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Docket Nos. 50-334, 50-412

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Facility: Beaver Valley Power Station, Units 1 and 2

Inspection Period: November 15, 1998 through December 26, 1998

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EXECUTIVE SUMMARY

Beaver Valley Power Station, Units 1 & 2 NRC Inspection Report 50-334/98-10 & 50-412/98-10

This integrated inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a 6-week period of resident inspection; in addition, it includes the results of announced inspections by regional radiation protection, environmental monitoring, and fire protection specialists.

Operations

- On November 19, a containment entry team successfully stopped a secondary side leak of the "B" steam generator blowdown sample line. The troubleshooting plan was well developed and executed. The prejob and containment entry briefings were very detailed and included lessons learned from previous containment entries. (Section O1.2)
- Operators performed the primary component cooling water pump surveillance test accurately and in conformance with procedures. Due to high pump vibrations, the procedure could not be completed satisfactorily. Operations exited the procedure and restored the system correctly. (Section O2.2)
- Operators were alert and demonstrated questioning attitudes during routine plant activities. Careful scrutiny of planned work activities prior to authorization precluded conditions not permitted by technical specifications and potential reactor plant transients. Discrepancies were promptly acted on and entered into the station's corrective action program. (Section O4.1)

Maintenance

- Six routine maintenance activities were performed safely and in accordance with proper procedures. Peer checking, supervisor and contractor oversight, and communications with control room operators were good. Improvements were noted in minimization of Limiting Condition of Operation durations. (Section M1.1)
- Four surveillance tests were performed safely and in accordance with proper procedures. Good communication was observed. (Section M1.2)
- On two occasions, poor work planning, including inadequate identification of clearance boundaries, posed challenges to the operations staff. The planning deficiencies could have resulted in reactor plant transients and conditions not permitted by technical specifications. (Section O4.1)
- In response to a previous NRC violation, the licensee took comprehensive actions to ensure the appropriate level of detail was specified in maintenance work requests

Enclosure 1

and that controls were established for supplemental work instructions. Corrective actions were appropriately implemented and effective. Guidance for minor changes to maintenance work requests was being handled appropriately through the corrective action program. (Section M8.2)

Plant Support

- Overall, the licensee effectively maintained and implemented a radiological environmental monitoring program in accordance with regulatory requirements. (Section R1.1)
- The licensee effectively maintained and implemented a meteorological monitoring program in accordance with regulatory requirements. (Section R1.2)
- Audits were of sufficient depth to assess the implementation of the radiological environmental monitoring program and meteorological monitoring program. (Section R7.1)
- The environmental laboratory continued to implement effective Quality Assurance and Quality Control programs for the radiological environmental monitoring program samples, and continued to provide effective validation of analytical results. The programs were capable of ensuring independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample media. (Section R7.2)
- Housekeeping, control of combustible materials, and the material condition of the fire protection equipment installed in the plants was excellent. (Section F2.1)
- Fire barrier penetration seals in both units were in good condition. The fire barrier penetration seal reviewed conformed to the design configuration that had been tested for a 3-hour rating. (Section F2.2)
- The Quality Services Unit (QSU) has done an excellent job identifying areas for improvement in the fire protection program through their program audits. The QSU is ahead of the industry in that they started reviewing post-fire safe shutdown procedures and methodologies in 1995. (Section F7.1)
- Corrective actions for some fire protection program audit identified deficiencies (particularly safe shutdown analysis actions not being properly implemented in the post-fire shutdown procedures) had not been completed for a significant time period. The Nuclear Engineering Department review of post-fire shutdown procedures against the fire protection design basis had not been started at the end of the inspection, nor had the plan for conducting the review been finalized and approved. (Section F7.1)

Enclosure 1

- An electrical engineer identified a deficiency in the fire protection safe shutdown analysis which affected a boration flowpath. Corrective actions were appropriate. (Section F8.1)

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Report Details

Summary of Plant Status

Both units began this inspection period at 100 percent power and remained at full power through the period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

O1.2 Containment Leak Identification and Isolation (Unit 1)

a. Inspection Scope (71707)

In response to an increase in the containment sump pumpout rate on November 10, operations personnel, in conjunction with the system engineer, developed and implemented a troubleshooting plan. The inspectors reviewed the troubleshooting plan and containment entry procedure and attended the prejob and containment entry briefings to evaluate resolution of the leakage issue.

b. Observations and Findings

On November 10, operators noted an increase in the containment sump pumpout rate. The rate increased from approximately 1.5 gallons per hour (gph) to 8 gph. Sampling of the fluid indicated that it was secondary plant (non Reactor Coolant System) leakage based on low radioactivity, absence of boron, and pH level. Additionally, no inventory loss was experienced on the primary side. On November 17, after a few days delay to resolve containment airlock system problems, a containment entry was performed which identified leakage emanating from a bundle of sample lines in the "B" Steam Generator (SG) cubicle.

The system engineer and an Assistant Nuclear Shift Supervisor developed a troubleshooting plan to isolate the 3/8" "B" SG sample line. The inspectors reviewed the plan and determined that it was logical and well-controlled. The inspectors attended the prejob and containment entry briefing in the Radiological Operations Center (ROC). The briefing was performed in accordance with a new revision to Nuclear Power Division Administration Manual (NPDAP) 3.3, "Reactor Containment Entries", Rev. 8. The briefing was very detailed as the new procedural requirements and changes were reviewed. Personnel safety and radiation exposure minimization concepts were stressed in the briefing discussions. Lessons learned from previous containment entries included identification of low radiation dose

waiting zones and use of knee pads for personnel protection while maneuvering with a bio-pak around the reactor coolant pump motor.

