U. S. NUCLEAR REGULATORY COMMISSION
REGION I

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License Nos.	DPR-66 NPF-73
Licensee:	Duquesne Light Company One Oxford Center 301 Grant Street Pittsburgh, PA 15279
Facility:	Beaver Valley Power Station, Units 1 and 2
Location:	Shippingport, Pennsylvania
Inspection Period:	October 10 - November 20, 1995
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Date

Inspection Summary

This inspection report documents the safety inspections performed by resident inspectors in the areas of: plant operations; maintenance and surveillance; engineering; plant support; and safety assessment/quality verification. Additionally, inspections conducted by Region-based inspectors are documented in the areas of licensed operator requalification examinations, safety system functional self-assessments, and security. The results of these inspections are summarized in the executive summary.

EXECUTIVE SUMMARY
Beaver Valley Power Station
Report Nos. 50-334/95-20 & 50-412/95-20

Plant Operations

Both units were operated safely and in accordance with licensee procedures. Control room access was properly controlled and a professional atmosphere was maintained.

Licensed operator requalification examinations for both Units 1 and 2 demonstrated that licensed operators possess the knowledge and skills necessary to ensure safe plant operations. The Requalification Program was effectively managed. Previously identified weaknesses have been adequately corrected. Job performance measures (JPM) and simulator scenarios were well defined, relevant and of appropriate difficulty necessary to evaluate the competence of licensed operators. Individual JPM performance and crew performance during simulator scenarios were properly evaluated by training and operation's personnel. Operator actions observed during the simulator examinations were appropriate for various plant conditions, and as a result, no crew failures were identified.

A previous violation involving a missed hold point during Unit 1 refueling operations was closed based upon corrective actions observed during previous inspections and a review of the root cause analysis. The root cause analysis was well done. It was accurate and self-critical and effectively addressed contributing causes beyond those discussed in the violation response.

Maintenance

Proper sensitivity to minimizing equipment outage times was shown for all activities inspected although minor delays were experienced in maintenance work at the alternate intake structure.

Good oversight by Quality Assurance was observed during maintenance activities. A request for Quality Assurance assistance during a repair was indicative of improved credibility of the Quality Assurance staff.

Controls over substation work activities were not properly implemented during excavation work at the site switchyard. Management immediately stopped all work in the switchyard, held a critique, and implemented corrective actions.

Engineering

Good performance by system engineers was evident by the engineers questioning the frequency of oil changeouts, by prompt action on a 10 CFR Part 21 report on governor valve linkages, and by good involvement in filter bank testing.

Appropriate corrective actions were taken for several reportable events; however, resolution of inaccuracies in determining main steam safety valve set points as described in Information Notice 94-56 was not timely.

(EXECUTIVE SUMMARY CONTINUED)

Unresolved item 334/412-94-17-02 concerning the adequacy of a review of pump technical information was closed. Good attention to detail during a biennial procedure review led to identification of a torque value discrepancy.

Unresolved items 334/412-95-09-03 and 04 concerning MOV actuator bolt overtorquing and material issues were closed. The overtorquing was due to inadequate implementation of a 1992 Limitorque Technical Update, a design control violation. The improper fasteners were likely from original construction. Good root cause analyses were performed, and comprehensive corrective actions were taken to ensure proper torquing and use of fasteners.

Zebra mussels were recently identified at the site. The licensee is being properly proactive in developing strategies to minimize impact on plant safety systems.

A proper level of independent reviews of steam generator eddy current data has been used, thus minimizing the potential for missed indications.

Duquesne Light's safety injection system SSFI was conducted well. The licensee's team exhibited excellent teamwork and a good questioning attitude. The team concluded that the safety injection system is capable of performing its intended safety function. The organizational response to the team's findings was generally good. The team identified weaknesses in several areas which could have more widespread applicability. Examples include trending of performance test results and procedure updates following system modifications. Strengths identified by the team included the knowledge and responsiveness of the system engineering staff and the vendor technical manual program.

Plant Support

In general, the licensee maintained an effective security program. Management support is good, as evidenced by personnel and package access control equipment upgrades, ongoing assessment equipment upgrades, and other security equipment enhancements. The CAS/SAS operators were knowledgeable of their duties and responsibilities and were not engaged in activities that would interfere with their response functions. Security training was being performed in accordance with the NRC-approved training and qualification plan. Vital area access control was being properly administered. Although not requiring compensatory measures, a significant backlog of security equipment work requests existed and included many work requests involving closed-circuit television (CCTV) cameras. Continued growth in this backlog could potentially affect the alarm station operator's ability to accurately assess the cause of an alarm due to the aggregate of deficiencies. This was discussed with security management and the licensee indicated that they would reduce the backlog of open security work requests affecting assessment capabilities. One previously identified fitness-for-duty item was closed based on document reviews and discussions with licensee management.

(EXECUTIVE SUMMARY CONTINUED)

Safety Assessment and Quality Verification

Unresolved item 334/95-07-01 concerning the adequacy of a basis for continued operation and qualification of inadequate core cooling monitor breakers was closed based upon additional information which verifies their qualification.

Violation 334/95-09-01 concerning failures by the licensee to appropriately monitor for clogging of river water strainers and to adequately address charging pump oil cooler erosion was closed based upon completion of appropriate corrective actions.

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1.0 MAJOR FACILITY ACTIVITIES

There were no significant operational events at either unit during this inspection period. Unit 1 operated at full power throughout this inspection period except for two power reductions to perform maintenance. From November 3 to November 5 power was reduced to 37% to repair the level control valve (LCV-SD-106B) for heater drain tank SD-TK-2. On November 14 power was reduced to 97% to repair the position indicator arm on main turbine governor valve GV-1. Unit 2 operated at full power throughout this inspection period.

2.0 PLANT OPERATIONS (71707, 71001)

2.1 Operational Safety Verification

Using applicable drawings and check-off lists, the inspectors independently verified safety system operability by performing control panel and field walkdowns of the following systems: fuel pool cooling, annunciator knife switch alignment, service water, control room bottled air pressurization system and dedicated auxiliary feedwater system. These systems were properly aligned. The Unit 2 service water system was inspected in accordance with the guidelines of Section 2.05 of the 71707 Core Inspection Procedure. The inspectors did note the improved material condition of this system. The inspectors observed plant operation and verified that the plant was operated safely and in accordance with licensee procedures and regulatory requirements. Regular tours were conducted of the following plant areas:

- Control Room
- Auxiliary Buildings
- Switchgear Areas
- Access Control Points
- Protected Areas
- Spent Fuel Buildings
- Diesel Generator Buildings
- Safeguards Areas
- Service Buildings
- Turbine Buildings
- Intake Structures
- Yard Areas
- Containment Penetration Areas

During the course of the inspection, discussions were conducted with operators concerning knowledge of recent changes to procedures, facility configuration, and plant conditions. The inspectors verified adherence to approved procedures for ongoing activities observed. Shift turnovers were witnessed and staffing requirements confirmed. The inspectors found that control room access was properly controlled and a professional atmosphere was maintained. Inspectors' comments or questions resulting from these reviews were resolved by licensee personnel.

Control room instruments and plant computer indications were observed for correlation between channels and for conformance with technical specification (TS) requirements. Operability of engineered safety features, other safety related systems, and onsite and offsite power sources were verified. The inspectors observed various alarm conditions and confirmed that operator response was in accordance with plant operating procedures. Compliance with TSs and implementation of appropriate action statements for equipment out of service were inspected. Logs and records were reviewed to determine if entries were accurate and properly identified equipment status or

deficiencies. These records included operating logs, turnover sheets, system safety tags, and the jumper and lifted lead book. The inspectors also examined the condition of various fire protection, meteorological, and seismic monitoring systems.

