAM EVALUATION

- CONTROL ROOM SUPERVISOR (CRS) DID NOT EXERCISE ADEQUATE CONTROL AND COMMAND FUNCTION AS REQUIRED

- CONTROL ROOM OPERATORS DID NOT ADEQUATELY MONITOR HEAT-UP RATE OR ENSURE HEAT REMOVAL CAPABILITY AFTER ISOLATING SHUTDOWN COOLING SYSTEM

D. CORRECTIVE ACTION

- GUIDANCE ADDED TO PROCEDURE.

- BRIEFING HELD FOR ALL CREWS AND DISCUSSION HELD WITH CREWS BY UNIT MANAGEMENT REGARDING LESSONS LEARNED.

- UNIT MANAGEMENT HAS MONITORED CONTROL ROOM SUPERVISORS TO CONFIRM THEIR ABILITY TO EXERCISE ADEQUATE COMMAND AND CONTROL

AUXILIARY FEEDWATER VALVES

FUNCTION	FLOW CONTROL (MODULATING)
VALVE TYPE STACK (DRAG VALVE)	PRESSURE BREAKDOWN DISK
VALVE MANUFACTURER	CONTROL COMPONENTS, INC.
MOTOR OPERATORS	LIMITORQUE MODEL SMB 00
	2 DC OPERATORS/UNIT (TURBINE DRIVEN TRAIN)
	2 AC OPERATORS/UNIT (MOTOR DRIVEN TRAIN)

* RECENT PROBLEMS

- MOTOR OVERHEATING	AF30 - UNIT 3 AF33 - UNIT 2
- BENT VALVE STEMS	AF30 - UNIT 3 AF30 - UNIT 2 AF31 - UNIT 2
- PARTS SUBSTITUTION	AF30 - UNIT 3

AUXILIARY FEEDWATER VALVES

* MOTOR OVERHEATING

  - PROBABLE CAUSE

    TORQUE SWITCH DRIFT

  - CORRECTIVE ACTION

    VALVE STEM LUBRICATION, MODIFY MOTOR OPERATED VALVE (MOV)

* BENT VALVE STEMS

  - CAUSE

    MATERIAL (316 STAINLESS STEEL) IS MARGINAL FOR THE APPLICATION

  - CORRECTIVE ACTION

    VERIFY ALIGNMENT/REPLACE STEMS WITH STRONGER MATERIAL (410 STAINLESS, 17-4 PH STAINLESS)

AUXILIARY FEEDWATER VALVES

* PARTS SUBSTITUTION

  - CAUSE

    VALVE VENDOR SUPPLIES DIFFERENT DESIGNS UNDER SAME PART NUMBER

  - CORRECTIVE ACTION

    OPERABILITY VERIFIED BY TESTING; INVENTORY WAREHOUSE AND DEVELOP UNIQUE PARTS IDENTIFICATION METHOD