On November 19, a containment entry team successfully stopped the "B" SG blowdown sample line leak by isolation of the blowdown line.

c. Conclusions

On November 19, a containment entry team successfully stopped a secondary side leak of the "B" steam generator blowdown sample line. The troubleshooting plan was well developed and executed. The prejob and containment entry briefings were very detailed and included lessons learned from previous containment entries.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature System Walkdowns (71707)

The inspectors walked down accessible portions of the following engineered safety feature systems:

- Unit 1 Quench Spray
- Unit 1 Recirculation Spray

Equipment operability, material condition, and housekeeping were acceptable. Several minor housekeeping items and material deficiencies were identified to the Nuclear Shift Supervisor and were corrected.

O2.2 Unit 2 Primary Component Cooling Water Pump "A" Test

a. Inspection Scope (61726)

The inspectors observed the surveillance test 2OST-15.1, "Primary Component Cooling Water Pump [2CCP*P21A] Test," Rev. 21 which was performed to establish operability of the "A" primary component cooling water pump. The inspectors focused on procedural compliance and pump performance assessment.

b. Observations and Findings

The pump (2CCP*21A) had been overhauled and a new pump curve needed to be established for pump performance monitoring. The operators performed the test accurately and in conformance with the procedure. The test was appropriately stopped by the condition monitoring supervisor due to high pump outboard bearing vibrations. The operators exited the procedure and restored the system alignment correctly. While observing the surveillance, the inspectors noted the order in which operators established initial conditions for the test resulted in about 1 hour of unnecessary pump unavailability, and increased Technical Specification (TS) Limiting Condition of Operation duration. The inspectors discussed this with the Assistant

Nuclear Shift Supervisor, who reviewed the issue with the operating crew to improve future performance.

c. Conclusions

Operators performed the primary component cooling water pump surveillance test accurately and in conformance with procedures. Due to high pump vibrations, the procedure could not be completed satisfactorily. Operations exited the procedure and restored the system correctly.

O4 Operator Knowledge and Performance

O4.1 Operator Awareness During Routine Activities

a. Inspection Scope (71707)

The inspectors observed operators during routine activities and interviewed operators concerning daily plant observations to determine whether operators were alert and properly evaluating plant conditions.

b. Observations and Findings

Control room operators were consistently aware of existing control room alarms, their cause, and corrective actions being taken. The deficiency tags posted in the auxiliary and turbine buildings indicated that four operators were properly scrutinizing material conditions and had a low threshold for identifying deficiencies. Unexpected indications or observations were properly questioned. The following examples demonstrate improved alertness and questioning attitudes by the operations staff. Upon identification, each issue was properly communicated to the Nuclear Shift Supervisor and a condition report was initiated for problem resolution and extent of condition reviews as appropriate.

- On November 30, while restoring the Unit 2 component cooling water pump 2CCP-P21A following maintenance, operators questioned whether the normal vent path configuration was adequate. Subsequent ultrasonic testing confirmed that a sizeable air void remained present following completion of the fill and vent procedure. The concern for potential water hammer conditions was properly resolved and a revised fill and vent procedure was developed for future use.
- On December 4, the Unit 2 auxiliary building tour operator observed that suction piping spool pieces for each of the three charging pumps were missing bolting wedges between the flange and nut. Over time, the resulting stress had bent several of the bolts as much as 15 degrees. The issue was properly evaluated by engineers, bolts were replaced, and wedges installed. Further inspections identified similar conditions on the auxiliary feedwater system, which were promptly corrected.

- While preparing to post a clearance on a set of main condenser steam jet air ejectors (SJAE) for nozzle replacement, Unit 2 operators identified that plant procedures did not address restoring the SJAE from this plant configuration. Work planning was deficient. This activity had the potential to cause a turbine trip if the SJAE were not properly restored. The job was halted until appropriate procedural guidance was developed.
- On December 22, the Unit 2 reactor operator observed that volume control tank (VCT) level was decreasing at a rate greater than expected, given the existing reactor coolant system leak rate. Operators confirmed that the chemist had begun his primary coolant sample purge prior to notifying the control room. The operator was alert in identifying this small change in VCT level.
- On December 23, while preparing to post a clearance on the control room emergency bottled air pressurization system (CREBAPS), operators identified that a clearance isolation boundary valve (1VS-19) leaked by. Although a deficiency tag was hung, indicating the degraded condition, the work package relied on this valve for isolation. If the planned work activity had been performed using this clearance, a second set of CREBAPS air bottles would have depressurized resulting in an unplanned dual unit technical specification (TS) 3.0.3 entry. The job was halted and the work package was revised.

c. Conclusions

Operators were alert and demonstrated questioning attitudes during routine plant activities. On two occasions, poor work planning, including inadequate identification of clearance boundaries, posed challenges to the operations staff. Careful scrutiny of planned work activities prior to authorization precluded conditions not permitted by technical specifications and potential reactor plant transients. Discrepancies were promptly acted on and entered into the station's corrective action program.

O8 Miscellaneous Operations Issues (90712)

O8.1 (Closed) Licensee Event Report (LER) 50-334/98-28: Automatic Reactor Trip On 'A' Steam Generator Low Level Coincident With Steam Flow/Feed Flow Mismatch Signal From Manually Tripped Transmitter Bistables of F-MS-475

This event was fully documented in NRC Inspection Report 50-334(412)/98-04. The LER accurately described the event causal factors and corrective actions. Through inoffice review, the inspectors confirmed that the corrective actions were appropriate and were complete.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Routine Maintenance Observations

a. Inspection Scope (62707)

The inspectors observed selected maintenance activities on important systems and components. The maintenance work requests (MWRs), maintenance surveillance procedures (MSPs) and maintenance planning scheduling (MPS) activities observed and reviewed are listed below.