2.2 Licensed Operator Requalification Program Evaluations

The inspectors performed a licensed operator requalification training (LORT) program evaluation for both Units 1 and 2 during the weeks of September 25 and October 9, 1995. This program evaluation included a review of the administered written examinations, job performance measures (JPM), and simulator scenarios. Inspector observations of individual and crew performance during the conduct of JPMs and simulator examinations were also performed. Other LORT programmatic aspects were also reviewed throughout the course of the inspection.

2.2.1 Licensed Operator Examinations

Fourteen licensed operators, consisting of four crews, were examined by the facility during this inspection. The requalification examination for each operator consisted of two dynamic simulator evaluations, five job performance measures, and a written static simulator and classroom examinations. Senior reactor operators (SRO) also had to make an event classification during the simulator examination. Results of the examinations included one written examination failure. Also, one individual, after participating in the scenario portion of the examination, withdrew from further evaluation for medical reasons.

The inspectors reviewed and observed portions of all three segments of the examination developed and administered to licensed operators. It was determined by the inspectors that the examination had been developed and administered in accordance with guidelines set forth in NUREG 1021, "Operator Licensing Examiner Standards." Several scenarios were observed, and, in each case, operator actions were appropriately evaluated by the respective unit's operations supervisor and the simulator training supervisor. With the exception of one scenario, all identified crew critical tasks were satisfactorily completed. The one scenario in which a crew critical task was not successfully completed involved a SRO who later withdrew from further evaluation for medical reasons. His withdrawal from the examination process was based upon the advice of the facility's medical doctor. The two reactor operators (RO), of the above mentioned crew, were later reexamined during two additional scenarios and under the leadership of a different SRO. Both ROs successfully passed this portion of the examination. The inspectors were kept informed of the SRO's situation and were in agreement with the facility's decision to develop compensatory actions as a result of the SRO's withdrawal from the examination process.

Command and control activities and communications were deemed acceptable as observed by the inspectors during the conduct of the simulator examination. Particular attention was paid to the effectiveness of communications as a result of prior communication problems noted during the review of the previous two week's examination results. Communication expectations by upper

management had resulted in more stringent requirements in regard to personnel repeat-backs just prior to the start of the annual examination process. Consequently, crew failures had occurred due to their inability to progress through the emergency operating procedures (EOP) in a timely fashion. This failure to progress in a timely fashion was attributable to excessive verbatim repeat-backs throughout certain scenarios in which timeliness was of utmost importance. Management quickly and appropriately responded to correct the situation by issuing a revised communication's standard, which provided instances in which verbatim repeat-backs were essential and other instances in which paraphrasing was appropriate. Formal classroom and simulator training was subsequently provided to personnel prior to the start of their examination. As an interim measure, informal training was provided to those licensed operators who were presently on shift and would not be attending requalification training until some future scheduled date.

The inspectors determined that the problems with communications had essentially been corrected, however supervision intended on modifying the communications standard as necessary following the completion of classroom and simulator training sessions for both units. As mentioned previously, communications were acceptable, as witnessed by the inspectors during the conduct of several scenarios, however, there were some discernable differences between crews and individuals standing the assistant nuclear shift supervisor position. The inspectors concluded that the facilities plan to finalize the communications standard into a workable and usable tool that all licensed operators would utilize in the same manner, thus ensuring consistency between crews and individuals was appropriate.

Requalification job performance measure (JPM) administration and evaluation of performance by the facility were good. The inspectors observed the administration of job performance measures, both in-plant and on the simulator, to ten operators. The job performance measures were relevant to operator tasks, were consistently administered by the different evaluators, were technically sufficient to discriminate operator abilities, and were appropriately evaluated. The performance of the JPMs by the operators was also good, in that, operators were precise in most of their actions while simulating JPMs and the evaluators provided excellent feedback for all operator actions. The simulated in-plant JPMs were administered and performed in a very professional manner.

Both the static examination and the comprehensive classroom written examination administered during this inspection were reviewed for adequacy and appropriateness to the sampling plan. The inspectors determined that both classroom and static written examinations were appropriate and performance based. Also, the majority of questions were found to be written at the appropriate comprehension level. The inspectors identified only a few instances in which a question's stem and distractors could have been strengthened. These instances were discussed with facility training personnel who indicated that future revisions would be made to those questions identified by the inspectors.

2.2.2 LORT Program Assessments

The inspectors noted that the facility had adequately addressed and corrected concerns identified during the previous years NRC requalification program evaluation. These concerns and subsequent corrective actions are detailed as follows:

- Some training instructors were involved with both the training of operators and the subsequent development/administration of the annual examination. Measures were taken, such that if an instructor is involved in the administration of the examination, this individual will not be involved in exam development and will have no knowledge of the examination content until after completion of the instruction.

- Crew composition varied from one crew to the next as did the evaluation process. Crew composition is now more equitable in that a shift technical advisor (STA) makes up part of each crew. There was no surrogate acting as both the STA, nuclear shift supervisor (NSS), and simulator instructor. Also, the respective unit operation's supervisor was present during both scenarios for individual and crew evaluations.

- Scenarios were weak in challenging the crew following emergency operating procedure (EOP) entry. All scenarios witnessed by the inspectors included several malfunctions following EOP entry that affected the event mitigation strategy, and thus providing a better standard for evaluating the diagnosis and decision making capabilities of the operating crew. The inspectors determined that the scenarios overall were more challenging and that significant improvements had been made.

Other notable changes to the training program included the placement of one additional instructor in the simulator during the conduct of training and evaluation scenarios, thus allowing more effective interface between the licensed operators and the instructor. Also, following the completion of a scenario or scenario set, the NSS now discusses the pros and cons of the scenario exercise with the simulator instructor and then conducts the debriefing with his crew. A newly developed, scenario self-facilitation checklist was utilized by the NSS during the evaluation of his crew's performance.

The inspectors determined that the student/supervisor feedback system was effectively utilized. Specifically, the inspectors noted that the participation of certain non-licensed personnel during simulator training has continued as a result of positive feedback received back from licensed operators.

The training facility has maintained the LORT examination banks up-to-date. Designated training instructors were responsible for the maintenance of the written, JPM and scenario examination banks. The inspectors discussed and reviewed with certain personnel the method and process by which they reviewed,

It was determined that appropriate remedial actions were taken for those individuals or crews that failed their annual requalification examination. For those instances in which an individual or crew failed, they were immediately removed from licensed duties and placed into an accelerated re-training program. This program formally identified those areas in which weaknesses had been noted. After completion of the re-training program, individuals or crews were re-examined in those areas in which they had previously failed. Licensed operators were reinstated only after successful completion of the examination.

The inspectors also observed the conduct of classroom training given to the licensed operators, as part of their annual requalification training, and found this training acceptable. Lesson plans were also reviewed and found to be well structured along with detailed enabling and terminal objectives.

2.2.3 Operator License Conditions

The inspectors reviewed a sample of thirteen licensed operator medical files to ensure that medical examinations were being conducted biennially. The inspectors determined that physical examinations were performed biennially as required by 10 CFR 55.21. However, the inspectors determined that controls could be strengthened regarding the manner in which biennial medicals are tracked and scheduled.

The inspectors noted that the 60-day window established by the training department for scheduling the medical examinations was approximately 2 weeks prior to the 24-month anniversary date since the last medical examination was performed and extended approximately 6 weeks past the anniversary date. The inspectors review of medical records identified only one example in which an operator exceeded the biennial date, which was by only 5 days. The inspectors were nonetheless concerned with the potential for exceeding the biennial anniversary date by as much as 6 weeks with the established tracking system.