- 1MSP-24.01-I "1FWS-L474, Loop 1 Narrow Range Steam Generator Water Level Channel I Test," Rev. 1
- MWR 075495 Leak Repair of FW-302 (Unit 1)
- MPS 074096 Service Water Pump Strainer Preventive Maintenance
- 2MSP-37.04-E "2P 480 Volt Emergency Bus Degraded Voltage Relays 27-RP200AB and 27-RP200BC 28 Day Functional Test," Rev. 11
- 2MSP-6.39-I "Reactor Coolant Temperature Loop 2RCS-T422 Delta T-Tavg," Rev. 9
- MWR 075981 Check Calibration of T-hot & T-cold NRA Cards from the Terminal Blocks instead of the Test Jacks (Unit 2)

b. Observations and Findings

The inspectors determined that the work performed under these activities was professional and thorough. On the steam generator water level channel test, the inspectors observed good peer checking by knowledgeable and skilled technicians. On the leak repair work, the job was performed with good safety emphasis and contractor control and oversight. The Project Coordinator made a good decision to stop the work and contact engineering when the required clearance between the leak repair clamp and the piping support was not achieved. The service water pump strainer preventive maintenance was completed ahead of schedule thereby minimizing the limiting condition of operation (LCO) duration. The degraded voltage relay test was conducted properly in accordance with procedures. The inspectors observed good supervisor oversight during maintenance work associated with the reactor coolant temperature loop.

c. Conclusions

Routine maintenance activities were performed safely and in accordance with proper procedures. Peer checking, supervisor and contractor oversight, and communications with control room operators were good. Improvements were noted in minimization of LCO durations.

M1.2 Routine Surveillance Observations

a. Inspection Scope (61726)

The inspectors observed selected surveillance tests. Operating surveillance tests (OSTs) reviewed and observed by the inspectors are listed below.

- 1OST-36.1 "Diesel Generator No. 1 Monthly Test," Rev. 20
- 2OST-7.6 "Centrifugal Charging Pump [2CHS*P21C]," Rev. 13
- 2OST-13.2 "Quench Spray Pump [2QSS*P21B] Test," Rev. 12

b. Observations and Findings

The surveillance tests were performed safely and in accordance with proper procedures. Minor deficiencies were identified and entered in the maintenance work process. The Unit 1 diesel generator test was performed professionally and thoroughly. When a minor fuel oil leak developed on the fuel oil strainer, the Assistant Nuclear Shift Supervisor promptly inspected it and contacted maintenance. The inspectors observed good communication between the control room operator and the nuclear operator in the diesel cubicle.

c. Conclusions

Surveillance tests were performed safely and in accordance with proper procedures. Good communication was observed.

M8 **Miscellaneous Maintenance Issues**

M8.1 (Closed) Violation 50-334(412)/97-05-05: Inadequate Control of Troubleshooting Activities Leads to ESF Actuation.

a. Inspection Scope (92902)

The inspectors reviewed the corrective actions to the violation which included a review of the new governing procedure for troubleshooting, NPDAP 8.34, "Control of Troubleshooting Activities," Rev. 1, the maintenance department self assessment, and the quality assurance assessment of troubleshooting. The inspectors examined over 70 MWRs to determine if troubleshooting was appropriately identified and controlled. Fourteen troubleshooting plans were evaluated for risk categorization, definition of boundaries, and level of reviews. Various maintenance personnel were interviewed.

b. Observations and Findings

Maintenance personnel developed a troubleshooting procedure in response to the violation. The inspectors reviewed the procedure and observed that the procedure provided: 1) a method for categorization of risk; 2) appropriate supervisor/management approval requirements; 3) a good general method for

developing the troubleshooting plan; 4) emphasis on communication and especially information being transferred to the operating crew; 5) pre-job briefing requirements; and 6) definition of troubleshooting boundaries.

The inspectors reviewed troubleshooting plans for fourteen MWRs. The troubleshooting plans were categorized for risk appropriately, boundaries were well defined, and the work stayed within the evaluated boundaries. The plans were properly reviewed by the appropriate level of management. Based on the procedure revision and troubleshooting plan development, the inspectors determined the causes of the violation were comprehensively addressed.

The maintenance self assessment and the quality assurance audit were detailed and self critical. Several issues were identified and corrected. One common problem was that troubleshooting was not properly identified and implemented using the troubleshooting procedure in some maintenance activities. The inspectors independent review of 70 MWRs also identified that the troubleshooting procedure was not consistently applied to lower risk significant maintenance activities. Corrective actions to the self assessment and quality assurance audit finding did not address the deficiency. The inspectors determined troubleshooting was not well defined in the maintenance procedures.

The determination of whether an item is troubleshooting is based on the work planner's assessment. In discussions with planners, the inspectors were informed that no guidance exists for defining troubleshooting. The safety significance of the items identified, for which a troubleshooting plan was not used, was minimal. The inspectors discussed the issue of poor corrective actions to the identified finding and the lack of a definition for troubleshooting with maintenance personnel. The work planning manager stated that a clear definition of troubleshooting would be developed and communicated to work planners and the maintenance supervisors. This action was being tracked under the maintenance department commitment tracking system.

c. Conclusions

The corrective actions in response to the violation on control of troubleshooting, were effective in addressing the root cause of the violation. Troubleshooting activities in the field were properly controlled. Continued improvements were needed in troubleshooting plan use for lower risk significant items.