10 CFR 55.21 and ANSI/ANS 3.4 require a medical examination be given every 2 years, but do not specifically define this period or specify a grace period. NRC guidance has established that the biennial requirements can extend beyond 730 days, if the requirement is met during the anniversary month of the second year. For example, a medical examination performed on January 10, 1995, would be required by January 31, 1997. The training manager acknowledged the concerns of the inspectors and indicated he would implement a change to the tracking system to ensure that medicals in the future are scheduled to be completed within the anniversary month of the second year.

The inspectors reviewed the facility's program for restoration of active operator license status following inactivation and found the program to be acceptably documented and administered. Three licensed SROs were identified as having returned to active licensed status during the last year. The records for these individuals were reviewed and determined to be both complete and in accordance with administrative requirements.

2.2.4 Management Oversight

Both operations and training management were actively involved in the development and administration of the LORT program. This determination was based upon the inspectors' observations of their participation in the requalification examination process and the conduct of a regularly scheduled Operations Training Committee Meeting (OTCM). The inspectors attended OTCM 95.6 and noted that subject areas of discussion included communication standard feedback, probabilistic risk assessment, self-checking techniques, plant status update, upcoming LORT schedule and objectives, and log keeping expectations. Extensive discussions were held regarding recent changes to the communications standard.

The inspectors also reviewed the facility's 93/95 Cycle 1 LORT program report and quality assurance audit, BV-C-94-11. Both reports were comprehensive and supported the fact that the training facility, together with operations, were maintaining the proficiency of the licensed operating staff.

2.2.5 Conclusions

The inspectors determined that the facility was implementing and maintaining a requalification training program that was based upon a systematic approach to training. Based upon the observations of the annual operating examinations, the inspectors concluded that the licensed operators possess the knowledge and skills necessary to ensure safe plant operations. The requalification training program was seen as being effectively managed.

2.3 Missed Quality Control Hold Point During Unit 1 Reactor Vessel Head Lift (Violation 334/94-27-01) (Closed)

On January 13, 1995, refueling personnel failed to complete a quality control (QC) inspection of the head lift rig critical welds during a Unit 1 reactor vessel head lift. In their response to the violation, the licensee described, the cause for the violation as personnel error by the Refueling Assistant who was responsible for ensuring proper performance of the procedure. Corrective actions for the violation included training on performance standards for refueling and QC personnel, field monitoring to ensure the effectiveness of the training, a case study and root cause evaluation of the event, and head lift rig inspection during head re-installation.

The inspectors reviewed the licensee's root cause analysis report and concluded that it was accurate and appropriately self-critical. Other problems identified in the report, that were not specifically stated in the violation response as contributing causes for the violation, included failures in command and control and loss of independence by the QC inspector. The inspectors considered the failures in command and control and loss of independence by the QC inspector to be contributing causes for the violation. All of these problems were effectively corrected in the short term as evidenced by the Unit 1 end-of-outage refueling operations (see Section 2.2 of Inspection Report 334/95-06) and the Unit 2 beginning-of-outage defueling operations (see Section 2.8 of NRC Inspection Report 412/95-07). As noted in the violation response, the licensee intends to continue field monitoring of

refueling activities to verify that standards will be maintained in the long term. The inspectors concluded that the licensee effectively resolved the issues associated with this violation. This violation is closed.

3.0 MAINTENANCE (62703, 61726, 71707)

3.1 Maintenance Observations

The inspectors reviewed selected maintenance activities to assure that: the activity did not violate Technical Specification Limiting Conditions for Operation and that redundant components were operable; required approvals and releases had been obtained prior to commencing work; procedures used for the task were adequate and work was within the skills of the trade; activities were accomplished by qualified personnel; radiological and fire prevention controls were adequate and implemented; QC hold points were established where required and observed; and equipment was properly tested and returned to service.

The maintenance work requests (MWRs) listed below were observed and reviewed. Unless otherwise indicated, the activities observed and reviewed were properly conducted.

- MWR 047843 Diaphragm Repair for 2CHS-48

The inspectors noted proper prioritization of this work activity by Mechanical Maintenance with input from Operations and Chemistry. This valve is the outlet isolation valve of 2CHS*Demin22, the lithium removal ion exchanger. Lithium concentration is normally maintained at about 2.0 ppm, but due to a lithium build-up rate of .05 ppm per day, this ion exchanger can be out of service for a few days before the upper specification of 2.20 ppm is reached. Accordingly, this valve was repaired and returned to service in a timely manner. The licensee determined that excessive force had been used by operators in closing the valve (via a reach rod). Corrective actions are under development by the licensee.

- MWR 047134 Disassemble, Inspect, and Repair 2SWS-SOV-130A

The inspector noted good quality assurance (QA) oversight of this valve repair. This QA oversight was requested by the Mechanical Maintenance Director as part of continuing corrective actions to address Target Rock solenoid valve repairs (see NRC Inspection Report 95-07). The request for QA assistance during this repair is indicative of improved credibility on behalf of the QA organization.

- MWR 045450; Alternate Intake Structure Activities
  024452;
  041973

These activities involved valve repairs of 2SWE-253, -220, -PRV-121, and cleaning of the intake bays. These activities were completed satisfactorily well within the 7-day limiting condition for operation (LCO) per technical specifications. The inspector did note minor job coordination problems and

pre-planning issues as evidenced by conflicting clearances between the I&C work and mechanical maintenance work. Also, the SWE-220 valve replacement was delayed by 2 hours as the mechanics awaited the receipt inspection of new capscrews while the new valve had already been fitted into place. Minor delays were also experienced due to operating problems with the submersible pumps needed to de-water the bays. These delays were not of significant regulatory concern as they were minor in nature and had minimal impact on the timely completion of the tasks. The inspector discussed these issues with maintenance management who have also noted improvements are needed in craft efficiency. The licensee is currently performing a self-assessment of this area and the implementation of the 12-week work planning schedule. Licensee management has previously identified craft efficiency as one of the "top ten" issues in need of resolution.

- MWR 044453 Replace CREBAPS ball valve VS-19

During this job the inspectors observed good performance by qualified craft personnel, close supervision by maintenance supervision, oversight by maintenance management, and active involvement and performance of quality checks by Quality Services. This job was worked continuously to minimize outage time. The job was well planned, all needed parts were available before starting the job, and Technical Evaluation Report TER 8843 thoroughly evaluated replacement of the valve with a new model valve.

- MWR 047133 Replace Locknuts on AFW Pump Governor

Replacement of these locknuts resolved a 10 CFR Part 21 report as discussed in Section 4.7 of this report.

3.1.1 Auxiliary Feedwater Pump Preventive Maintenance

The Unit 2 steam driven auxiliary feedwater pump was removed from service for approximately 12 hours for minor preventive maintenance activities. One item involved the change-out of the oil for the pump. The inspector questioned the frequency of this oil change and was informed that it was an annual preventive maintenance task. Given the fact the pump operates less than 24 hours in a year and oil sample results did not identify any degradation, the inspector questioned the appropriateness of this frequency. Concurrently, the system engineer also questioned this frequency and its impact on system availability. Subsequently, the licensee is currently evaluating an increase in the oil change-out frequency to every 18 months. The oil sampling frequency will remain unchanged at every 6 months. The licensee is currently re-evaluating all fixed frequency preventive maintenance oil changes based on performance. The inspector had no further concerns.

3.1.2 Switchyard Activities

The inspectors observed excavation activities in the switchyard to ensure that all applicable precautions and restriction were being properly followed. This excavation work was being done to correct drainage and rainwater run-off problems. Ownership of the switchyard by the station is demonstrated by the fact that the site Electrical Maintenance Director and Unit Operations Manager

must review and approve the work restrictions placed on the substation personnel. Authorization of the designated work activities are made by the Unit Operations Manager. The licensee programmatic controls were found to be thorough and included lessons learned from industry events. Vehicle access requirement for the switchyard are delineated in Nuclear Power Administrative Procedure 3.15, "Beaver Valley Substation Access and Controls." However, the inspectors identified that implementation of these requirements was deficient and had the potential to impact off-site power supplies. Contrary to licensee requirements, the inspectors identified that the substation access gate was left unlocked, and positive access control was not maintained as the workers were not within sight of the gate while it was unlocked. The inspector also observed that a back-hoe was being operated in the reverse direction without the use of a spotter. This maneuvering of the back-hoe was being conducted within the tight confines of the support structures for the off-site 345KV buses. No other worker was within visual range of the back-hoe. The inspector questioned the vehicle operator on the appropriateness of his actions given the potential consequences of backing into a support structure. The worker informed the inspector that he was unaware of any requirement for a spotter. Special instructions added to the substation access request form specifically for this work activity, stated that "a second person shall be used at all times during all vehicle movement (to include forwarding, backing, lifting, scooping, and dumping)." The work party leader was also found to be unaware of this requirement for a back-hoe. A spotter was immediately assigned to assist in the backhoe maneuvering. The inspectors informed licensee management of the above issues. Management immediately stopped all work in the switchyard and held a critique with the involved individuals to ensure all work restrictions were understood and followed by the work party. After work was authorized to resume, management personnel maintained oversight of the remaining excavation activities. The inspectors noted that good controls over switchyard activities were observed during previous inspections. The licensee is performing a root cause analysis for this event. The inspectors were satisfied with these actions, and the remaining work was completed without incident.

3.2 Surveillance Observations

The inspectors witnessed/reviewed selected surveillance tests to determine whether properly approved procedures were in use, details were adequate, test instrumentation was properly calibrated and used, technical specifications were satisfied, testing was performed by qualified personnel, and test results satisfied acceptance criteria or were properly dispositioned. The operational surveillance tests (OSTs), maintenance surveillance procedures (MSPs), and Beaver Valley Tests (BVTs) listed below were observed and reviewed. Unless otherwise indicated, the activities observed and reviewed were properly conducted without any notable deficiencies.

OST 1.43.7	Noble Gas Monitors Functional Test (SPING)
MSP 1.04-I	Solid State Protection System Train A Bi-Monthly Test
BVT 1.16.6	SLCRS Train 'A' Filter Efficiency Test

BVT 1.16.8 Main Filter Banks Charcoal Test Sample Removal

The inspector noted very good involvement by the system engineer for the retesting of the filter banks following charcoal replacement, and efforts towards minimizing system unavailability. The charcoal had to be replaced due to failing its iodine removal efficiency test. With the key support of mechanical maintenance personnel, the system engineer effectively coordinated the replacement and re-test such that the system was returned to operable status within a record 2 days when this activity typically takes 3 days to complete.

4.0 ENGINEERING (37551, 40501, 90700, 90712, 92700, 93801)

4.1 Review of Written Reports

The inspectors reviewed Licensee Event Reports (LERs) and other reports submitted to the NRC to verify that the details of the events were clearly reported, including accuracy of the description of cause and adequacy of corrective action. The inspectors determined whether further information was required from the licensee, whether generic implications were indicated, and whether the event warranted further onsite follow-up. The following LERs were reviewed:

Unit 1:

95-04 Condition Prohibited by Technical Specifications - Main Steam Safety Valve Setpoints Not Within Specifications

This LER was submitted following the licensee's evaluation of NRC Information Notice (IN) 94-56 "Inaccuracy of Safety Valve Set Pressure Determination Using Assist Devices." This IN discussed inaccuracies in the Trevitest method of determining the setpoints of Dresser model 3707R safety valves. The error in the Trevitest method of determining the safety valve setpoints involved the use of "mean seat area (MSA)." During comparative safety valve testing, Furmanite (the Trevitest vendor) determined that the MSA for Dresser model 3707R valves required adjustment. The revised MSA was smaller and resulted in higher calculated safety valve setpoints. IN 94-56 stated that the new MSA information had been sent to eight other licensees (other than the licensee mentioned in the IN) that have used the Trevitest device to test this specific valve model. Duquesne Light Company was not one of the eight licensees. Twelve of these valves are installed at Beaver Valley - all are Unit 1 steam generator safety valves and all were set using the Trevitest methodology.

Duquesne Light Company received IN 94-56 in August of 1994, and assigned an internal response due date of November 23. It was not until November 23, however, that the licensee began to look for the Furmanite correspondence referenced in the IN. On January 2, 1995, Unit 1 entered a refueling outage with the steam generator safety valve issue still unresolved. The licensee did some safety valve testing prior to the shutdown, but was still using the old MSA. During the outage, the licensee decided that the revised MSA was applicable. Using the revised MSA, maintenance engineers determined that, based on the most recent test data, six safety valves were high out of the

setpoint tolerance band. Testing of the six valves following the outage showed that five were actually out of tolerance. The maximum out of tolerance condition was +11 psig, or about +1%. This condition was of little or no safety significance.

Overall, the inspectors concluded that the licensee's actions to address this issue were appropriate, except in the area of timeliness. From the wording in the IN, it was evident that the issue pertained to Beaver Valley. The licensee should have pursued the Furmanite documentation soon after receiving the IN, rather than waiting for approximately three months.

95-05 Technical Specification 3.0.3 Entry Due to Isolation of Control Room Emergency Breathing Air Pressurization System

This entry into Technical Specification (TS) 3.0.3 occurred following an inadvertent control room emergency bottled air pressurization system (CREBAPS) actuation. Once the invalid actuation was verified, the air pressurization bottles were appropriately isolated, forcing an entry into TS 3.0.3. The cause of this event was stated in the LER as: "a spurious actuation signal resulting from electrical noise spiking on either the Train "A" Control Room Radiation Monitor, RM-RM-218A, or the Train "A" Containment High Range Radiation Monitor, RM-RM-219A. The specific component causing the electrical noise spiking could not be identified." The inspectors noted that the root cause analysis documentation did not support this conclusion. On April 20, 1995, no alarms or indications were received in the control room to indicate that RM-RM-218A had initiated the CREBAPS actuation and no abnormal indications were associated with RM-RM-219A.

The inspectors also questioned the prudence of one of the LER corrective actions as a long-term solution to the problem. Corrective action number two stated: "Procedural revisions have been instituted to isolate the CREBAPS headers during control room radiation monitor testing. Technical Specifications allow the CREBAPS system to be isolated up to eight (8) hours for the performance of instrumentation and control system testing. Recharging the CREBAPS bottles is a slow process and isolating the headers during tests that have the potential to inadvertently discharge the bottles will ensure the bottles remain fully pressurized and readily available for realignment during valid discharge demands." The stated safety enhancement of these procedure revisions was not readily apparent. The licensee has demonstrated the ability to isolate the CREBAPS bottles following an inadvertent actuation prior to reaching the TS low pressure limit. Thus, there is no safety consequence to an inadvertent actuation. Because of the procedure revisions, the CREBAPS bottles are isolated more frequently, and the availability of CREBAPS has been reduced. These observation were discussed with the Operations Experience Group Manager, who stated that he would review the root cause analysis and the actions being taken to address the problems with CREBAPS actuations. Additional actions to pursue and eliminate the electrical noise problem was committed to in the LER and are being pursued.