M8.2 (Closed) Violation 50-412/97-11-08: Inadequate Work Instructions and Improper Control of Supplemental Work Instructions in Maintenance Work Request (MWR)

a. Inspection Scope

The inspectors reviewed the response to the violation concentrating on the corrective actions. The inspectors verified that the corrective actions were completed by reviewing the procedure changes that were implemented, the training that was provided to the planners including a review of the lesson plan, and the

effectiveness review and self-assessment that were performed. The inspectors interviewed a planner, a lead planner, and the Director of Work Planning to validate the corrective actions. Fifty safety related MWR's were also reviewed for technical content and consistency.

b. Observations and Findings

Inadequate repair activities on the Unit 2 station battery 2-1 resulted in a high impedance location within the battery which had the potential to cause significant battery damage during a full capacity discharge test on January 31, 1997. The reasons for the inadequate repair activities were determined to be the lack of a clear standard for work package content and inadequate control of supplemental work instructions. Additionally, the licensee performed work outside the scope of the work instructions.

Revisions to the Work Planner Desktop Guide, Nuclear Power Department Administrative Procedure (NPDAP) 7.5, "Processing a Maintenance Work Request," Rev. 11, and Station Battery Corrective Maintenance Procedure "1/2CMP-39BYS/DC-BATTERY-1E," Rev.5 were reviewed by the inspectors. The battery procedure changes incorporated very detailed controls for cell removal and installation. The Work Planner Desktop Guide added comprehensive information delineating the level of detail in work packages and implemented a lead planner review of planned MWR's.

NPDAP 7.5 added guidance for changing work instructions in the field and the use of supplemental work instructions. The inspectors noted that Work Group Supervisors were authorized to make "minor changes" to written work instructions in the field. However, no guidance existed for defining "minor changes." Unrelated to this violation, condition report (CR) 982083 had been initiated on November 17 to address recent discrepancies between MWR instructions and actual work performed in the field. The Director of Work Planning and Director of Instrumentation and Control informed the inspectors that the corrective actions from CR 982083 will include guidance on minor changes to MWR's.

Additional corrective actions included comprehensive training for the planners which provided sufficient instruction for delineating the required level of detail in MWR planning. The inspectors' interviews with the planners validated their understanding of the new requirements. The inspectors reviewed 50 completed safety related MWR's and did not identify any deficiencies associated with the level of detail or supplemental work instructions. The licensee performed a comprehensive self-assessment which identified 27 recommendations for improvements in maintenance pre-planning and implementation. These recommendations are captured in the maintenance commitment tracking system and are currently under management review. The effectiveness review identified a deficiency in the work package feedback forms. The feedback forms are being revised and another effectiveness review has been scheduled to re-evaluate the data next year.

c. Conclusions

In response to an NRC violation, the licensee took comprehensive actions to ensure that the appropriate level of detail was specified in maintenance work requests and that controls were established for supplemental work instructions. Corrective actions were appropriately implemented and effective. Guidance for minor changes to maintenance work requests was being handled appropriately through the corrective action program.

III. Engineering

E8 Miscellaneous Engineering Issues (37551, 92903)

E8.1 (Closed) Violation EA 50-412/97-517(01013): Failure to Prevent Gas Binding of High Head Safety Injection Pumps

a. Inspection Scope (92903)

The inspectors reviewed the response to the violation, examined a sample of corrective actions, and evaluated the long term effectiveness of the corrective actions.

b. Observations and Findings

Between 1988 and September 12, 1997, Unit 1 and 2 experienced repeated gas accumulation and gas binding of the high head safety injection (HHSI) pumps. The failure to take adequate corrective actions resulted in the violation issued on January 6, 1998. The licensee determined the root causes to be design inadequacies and inadequate corrective actions including inadequate questioning attitudes toward past events. The corrective actions taken included: 1) the formation of a multi-discipline analysis team (MDAT) to evaluate the issue and perform an extent of condition review; 2) the installation of twenty-two stage flow restricting orifices in the Unit 1 and 2 HHSI pump minimum flow recirculation lines; 3) establishment of an acceptable gas void fraction limit; 4) establishment of procedures for venting and monitoring gas accumulation in the HHSI lines; 5) formalization of the MDAT and a critique process; and 6) safety culture training for operations and maintenance personnel in addition to engineering personnel.

The corrective actions were comprehensive and addressed the root causes of the violation. The new restricting orifices have eliminated the most significant source of hydrogen gas in the Unit 1 and 2 HHSI systems as evidenced by periodic ultrasonic testing. The procedures for monitoring and venting gas accumulation are appropriately controlled to ensure proper operability evaluation of the pumps (see NRC Inspection Report 50-334(412)/98-03 for more information on venting practices). The MDAT and critique process were formalized as NPDAP 5.10, "Conduct of Critiques and Multi-Discipline Analysis Team Investigations." The inspectors have observed successful implementation of this procedure during the

Unit 2 quench spray water hammer event (see NRC Inspection Report 50-334(412)/98-03). The safety culture training assisted in improving the questioning attitude of engineering personnel. Training for maintenance and operation personnel continues. Overall, the corrective actions have been effective.

c. Conclusions

Corrective actions in response to the violation on failure to prevent gas binding of the high head safety injection pumps were comprehensive and have successfully eliminated the most significant source of hydrogen gas in the system.

E8.2 (Closed) Violation 50-334/98-80-02: Failure To Promptly Correct Excessive Leakage Of Residual Heat Valve MOV-RH-758.