95-06 Pressure Boundary Leakage Results in Plant Shutdown

This event was inspected as discussed in NRC Inspection Report 95-13.

95-07 Residual Heat Removal System Overpressure Protection Deficiency

Engineering review of a vendor advisory letter identified a potential weakness in overpressure protection for the RHR system and developed appropriate corrective actions.

Unit 2:

93-14 Required Plant Shutdown Due to Inoperable Steam Driven Auxiliary Feedwater Pump

This LER involved problems with the Unit 2 steam driven auxiliary feedwater (AFW) pump in late November and early December of 1993. The problems with the pump resulted from deficiencies with the governor and the associated solenoid operated steam admission valves. Section 3.1.3 of NRC Inspection Report 412/93-30 describes these problems in more detail.

The licensee's continuing efforts to ensure proper AFW pump governor operation at both units was documented in Section 4.3 of Inspection Report 412/94-20 and Section 3.1.3 of Inspection Report 412/95-09. Corrective actions for the steam admission valve problems were developed as part of an initiative to deal with a broad range of Target Rock solenoid operated valve issues. This initiative was documented in Section 3.1.2 of Inspection Report 412/94-02. The root cause analysis for the steam admission valve failures was issued on September 11, 1995. The root cause for the admission valve failures was primarily attributed to maintenance errors on 2MSS-SOV105A. As corrective actions to address the maintenance errors, the licensee instituted extensive procedure changes and maintenance training. The inspectors concluded that the licensee's evaluations and actions to address the AFW pump governor and steam admission valve problems were comprehensive and appropriate.

95-01 Condition Prohibited by Technical Specifications - Entry Into Technical Specification 3.0.3 Due to Isolation of Control Room Habitability Air Bottle Subsystem

This entry into Technical Specification (TS) 3.0.3 was initiated on January 15, 1995, when an electrical power spike caused the Unit 1 A-train control room radiation monitor to alarm. The radiation monitor alarm led to a control room isolation signal and subsequent start of the control room emergency bottled air pressurization system. Once the invalid high radiation alarm was verified, the air pressurization bottles were appropriately isolated, forcing an entry into TS 3.0.3.

The electrical spike was caused when a power connector was reinstalled on the A-train containment high range radiation monitor. The A-train control room and containment high range radiation monitors, along with the associated B-train monitors, are located in the same cabinet. All four monitors had poor electrical isolation, and were extremely susceptible to electrical noise generated elsewhere in the cabinet. To solve the electrical noise problem, the licensee: (1) added filter capacitors to the power supplies for the components in the radiation monitor cabinet; (2) added ferrite beads and shielding to various signal cables associated with the radiation monitors, and

(3) raised the discriminator voltage on the control room radiation monitors. Post modification testing showed that the noise problems were effectively eliminated by the changes. The inspectors concluded that the licensee's actions to address the electrical noise problem were thorough and appropriate.

The above LERs were reviewed with respect to the requirements of 10 CFR 50.73 and the guidance provided in NUREG 1022. Generally, the LERs were found to be of high quality with good documentation of event analyses, root cause determinations, and corrective actions. These event reports are closed based on in-office review of the event report and onsite inspections.

4.2 Adequacy of Dresser Pump Technical Information Review (Unresolved Items 334/94-17-02 and 412/94-17-02) (Closed)

These unresolved items were opened because of the potential that the licensee had prior opportunity to identify a discrepancy in the hold-down bolt torque for the station high head safety injection (HHSI) pumps during a 1992 audit of Dresser Pump. The primary concern was that the licensee's program for the review of vendor technical information (VTI) might have been deficient. To resolve this issue, the inspectors evaluated the VTI program and reviewed the history of the torque discrepancy issue for the HHSI pumps. The VTI program evaluation was completed in May of 1995. The program was found to be excellent. The detailed results of this inspection were documented in Inspection Report Numbers 334/95-09 and 412/95-09.

The specific torque problem with the HHSI pumps was primarily caused by a Unit 2 vendor drawing, issued in 1982, that indicated the wrong torque value (450 ft-lbs). This drawing was separate from the pump technical manuals, and the technical manuals did not mention a pump hold-down bolt torque value in 1982. It was the 450 ft-lb torque value that was eventually applied in the field at both units. In 1983, a change to the Unit 1 pump technical manual indicated the correct torque value (80 ft-lbs), but this was not compared with the Unit 2 drawing. In 1993, the correct torque value of 80 ft-lbs was inadvertently placed in the Unit 2 technical manual during a transfer of unrelated material from the Unit 1 technical manual. This later mistake allowed a procedure writer to identify the torque discrepancy during a biannual procedure review. This sequence of events indicated some earlier lack of attention to detail, but good attention to detail during the biannual review.

One of the concerns identified in Inspection Report Numbers 334/94-17 and 412/94-17 was that the licensee had the opportunity to identify the HHSI pump torque discrepancy during a 1992 audit of Dresser Pump. This statement was found to be incorrect. The inconsistencies identified in 1992 were not with the pump, but with the motor and gear box hold-down bolts, and were appropriately resolved.

During the above reviews, the inspectors did not identify any significant regulatory issues related to the HHSI pump hold-down bolt torque value discrepancy. Additionally, as noted in Inspection Report Numbers 334/94-17 and 412/94-17, the higher torque value of 450 ft-lb was ultimately found acceptable. This unresolved item is closed.

4.3 Motor Operated Valve Actuator Bolt Over-Torquing (Unresolved Items 334/95-09-03 and 412/95-09-03) (Closed)

Section 4.2 of Inspection Report Numbers 334/95-09 and 412/95-09 discussed a problem with over-torquing of 17 motor operated valves due to inadequate implementation of Limitorque Technical Update 92-01. The over-torquing issue was identified as an unresolved item pending review of safety significance, the root cause analysis and the licensee's long-term corrective actions.

The root cause analysis report was completed on July 26, 1995, by the licensee's Independent Safety Evaluation Group (ISEG). The two root causes identified were "procedure wrong due to incorrect facts" and "standards, policies and administrative controls not strict enough." The first root cause related directly to the error in the procedure created by inadequate implementation of the Limitorque information. The root cause report hypothesized that the procedure error was caused by less than adequate understanding of mechanical bolting requirements by personnel with primarily electrical backgrounds; however, the supporting discussion in the report did not clearly develop this hypothesis. The inspectors discussed the hypothesis with the Director of ISEG and the event investigator. Through the discussions, ISEG was found to have a good basis for the hypothesis.

The second root cause in the over-torquing analysis report, "standards, policies and administrative controls not strict enough," related to the adequacy of the licensee's response to Information Notice 86-34, "Improper Assembly, Material Selection and Test of Valves and their Actuators." The root cause investigator determined that more thorough implementation of actions related to this Information Notice might have been a barrier to the torque problem. The inspectors considered this a good finding.

The overall safety significance of over-torquing the actuator bolts on the 17 MOVs was indeterminate, but was likely low. Only one valve, a Unit 1 main steam isolation valve bypass valve, was placed in a questionable state of operability due solely to the high torque. A second valve, a Unit 2 emergency diesel generator (EDG) service water supply valve, was placed in an questionable state of operability due to the high torque in conjunction with a configuration management problem. The configuration management problem is discussed in more detail in Section 4.4 below. In both cases, the operability of the valves was in question only following a seismic event. The Unit 1 main steam bypass valve is normally closed and must stay closed following the need for containment isolation. It is unlikely that the valve would open significantly due to failure of its actuator bolts. The Unit 2 service water valve is required to open in the event of a diesel start. Failure of the valve to open and supply water to the EDG could be remedied by manually opening a redundant supply valve from the control room.

The licensee's planned corrective actions for the over-torquing event included: (1) comprehensive training on fastener torquing requirements for maintenance, engineering and quality control personnel; (2) review of all current MOV procedures for proper torque specifications; (3) the reconciliation of torque and material specifications for all safety related MOV fasteners in site documentation; and (4, the development of a site bolting

standard. These planned corrective actions were very comprehensive and should be effective in ensuring the proper use of fasteners in MOVs at Beaver Valley. The licensee's failure to adequately incorporate the Limitorque Technical Update into site procedures is a violation of 10 CFR 50, Appendix B, Criteria III, "Design Control." However, as outlined above, this violation is consistent with Section VII of the enforcement policy and will not be cited. Unresolved Items 334/412/95-09-03 are closed.

4.4 Motor Operated Valve Actuator Bolt Configuration Management Problems (Unresolved Items 334/95-09-04 & 412/95-09-04) (Closed)

Section 4.2 of Inspection Report Numbers 334/95-09 and 412/95-09 discussed motor operated valve (MOV) actuator mounting bolt problems related to improper fastener material. This problem was identified as an unresolved item pending review of safety significance, the root cause analysis and the licensee's long term corrective actions.

The root cause analysis report was completed on July 28, 1995, by the licensee's Independent Safety Evaluation Group. The report took an in-depth look at the reasons for discrepancies with four valves. The inspectors concluded that the report contained an excellent level of detail and evaluation. The primary conclusion in the report was that standards, policies and administrative controls for actuator mounting bolts were less than adequate. Additional root causes identified less than adequate quality controls and one case of failure to correctly follow a procedure.

Several configuration issues were identified that were not evaluated in the root cause analysis report. Follow-up by Maintenance Engineering personnel showed that the problems were likely from original construction. Out of all the problems, only four were such that the valves were in a questionable state of operability. The four operability issues, which apparently related to original construction, were: two Unit 1 main steam isolation valve bypass valves that had only low strength carbon steel fasteners; one Unit 1 main steam isolation valve bypass valve that had two (out of four) low strength carbon steel fasteners (the other two fasteners were of appropriate strength); and one Unit 2 emergency diesel generator service water supply valve that had two (out of four) low strength carbon steel fasteners (the other two fasteners were of appropriate strength). The operability of these valves was in question only following a seismic event, and, for the reasons discussed in Section 4.3 of this report, the likelihood of plant safety impact due to these problems was considered low.

The licensee's planned corrective actions for the configuration problems included the same ones listed in Section 4.3 with one addition. The licensee also field verified the installed configuration of an additional 15 "high risk" valves at each unit. The additional verifications did not identify any more problems. The licensee also plans to include procedures to check for proper fasteners any time a valve undergoes maintenance. The inspectors concluded that these actions were appropriate. Unresolved Items 334/412-95-09-04 are closed.

4.5 Zebra Mussel Action Plan

During intake bay cleaning operations this quarter, the presence of Zebra mussels was identified at Beaver Valley for the first time. None of these mussels have yet been found in any plant systems and less than a dozen muscles were found in the intake bay. The mussels have not yet fully adapted to the conditions (*i.e.*, calcium concentration, pH, and temperature) of the Ohio River and a large influx or spawn has not yet been observed. Zebra mussels are prolific in their reproductive ability and attach in large colonies to hard surfaces which can impact water flow. The licensee has been monitoring and preparing for the migration of the Zebra mussels down the Ohio River. An action plan has been developed to minimize the impact these mussels may have on plant operation. The options available to the licensee are based on successful strategies at other nuclear facilities. These include, for example, a new chemical injection system which is scheduled to be installed this spring at the intake structure (current injection is at a point downstream of the intake structure). State permits have already been approved for continuous dosing with a non-oxidizing biocide. Also, intake bay cleaning will increase in frequency from every 6 months to every 3 months. The licensee is also evaluating the use of a special coating to prevent the attachment of these mussels. Illustrations and pictures of Zebra mussels have been provided to station personnel, especially mechanical maintenance personnel, in order to heighten awareness of these mussels for identification purposes. A mussel identification report is already a part of every maintenance package in which the river water system is opened for maintenance. Although the effectiveness of the licensee's plans cannot yet be assessed, the licensee is being properly proactive in planning for the eventual colonization of Zebra mussels in the Ohio river and minimizing the impact on station operations.

4.6 Steam Generator Eddy Current Review

The inspectors examined the independence and the level of review for the Beaver Valley steam generator eddy current test (ECT) results from the past refueling outages. Recently, at another nuclear facility personnel failed to identify that eight steam generator tubes were degraded greater than 40% through wall and were not plugged as required during the previous operating cycle. In this case, the review of the eddy current test results consisted of a primary and secondary review by the same vendor. The inspectors found that greater defense in depth exists for the review of Beaver Valley test results. In addition to the primary and secondary reviews by one vendor, Beaver Valley contracts an independent company to perform a tertiary review of all the ECT results. Additionally, ownership of the data by Beaver Valley is evident as the licensee has a qualified, in-house specialist examine all the data. The inspectors were satisfied that a proper level of independent reviews of the ECT data has been completed for Beaver Valley, thus minimizing the potential for a missed indication.

4.7 Dresser-Rand Part 21 Report

On October 16, 1995, the system engineer for the auxiliary feedwater (AFW) systems at Beaver Valley received a letter from Dresser-Rand made pursuant to 10 CFR Part 21. The letter reported that inadequate thread engagement from an

improperly sized locknut on Terry turbine governor linkages could result in loss of control of the Terry turbine if the locknut loosens and falls off. On the day of receipt of the 10 CFR Part 21 report, the system engineer observed and evaluated the condition of the locknuts on both units Terry turbines, wrote a problem report on the issue, and wrote a maintenance work request to replace the locknuts on the Unit 1 Terry turbine. Only the Unit 1 locknuts did not have full thread engagement. Continued operability was based on the locknuts not being loose after years of service. Following procurement of the proper locknuts, the Unit 1 Terry turbine locknuts were replaced on November 6. The inspector concluded that the system engineer acted promptly and properly in response to the 10 CFR Part 21 Report and that the defect was corrected.

4.8 Safety System Functional Evaluation

During the period October 23 through November 10, 1995, Duquesne Light Company performed an assessment of the high head and low head safety injection systems. The evaluation was modeled on the Safety System Functional Inspection detailed in NRC Inspection Procedure (IP) 93801, and was conducted by a team comprised of Duquesne Light personnel, contractors, and personnel from other utilities. The evaluation was conducted to assess the operational performance capability of the safety injection system through an in-depth, multi-disciplinary review. The primary goal was to verify whether the safety injection system was capable of performing its intended safety functions, with a secondary goal of identifying and correcting performance deficiencies.

4.8.1 Evaluation Plan

The inspector reviewed the Duquesne Light Company "Safety System Functional Inspection Technical Assessment Plan for Unit 1 - Safety Injection System (SI)," Revision 1, dated October 12, 1995. The plan laid out the purpose and scope of the assessment, as well as describing the functional area reviews. An attachment to the plan, Attachment 16.2, provided a checklist of inspection requirements, which references the NRC inspection procedure paragraphs. The inspection requirements were listed by functional area for the use of the individual reviewers for the separate functional areas.

4.8.2 Team Composition

The team consisted of two Duquesne Light Company personnel, two external utility personnel, and three contractors. In addition, a full-time team leader was assigned who had no concurrent duties. The inspector reviewed the experience and qualifications of the team members and determined that they exceeded the requirements of IP 93801. The technical diversity and broad experience base of the team members was considered a noteworthy strength.