The inspectors identified in NRC Inspection Report 98-80 that excessive seat leakage of the Residual Heat (RH) flow control valve MOV-RH-758 was not corrected in a timely manner. In response, the licensee performed an event critique which reviewed the problem history and initiated troubleshooting to determine if adjustment of the actuator position could reduce the seat leakage to an acceptable limit. The test resulted in no improvement in the valve seat leakage. The licensee has decided to replace the valve during the upcoming Unit 1 refueling outage, expected to occur in March, 2000. The inspectors discussed the valve replacement planning with outage management and the RH system engineer and determined that it was adequate. An extent of condition review was also performed to identify other cases where non-throttle type valves were being used in a throttle-type capacity in the plant. The inspectors determined that the extent of condition review was technically sound.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

R1.1 Implementation of the Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope (84750)

The following areas of the REMP were assessed and reviewed: (1) selected sampling locations and stations; (2) selected REMP procedures; (3) 1998 environmental sample analytical results; (4) Land Use Census results; and (5) the Beaver Valley Power Station 1997 Annual REMP report.

b. Observations and Findings

Several environmental monitoring stations were examined. The air samplers, water compositors, and thermoluminescent dosimeters (TLDs) were placed at the locations designated in the Offsite Dose Calculation Manual (ODCM). The air sampling equipment and water compositors were operable during 1998, as evidenced by the

sample logs and sample analysis results. Milk and food products were collected from the locations specified in the ODCM.

The analytical results of the environmental samples were reviewed from January to October, 1998. Analyses were performed by the licensee's Environmental Radiological Laboratory. The data indicate that the environmental samples were collected and analyzed at the frequencies required in the ODCM. The licensee met the environmental lower limits of detection (LLD).

The annual Land Use Census was performed in 1997 and 1998, during the growing season, as required by the ODCM. A thorough land use survey, including a resident, garden, and milk animal census was performed. No significant changes were made to the REMP program as a result of the census.

The 1997 Annual Radiological Environmental Monitoring Report included results of the environmental monitoring program, program changes, land use census, and interlaboratory comparison program, as required by TS. The reports provided a comprehensive summary of the results of the REMP around the site and met TS reporting requirements.

c. Conclusion

Overall, the licensee effectively maintained and implemented a radiological environmental monitoring program in accordance with regulatory requirements.

R1.2 Meteorological Monitoring Program (MMP)

a. Inspection Scope (84750)

The following areas of the MMP were assessed and reviewed: (1) channel calibration procedures and results; (2) site operations logs and condition reports; (3) channel checks and functional checks; and (4) maintenance records.

b. Observations and Findings

The calibration results were within the acceptance criteria. The calibrations, channel checks, and functional checks were conducted as required by TS. The meteorological instrumentation on the tower and the readout devices located in the control room, the technical support center, and equipment room at the base of the tower were operable. The licensee completed a modification to upgrade the transmitters (wind speed and direction sensors, and the temperature sensors) and the recorders.

c. Conclusion

The licensee effectively maintained and implemented a meteorological monitoring program in accordance with regulatory requirements.

R7 Quality Assurance in Radiological Protection and Chemistry Activities**R7.1 Quality Assurance Audit Program****a. Inspection Scope (84750)**

The licensee's audit of the REMP and MMP was evaluated through a review of the quality assurance audit reports for 1997 and 1998.

b. Observations and Conclusions

The audits were detailed in scope and effectively assessed the REMP and MMP. Performance of the audits was good, in that specific REMP and MMP activities were directly observed and timely feedback regarding performance of the activity was provided. Condition reports, observations, and recommendations were appropriate to provide guidance and ensure quality of the program. Responses were thoroughly investigated and timely. All 1997 audit condition reports were tracked and closed.

The 1998 audit condition reports were recently submitted into the corrective action process. One audit finding identified a potential discrepancy between the methods used to perform wind speed sensor channel calibrations and the TS 3.3.3.4 surveillance requirement. The inspectors verified that this issue had been entered into the corrective action process (CR 98-2144) with an appropriate schedule for resolution.

c. Conclusion

The audits provided an effective assessment of the REMP and MMP.

R7.2 Quality Assurance of Analytical Measurements**a. Inspection Scope (84750)**

The quality assurance/quality control programs of the contract laboratory for 1998, including the Interlaboratory Comparison (cross-check) Program were reviewed.

b. Observations and Findings

The quality assurance program consisted of measurements of blind duplicate, spike, and split samples. The laboratory continued to participate in the EPA Cross-Check Program and the Interlaboratory Comparison Program provided by a vendor laboratory (Analytics, Inc.). The results of these programs were within the established acceptance criteria.

c. Conclusion

The environmental laboratory continued to implement effective Quality Assurance and Quality Control programs for the radiological environmental monitoring program

samples, and continued to provide effective validation of analytical results. The programs were capable of ensuring independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample media.

R8 Miscellaneous RP&C Issues

R8.1 (Closed) Violation 50-334/97-08-05: Failure to Establish Adequate Radiation Monitoring System (RMS) Calibration Procedures

Licensee procedural guidance did not contain adequate guidance for establishing optimum RMS operating high voltage. The inspectors held a October 30, 1998 telephone discussion with the Health Physics Protection Manager. Inspection activities were conducted in the Region I office. The following licensee procedures were reviewed.

- Radiological Instrument Procedure 2.29, "RMS Detector Response," Rev. 2
- Radiological Instrument Procedure 2.35, "RMS/DRMS Plateau Evaluations," Rev. 0

Review of the procedures indicated that specific guidance had been included to established optimum operating high voltage for RMS during calibrations. NRC Inspection Report 50-334(412)/98-02 described other corrective actions to address this violation. In conclusion, the corrective actions appropriately addressed this issue.

R8.2 (Closed) Inspector Follow-up Item (IFI) 50-334/97-08-06

During NRC Inspection 50-334/97-08, the inspector questioned the licensee as to whether they could provide any information pertaining to new/refurbished detector failures so as to explore whether there were any 10 CFR 21 implications with respect to Violation 50-334/97-08-05. During the October 30, 1998 telephone call, the Health Physics Manager informed the inspector that there was no readily retrievable data pertaining to new or refurbished detector failures. No issue pertaining to 10 CFR 21 was identified because the suspect RMS was not used in a safety-related application.