4.8.3 Conduct of the Evaluation

The evaluation consisted of a comprehensive review of the Unit 1 safety injection components and system performance, including design requirements, operation, maintenance, surveillance and testing practices, performance history, personnel training, quality assurance, and the implementation of

corrective actions. In addition, the current status of the system, and the effectiveness of corrective actions were assessed by reviewing recent system performance, events, and problems.

The review was separated into five functional areas with specific reviewers assigned to each area. The functional areas were: quality assurance and corrective actions; surveillance and testing; operations; maintenance; and design engineering and configuration control. The design engineering and configuration control area was further separated into mechanical and electrical subareas. Each of the functional areas and subareas was assigned to a specific reviewer with appropriate background and experience.

The reviewers conducted document reviews, in-plant walkdowns, interviews of station personnel, and discussions with other members of the team to perform their assessments. Where information was not readily available to resolve an issue during interviews or walkdowns, or could not be supplied in a timely manner, a SSFI Question/Response Form was generated and transmitted to the manager of the responsible department. If it appeared that the issue raised an operability or reportability concern, the question was also forwarded to operations and licensing for appropriate evaluation and action. The functional area reviewer reviewed the response when it was received, to assess its adequacy to close out the issue. A database tracking of all requests for information, open questions, and unresolved issues was maintained, and updated daily throughout the team's evaluation. Any issues which remain unresolved when the final report is issued will be listed as SSFI open items, and entered into the Commitment Tracking System to ensure follow-up and closure.

Team meetings were conducted each morning at 8 a.m. to allow team members to share information and to brief the team leader on the status of their reviews and any identified issues. At 3 p.m. each day, the team leader conducted a briefing for department managers at which significant findings were discussed, new questions were provided, and the status of outstanding questions was reviewed.

The inspectors observed excellent teamwork in the sharing of information, review of findings, and discussion of various avenues to pursue an issue. The inspectors observed team members discussing related findings, how they fit together, what were the causes of the conditions observed, and who was the appropriate reviewer to pursue the matter to resolution. Examples included instrumentation calibration issues (instruments observed to be beyond their calibration dates during plant walkdown and instruments beyond calibration used to conduct surveillance testing) and procedure updates related to design changes (a design change implemented new instrument setpoints which were not incorporated into procedures for a period of 2 years).

4.8.4 Team Findings

The team's preliminary findings and conclusions were presented at their exit meeting conducted on November 10, 1995. The team concluded that the safety injection system was capable of performing its safety function. The team identified several strengths, including the system engineering program and vendor technical manual program. The weaknesses identified included follow-up

of industry issues, attention to detail, and follow-up of commitments. The team's final conclusions and findings will be documented in the team report, expected to be issued in late December 1995.

4.8.5 NRC Conclusions

The evaluation was well conducted and the team had excellent findings. The team looked beyond the symptoms they observed to identify causes of the identified problems. The response of plant staff to the team's questions was generally good. Corrective actions developed to address the team's findings were appropriate. The team's findings will be further reviewed after the issuance of the final report.

Management oversight of the team was good, with a senior manager attending the team's morning meetings and afternoon briefings. Senior management monitored the team's findings and progress but did not attempt to direct the team's activities. Direction of the team's activities was left to the appointed team leader. Senior management is also evaluating the response of plant staff personnel to the team's findings to determine what actions, if any, are needed to address weaknesses identified by the team.

5.0 PLANT SUPPORT (71750, 81700, 81502)

5.1 Radiological Controls

Posting and control of radiation and high radiation areas were inspected. Radiation work permit compliance and use of personnel monitoring devices were checked. Conditions of step-off pads, disposal of protective clothing, radiation control job coverage, area monitor operability and calibration (portable and permanent), and personnel frisking were observed on a sampling basis. Licensee personnel were observed to be properly implementing the radiological protection program.

The inspectors reviewed the dose limitations for a declared pregnant worker and found they were consistent with 10 CFR 20.1208. Specifically, the worker was placed on an administrative limit of 50 mrem per month for the remaining 7 months of the pregnancy. Dose received from the first 2 months was properly factored in to this limit. The worker was provided, by the licensee, with a copy of Regulatory Guide 8.13, "Instructions Concerning Pre-natal Exposure." The inspectors did, however, note that the worker was confused as to the radiosensitivity of the fetus due to verbal information provided by licensee training personnel, which conflicted with the accurate information provided by health physics personnel. The inspector provided the worker with additional information so that she fully understood the dose effect relationship for the fetus and the basis for the federal limit of 500 mrem. The inspectors also discussed with the Radiological Controls Manager the need for workers to be fully understanding of information presented to them.

5.2 Security Program

The inspector reviewed the security program during the week of November 6-9, 1995. The purpose of this inspection was to determine whether the licensee's security program met safeguards program commitments contained in the licensee's NRC-approved plan and regulatory requirements.

5.2.1 Effectiveness of Management Controls

The inspector determined that the licensee had controls for identifying, resolving and preventing security program problems. These controls included the implementation of a self-assessment program, performance of root cause analysis for human performance errors, required annual quality assurance (QA) audits, and ongoing shift supervision oversight of the program. A review of documentation applicable to these programs indicated that initiatives to minimize security performance errors and identify and resolve potential weaknesses were being implemented. Additionally, the security organization has a representative on the site safety committee and security force members participate in the safety training observation program by providing suggestions to enhance plant safety. The licensee's initiatives in those program areas were considered to be effective, based upon review of various program documentation.

5.2.2 Management Support

Management support for the licensee's physical security program was determined to be good. This determination was based upon the inspector's review of various program activities during this inspection and completion of the following security program enhancements made since the last physical security inspection, conducted in April 1995:

- procurement and installation of a biometrics system (hand geometry) as an enhancement to protected area personnel access control;
- the procurement of new X-ray equipment in the storeroom for control of packages into the protected area; and
- the replacement of a combined total of 96 camera monitors in both alarm stations.

5.2.3 FFD Audits

The inspector reviewed the 1995 QA audit of the fitness-for-duty (FFD) and medical programs, conducted April 26-August 24, 1995 (Audit No. BV-C-95-016), and determined that the audit was conducted in accordance with regulatory requirements. To enhance the effectiveness of the audit, the audit team included two independent technical specialists. The audit documented one deficiency, which required a written response and one observation. The audit findings were not indicative of programmatic weaknesses. The inspector determined, based on the review of the written response and discussions with the FFD administrator, that the audit was very comprehensive in scope, the

findings were reported to the appropriate level of management, and that the program was being properly administered.

5.2.4 Security Plan Changes

The inspector discussed licensee proposed changes to the NRC-approved security and training and qualification plans with security management. The inspector was informed by security management of the licensee's intent to submit changes to the plan in the near future under 10 CFR 50.54(p).

5.2.5 Protected Area Detection Equipment and Vital Area Access Controls

The inspector conducted a physical inspection of the protected area detection aids on November 8, 1995. The inspector determined by observation that the barrier and detection aids were installed and maintained as described in the plan.

The inspector determined, based on a review of the licensee's vital area (V/A) revalidation process, that individuals are granted access to specific V/As on an as-needed basis. A review of applicable documentation and discussions with security supervision by the inspector verified that the access lists for each V/A are updated and approved by the cognizant licensee manager or supervisor at least once every 31 days. The review ensures that only individuals whose specific duties require access to V/As during nonemergency conditions are included on the access lists. These V/A access controls were consistent with regulatory requirements.

5.2.6 Alarm Stations and Communications

The inspector observed central alarm station (CAS) and secondary alarm station (SAS) operations. Both the CAS and SAS were being maintained and operated as committed to in the plan. Inspector interviews of CAS and SAS operators found them knowledgeable of their duties and responsibilities. The inspector also verified that the CAS and SAS operators were not required to engage in activities that would interfere with assessment and response functions. In addition, the inspector verified that the licensee had communications capabilities with local law enforcement agencies, as committed to in the plan.

5.2.7 Testing, Maintenance, and Compensatory Measures

The inspector's review of testing and maintenance records for security-related equipment confirmed that the records committed to in the plan were on file and that the licensee was testing security equipment as committed to in the plan. A review of these records indicated that a prioritization schedule, based upon the need for posting security force members as compensatory measures is assigned to each work request. Based on the level of prioritization, repairs were being completed in a timely manner. The inspector's found the use of compensatory measures and security force overtime to be minimal, due to the efforts and prompt response of the maintenance group to repairs that require security force members postings as compensatory measures. However, the inspector's review of the security maintenance records verified that 76 security equipment work requests, dating back to 2/5/93, were open, *i.e.*, not

completed. Twenty-four of these involved closed circuit television (CCTV) camera repairs. Although none of these work requests required compensatory measures, continued growth in this backlog in th aggregate could potentially affect the alarm station operator's ability to accurately assess an alarm. This concern was discussed with licensee's management and the licensee indicated that they would reduce the backlog of open security work requests affecting assessment capabilities. This issue will be reviewed during a subsequent inspection.

5.2.8 Security Training and Qualification

The inspector randomly selected and reviewed nine security force members training, physical, and firearms qualification/requalification records. The inspector determined that the training had been conducted in accordance with the security training and qualification plan and that it was properly documented.

The inspector also observed weapons training. The training addressed tactical movement and target acquisition. The training instructors did an excellent job controlling the drills and the range was controlled in a safe manner. Additionally, the inspector observed a segment of the required annual weapons requalification training, which included weapons familiarization. Based on observations, the inspector determined that the training satisfied the requirements of the training and qualification plan.

Several security force members were interviewed to determine if they possessed the requisite knowledge to carry out their assigned duties. The results indicated that the individuals interviewed were knowledgeable about how to perform their job requirements. Additionally, throughout the inspection, the inspector observed security force members performing their duties in a professional manner and in accordance with applicable security procedures and post orders.

5.2.9 Inadequate Scheduling of Fitness-for-Duty Testing (Violation 50-334/95-09-02 and 50-412/95-09-02) (Closed)

During NRC Inspection 95-09, the inspector found that the licensee failed to implement unannounced fitness-for-duty testing in a statistically random and unpredictable manner so that all persons in the population subject to testing have an equal probability of being selected and tested and, as a minimum, tests are administered on a nominal weekly frequency and at various times during the day.

A review of the licensee's corrective actions by the inspector verified that they were effective. The corrective actions included revising collection staff work schedules so that random testing would satisfy the intent of the fitness-for-duty rule. A review of testing documentation by the inspector, revealed that since the last inspection conducted in April 1995, backshift, weekend, and holiday testing is being performed as required. No deficiencies were noted.

5.3 Housekeeping

Plant housekeeping controls were monitored, including control and storage of flammable material and other potential safety hazards. The inspectors conducted detailed walkdowns of accessible areas of both Unit 1 and Unit 2. Housekeeping at both units was acceptable.

6.0 SAFETY ASSESSMENT AND QUALITY VERIFICATION (71707, 62703, 61726, 37551, 71750)

6.1 Unit 1 Basis for Continued Operation with Unqualified Breakers (Unresolved Item 334/95-07-01) (Closed)

Unresolved Item 334/95-07-01 was opened because the licensee had not adequately justified operation with unqualified feeder breakers to the Unit 1 inadequate core cooling monitors (ICCMs). The licensee revised the justification in April 1995, subsequent to the identification of the unresolved item, in an attempt to provide documentation of reasonable assurance that the breakers would perform their design function. This was primarily through reference to a seismic test report for the breaker panel. The new documentation did not, however, evaluate the breaker electrical characteristics, or compare the installed breakers with the breakers used during the seismic test of the breaker panel. The shortcomings in the new documentation were discussed with the licensee, and were finally addressed on August 11, 1995. The additional documentation, completed on August 11, included: (1) A thorough evaluation of the installed breaker configuration against the seismic test configuration to ensure that the test conditions enveloped the actual operating configuration. (2) Reasonable assurance from the breaker manufacturer that the tested breakers were manufactured and processed in the same manner as the installed breakers. (3) Full load and 200% load test data on the installed breakers.

Based on review of the August 11, 1995 documentation, the inspectors concluded that the licensee provided reasonable assurance that the ICCM feeder breakers would perform their design function. This unresolved item is closed.

6.2 Failure to Promptly Identify and Correct Adverse Conditions in the Unit 1 River Water System (Violation 334/95-09-01) (Closed)

This violation was issued on June 23, 1995, due to failures by the licensee: (1) to appropriately monitor for clogging of the river water supply strainers for the high head safety injection (HHSI) pumps and the control room cooling units; and (2) to adequately address erosion problems with the Unit 1 HHSI pump oil coolers. The licensee responded to the violation on July 24, and discussed corrective actions that included: (1) an evaluation of heat exchangers at both units to identify the potential for flow induced erosion problems; (2) establishing a requirement to evaluate heat exchangers for erosion any time they are open for maintenance; (3) a review of currently open engineering memoranda (EMs); (4) revised performance indicators to better evaluate the completion status of EMs; (5) a review of all operating logs for outstanding items identifying the need to establish operating limits; (6)

operator briefings on maintaining a questioning attitude; and (7) a review of safety significant maintenance work requests (MWRs).

During the evaluation of heat exchangers for flow induced erosion potential, two additional types of safety related heat exchanges were identified as possible problems: (1) the Unit 2 emergency diesel generator (EDG) jacket water heat exchangers; and (2) the Unit 2 safeguards area air conditioning units. The EDG heat exchangers have minimal in-service time and were inspected during the last outage. The inspections did not identify any signs of degradation. Consequently, the erosion concern for these heat exchangers was not significant. The licensee will continue to monitor these heat exchangers to establish an erosion rate. The safeguards area coolers were a much greater concern because they are always in service. As a short term action, the licensee throttled flow to these heat exchangers, with appropriate engineering analysis, to a point that minimizes additional erosion concerns. During the next refueling outage, the licensee plans to replace the safeguards area coolers with more erosion resistant material.

The licensee's reviews of EMs, MWRs, and operating logs did not result in any safety significant findings; however, some priorities and due dates were adjusted to be more consistent with significance. The inspectors independently reviewed the licensee's outstanding MWRs and also did not identify any safety significant issues (see Section 3.1.1 of Inspection Report Numbers 334/95-16 and 412/95-16). The inspectors concluded that the licensee's corrective actions for this violation were appropriate. This violation is closed.

7.0 ADMINISTRATIVE

7.1 Preliminary Inspection Findings Exit

At periodic intervals during this inspection, meetings were held with senior plant management to discuss licensee activities and inspector areas of concern. Preliminary inspection finding exits were held on October 13, November 9, and December 8 by P. Bissett, E. King, and R. Fuhrmeister in the areas of operator requalification examinations, security, and SSFI self-assessment. Following conclusion of the report period, the resident inspector staff conducted an exit meeting on December 8, 1995, with Beaver Valley management summarizing inspection activity and findings for this period.

7.2 NRC Staff Activities

Inspections were conducted on both normal and backshift hours: 12.5 hours of direct inspection were conducted on backshift; 15 hours were conducted on deep backshift. The times of backshift hours were adjusted weekly to assure randomness.