F2 Status of Fire Protection Facilities and Equipment

F2.1 Facility Tours

a. Inspection Scope (64704)

The inspectors toured the plant, in concert with the respective fire protection system engineers, to evaluate housekeeping, combustible material control, and the material condition of the installed fire protection equipment.

b. Observations and Findings

During tours of the facility, the inspectors noted that there were no accumulations of transient combustible materials outside of the designated storage cages. The inspectors also noted that the Unit 1 storage cages were located in areas protected by automatic suppression systems.

Sprinkler system discharge heads were unobstructed, with one exception. The inspectors found one damaged sprinkler head, and one obstructed sprinkler head, above the catwalk on the south side of the lower level of the Unit 1 turbine building. There were no combustible materials, either transient or permanently installed, in the area. The Unit 1 fire protection system engineer made note of the deficiency for correction at the next opportunity. Deluge valves and sprinkler alarm check valves were in good condition and appeared well-maintained.

Since the last inspection, in August 1996, the plant has located and repaired a number of leaks in the fire main system. The fire protection system engineer informed the inspectors that this has resulted in improved performance of the hydro pneumatic tank which maintains system pressure. The facility is planning to proceed with a modification to provide a cross-tie between the filtered water system and the fire main system in the Unit 1 turbine building to provide a backup means of pressure maintenance for the fire mains. The fire pumps, hydro pneumatic tank, keepfill pump, and compressor in the intake structure were in a good state of preservation.

c. Conclusions

Housekeeping, control of combustible materials, and the material condition of the fire protection equipment in the plants were excellent.

F2.2 Fire Barrier Penetration Seals

a. Inspection Scope (64704)

During facility tours, the inspectors observed the condition of the penetration seals in various fire barriers in the plants. One seal was selected, at random, for detailed review.

b. Observations and Findings

The inspectors did not observe any deteriorated fire barrier penetration seals during the plant tours. A penetration seal in the Unit 1 West Cable Vault was selected for detailed review.

Penetration seal WCV-735-114 is a silicone foam seal of an empty sleeve through the wall. The seal contains approximately two inches depth of ceramic fiber damming on both sides. This results in approximately a ten inch depth of foam in

the penetration. The seal is shown on Drawing HK-119-33-CV1, Rev. 1 (DLC Doc. File No. 8700-1.35-171) as a four inch sleeve sealed with silicone foam.

Promatec Drawing B-465, Sheet 1 of 2, shows this type of seal as a Typical ES-1, using a ten inch depth of foam and one inch of damming. Promatec Drawing B-465, Sheet 2 of 2 shows ES-1 seals as 3 hour fire rated, and lists an American Nuclear Insurers (ANI) Index 3 reference. The inspectors confirmed that the installed seal is smaller than the maximum area qualified for fire exposure. Promatec document, "American Nuclear Insurers (ANI) Acceptances," contains acceptance forms for fire endurance tests for penetration seals and protective envelopes. Index #3, CTP-1001A, shows that the seal design successfully withstood a 3-hour fire exposure and subsequent hose test on May 20, 1986.

c. Conclusions

The fire barrier penetration seals in both units were in good condition. The fire barrier penetration seal reviewed conformed to the design configuration that had been tested for a 3-hour fire rating.

F7 Quality Assurance in Fire Protection Activities

F7.1 Fire Protection Program Audits

a. Inspection Scope (64704)

The inspectors reviewed audits of the fire protection program conducted since the last inspection, and condition reports relating to discrepancies between the post-fire shutdown procedures and safe shutdown reports and analyses.

b. Observations and Findings

Since the last inspection, conducted in August of 1996, Duquesne Light Company (DLC) has performed two audits of the Fire Protection Program. The audits were performed in accordance with Section IV.O, "Program Review," of Nuclear Power Division Administrative Procedure (NPDAP) 3.5, "Fire Protection." The current revision of NPDAP 3.5 is Rev. 7, with an effective date of July 1, 1998.

The 1997 program audit, BV-C-97-06, resulted in the issuance of eleven condition reports (CRs), including the identification of recurrent deficiencies in post-fire safe shutdown procedures. The auditors concluded that overall, regulatory requirements had been met, and implementation of the Fire Protection Program had been effective. The audit report contained several recommendations, including the development of a listing of the National Fire Protection Association (NFPA) code commitments and deviations for the fire suppression and detection systems installed at the station.

The 1998 program audit, BV-C-98-09, resulted in the issuance of eighteen CRs. The audit report also contained six recommendations, and identified two program

strengths. The audit findings were significant in that they found that the post-fire shutdown procedures were not adequate. The auditors concluded that overall, the Fire Protection Program at the Beaver Valley Power Station is not fully effective. The audit report stated "This is the fourth consecutive QSU audit that identified discrepancies concerning the procedures used for a fire induced shutdown..."

The inspectors discussed the history of the post-fire shutdown procedure audit findings with the Quality Services Unit (QSU) auditor who led the audits. The deficiency reports (DRs) and problem reports (PRs) which resulted from the 1995 and 1996 audits documented instances where the post-fire operating procedures did not properly implement required actions developed in the safe shutdown analysis. While a specific deficiency was not identified more than once, each audit found similar problems, that is, post-fire shutdown procedures did not properly implement actions specified in the safe shutdown analyses. The 1996 audit resulted in two DRs requiring Nuclear Engineering Department (NED) to review the post-fire operating procedures. These two DRs, QSAS-96-0101 and QSAS-96-0167 remained open at the time of this inspection. The PR which assigns the actions to NED is 2-96-789. The inspectors verified that the due dates for the PR had been extended in accordance with the requirements of the corrective action program. The required reviews were enveloped by a fire protection program review by NED, which was planned for the first quarter of 1999. Although the plan for the review had not been approved or issued at the time of the inspection, a draft of the plan attached to a memorandum from the Vice President, dated November 23, 1998, appeared to have appropriate scope and depth of review to resolve the discrepancies.

The adequacy of the Engineering assessment of the Fire Protection Program to resolve the issues resulting from the 1996 program audit will be reviewed in a future inspection. (IFI 50-334(412)/98-10-01)

c. Conclusions

The Quality Services Unit (QSU) has done an excellent job identifying areas for improvement in the fire protection program through their program audits. The QSU is ahead of the industry in that they started reviewing post-fire safe shutdown procedures and methodologies in 1995. Corrective actions for some of the identified deficiencies (particularly safe shutdown analysis actions not being properly implemented in the post-fire shutdown procedures) had not been completed for a significant time period. The Nuclear Engineering Department review of post-fire shutdown procedures against the fire protection design basis had not been started at the end of the inspection, nor had the plan for conducting the review been finalized and approved.

F8 Miscellaneous Fire Protection Issues

F8.1 (Closed) LER 50-412/98-05: Inadequate Fire Protection Safe Shutdown Analysis for Boric Acid to Boric Acid Blender Valve, 2CHS*FCV113A.

a. Inspection Scope (92700)

The inspectors performed an onsite review of the LER. The inspectors interviewed engineers, examined a sample of corrective actions, and reviewed the operability determinations.

b. Observations and Findings

On April 2, 1998, during a review of a proposed modification, an electrical engineer identified that the existing fire protection safe shutdown analysis for the boric acid storage tank to the boric acid blender supply valve, 2CHS*FCV113A, was deficient. Due to errors in the valve control circuit analysis, boration via the boric acid tanks specified in the analysis and the plant operating manual would be unavailable for two fire areas (Cable Vault and Rod Control Area Cable Tunnel or the Primary Auxiliary Building Elevation 773'6"). The errors resulted from oversight of the support cables and equipment for 2CHS*FCV113A while developing the list of electrical cables in specific designated fire areas for the fire protection safe shutdown analysis.

During this report period, the inspectors reviewed station drawings and independently verified that although the boric acid tanks would be unavailable, the refueling water storage tank would remain available as a boration flow path. Using existing procedures, the plant could still achieve cold shutdown conditions within 72 hours as specified in the safe shutdown analysis.

The inspectors determined that the engineer demonstrated a questioning attitude in identifying the deficiency. Major corrective actions included a modification of the circuit to meet existing design requirements and an extent of condition review. The engineer examined safe shutdown components and cables for one boration flow path during the extent of condition review. The modification and extent of condition review were appropriate to address the deficiency.

Section 2.F of the Unit 2 Facility Operating License No. NPF-73 requires that DLC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Updated Final Safety Analysis Report (UFSAR). The fire protection safe shutdown analysis and UFSAR describe the equipment operability following fires in plant areas including the available boration flow paths. Contrary to the above, due to design errors in the valve control circuit, 2CHS*FCV113A would not be available during fires in the Cable Vault and Rod Control Area Cable Tunnel or the Primary Auxiliary Building Elevation 773'6". This non-repetitive, licensee-identified, and corrected violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV 50-412/98-10-02).

c. Conclusions

An electrical engineer identified a deficiency in the fire protection safe shutdown analysis which affected a boration flowpath. Corrective actions were appropriate.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on December 31, 1998. The licensee acknowledged the findings presented. The licensee did not indicate that any of the information presented at the exit meeting was proprietary.

X2 Duquesne Light Company Organization Changes

Effective December 9, 1998, Mr. Mark P. Pearson assumed the duties of Manager, Quality Services Unit.

X3 NRC Organization Changes

Effective December 14, 1998, Mr. Dan S. Collins assumed the duties of NRC Project Manager for Beaver Valley Power Station, Division of Nuclear Reactor Regulation.

X4 NRC Management Meetings

On November 16, 1998, Mr. R. Crlenjak, NRC Region I, Deputy Director, Division of Reactor Projects, and other members of the Beaver Valley Oversight Panel, met with Mr. J. Cross and other DLC representatives at Beaver Valley Power Station. The NRC presented the exit results for NRC Inspection 50-334(412)/98-09 and DLC personnel presented a self assessment of Beaver Valley Units 1A&2 Restart Plan Performance. A copy of the slides presented by DLC at this meeting is attached as enclosure (2).

PARTIAL LIST OF PERSONS CONTACTED

Duquesne Light Company

J. Cross, President, Generation Group
 R. Brandt, Vice President, Nuclear Operations Support Group
 S. Jain, Vice President, Nuclear Services
 M. Pearson, Manager, Quality Services Unit
 J. Macdonald, Manager, System & Performance Engineering
 K. Beatty, General Manager, Nuclear Support Unit
 W. Kline, Manager, Nuclear Engineering Department
 B. Tuite, General Manager, Nuclear Operations
 R. Hansen, General Manager, Maintenance Programs Unit
 R. Vento, Manager, Health Physics
 D. Orndorf, Manager, Chemistry
 M. Ackerman, Director, Safety & Licensing

NRC

D. Kern, SRI
 G. Dentel, RI
 G. Wertz, RI

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
 IP 61726: Surveillance Observation
 IP 62707: Maintenance Observation
 IP 64704: Fire Protection Program
 IP 71707: Plant Operations
 IP 71750: Plant Support
 IP 84750: Radioactive Waste Treatment, and Effluent and Environmental Monitoring
 IP 90712: Inoffice Review of Written Reports of Power Reactor Facilities
 IP 92700: Onsite Follow-up of Written Reports of Nonroutine Events at Power Reactor Facilities
 IP 92901: Follow-up - Operations
 IP 92902: Follow-up - Maintenance
 IP 92903: Follow-up - Engineering
 IP 92904: Follow-up - Plant Support

ITEMS OPENED, CLOSED AND DISCUSSED

Opened/Closed

50-412/98-10-02	NCV	Inadequate Fire Protection Safe Shutdown Analysis for Boric Acid to Boric Acid Blender Valve 2CHS*FCV113A - Reference LER 50-412/98-05 (Section F8.1)
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Opened

50-334(412)/98-10-01	IFI	Scope and adequacy of NED review of Fire Protection Program to resolve issues in PR 2-96-789 (Section F7.1)
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Closed

50-334/98-28	LER	Automatic Reactor Trip On 'A' Steam Generator Low Level Coincident With Steam Flow/Feed Flow Mismatch Signal From Manually Tripped Transmitter Bistables of F-MS-475 (Section O8.1)
50-334(412)/97-05-05	VIO	Inadequate Control of Troubleshooting Activities Leads to ESF Actuation (Section M8.1)
50-412/97-11-08	VIO	Inadequate Work Instructions and Improper Control of Supplemental Work Instructions in Maintenance Work Request (MWR) (Section M8.2)
50-412/97-517(01013)	EA	Failure to Prevent Gas Binding of High Head Safety Injection Pumps (Section E8.1)
50-334/98-80-02	VIO	Failure to Promptly Correct Excessive Leakage of Residual Heat Valve MOV-RH-758 (Section E8.2)
50-334/97-08-05	VIO	Failure to Establish Adequate Radiation Monitoring System (RMS) Calibration Procedures (Section R8.1)
50-334/97-08-06	IFI	Documentation of RMS Detector Failures (Section R8.2)
50-412/98-05	LER	Inadequate Fire Protection Safe Shutdown Analysis for Boric Acid to Boric Acid Blender Valve, 2CHS*FCV113A (Section F8.1)

LIST OF ACRONYMS USED

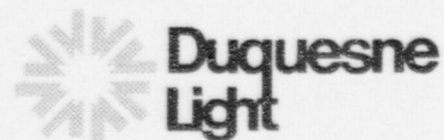
ANI	American Nuclear Insurers
CR	Condition Report
CREBAPS	Control Room Emergency Bottled Air Pressurization System
DLC	Duquesne Light Company
DR	Deficiency Report
EA	Enforcement Action
gph	Gallons Per Hour
HHSI	High Head Safety Injection
IFI	Inspector Follow-up Item
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LLD	Lower Limits of Detection
MDAT	Multi-Discipline Analysis Team
MMP	Meteorological Monitoring Program
MPS	Maintenance Planning Scheduling
MSP	Maintenance Surveillance Procedure
MWR	Maintenance Work Request
NED	Nuclear Engineering Department
NFPA	National Fire Protection Association
NPDAP	Nuclear Power Division Administrative Procedure
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OST	Operating Surveillance Test
PR	Problem Report
QA	Quality Assurance
QC	Quality Control
QSU	Quality Services Unit
REMP	Radiological Environmental Monitoring Program
RH	Residual Heat
RMS	Radiation Monitoring System
ROC	Radiological Operations Center
RP&C	Radiological Protection and Chemistry
SG	Steam Generator
SJAE	Steam Jet Air Ejector
TLD	Thermoluminescent Dosimeter
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
VCT	Volume Control Tank
VIO	Violation

Management Meeting

Nuclear Regulatory Commission
&

Duquesne Light Company
Beaver Valley Power Station

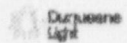

November 16, 1998



Slide 1

Management Meeting

Nuclear Regulatory Commission
&
Duke Energy Light Company
Beaver Valley Power Station
November 16, 1998



Slide 2

Agenda

- Introductions & Opening Remarks Jim Cross
- Plant Status Kevin Ostrowski
- Restart Action Plan Kevin Ostrowski
- Lessons Learned and Ongoing Areas of Emphasis Sushil Jain
- License Amendment Schedule Mark Ackerman
- Divestiture Status & Summary Jim Cross

Slide 3

Introduction

Jim Cross
President, Generation Group

Slide 4

Plant Status and Restart Action Plan

Kevin Ostrowski
Vice President, Nuclear Operations

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Slide 5

Plant Status

- ◆ Unit 1 Status
- ◆ Unit 2 Status
- ◆ Unit 2 Shutdown
- ◆ Outage Schedule

Slide 6

Restart Action Plan

- ◆ Restart Action Plan Milestones
- ◆ Restart Action Plan Follow-up
- ◆ Technical Specification Knowledge
- ◆ Technical Specification Compliance

Slide 7

Lessons Learned and
Ongoing Areas of Emphasis

Sushil Jain
Sr. Vice President, Nuclear Services

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Slide 8

Lessons Learned

- ◆ Performance Standards
- ◆ Technical Specification Knowledge
- ◆ Recognition and Resolution of Degraded Conditions
- ◆ Corrective Action and Operating Experience Programs
- ◆ Processes and Procedures

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Slide 9

Corrective Actions

- ◆ Safety Culture Training
- ◆ Technical Specification Training
- ◆ Strong Corrective Action / Operating Experience Programs
- ◆ Process and Procedure Reviews

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Slide 10

Ongoing Areas of Emphasis

- ◆ Problem Solving Process
- ◆ Human Performance Program
- ◆ Operations Procedures Backlog
- ◆ 12 Week Schedule

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Slide 11

License Amendment Schedule

Mark Ackerman
Manager, Safety and Licensing

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Slide 12

License Amendment Schedule

- ◆ Requests With Administrative Control
- ◆ Additional Priority 1 Requests
- ◆ Priority 2 and 3 Requests

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Divestiture Status
and Summary

Jim Cross
President, Generation Group

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