U.S. NUCLEAR REGULATORY COMMISSION

REGION I

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION REPORT NO. 50-354/85-99

PUBLIC SERVICE ELECTRIC AND GAS CORPORATION

HOPE CREEK GENERATING STATION

ASSESSMENT PERIOD: NOVEMBER 1, 1984 TO OCTOBER 31, 1985

BOARD MEETING DATE: JANUARY 16, 1986

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I. Introduction

A. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect available observations and data on a periodic basis, and to evaluate licensee performance based upon this information. SALP is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. It is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources, and to provide meaningful guidance to licensee management to promote quality and safety of plant operation.

An NRC SALP Board, composed of the staff members listed below, met on January 16, 1986 to review the collection of performance observations and data to assess the licensee performance in accordance with the guidance in NRC Manual Chapter 0516, "Systematic Assessment of Licensee Performance." A summary of the guidance and evaluation criteria is provided in Section II of this report.

This report is the SALP Board's assessment of the licensee's safety performance at Hope Creek Generating Station for the period November 1, 1984 through October 31, 1985.

B. SALP Board

Chairman:

R. W. Starostecki, Director, Division of Reactor Projects (DRP)

Members:

H. Kister, Chief, Projects Branch No. 1, DRP
L. Bettenhausen, Chief, Operations Branch, DRS
R. Bellamy, Chief, Emergency Preparedness and Radiological Protection Branch, DRSS (Part time)
J. Joyner, Chief, Nuclear Materials Safety and Safeguards Branch, DRSS
E. Adensam, Director, BWR Project Directorate #3
J. Strosnider, Chief, Reactor Projects Section 1B, DRP
R. Blough, Chief, Reactor Projects Section 1A, DRP
D. Wagner, Licensing Project Manager, NRR

C. Background

1. Licensee Activities

At the beginning of the SALP Assessment period the facility construction was approximately 92% complete. Preliminary and preoperational testing were in progress. Preliminary testing culminated in the Integrated System Flush in February and the Reactor Pressure Vessel

Hydrostatic Test in early March. At the end of the period facility construction was essentially complete with the exception of the plant radiation monitoring system, radwaste systems, and some HVAC systems, and completion of miscellaneous construction activities and clean up. Preoperational testing was estimated 32% complete.

Significant activities that occurred during this assessment period include an Independent Design Verification Program conducted during April through June, initial cold license operator exams conducted in July, receipt of new fuel on site during September and October, and an initial Hope Creek Emergency Plan exercise on October 29, 1985.

A reorganization of the PSE&G Nuclear Department was implemented on July 1, 1985. This reorganization was in accordance with the applicant's Transition Plan for switching from Construction Phase to Operations.

2. Inspection Activities

An operations senior resident inspector was assigned to the Hope Creek Generating Station for the entire assessment period, and a construction senior resident inspector was assigned until Mid-September. The total NRC inspection effort for the period was 5462 hours (resident and region-based), with a distribution in the appraisal functional areas as shown in Table 1. A resident-inspector-in-training was assigned to the site beginning in April. During the assessment period, NRC team inspections were conducted to examine the following areas:

a. Radiation Protection Program
b. Chemistry Program
c. Radioactive Waste Disposal Program
d. Reactor Coolant System Hydrostatic Test
e. Emergency Lighting and Safe Shutdown Capability in the event of a fire
f. Independent Design Verification Program followup by IE Headquarters
g. Emergency Preparedness Program
h. Readiness to Receive Fuel

Tabulations of Inspection Activities and Violations are presented in Tables 2 and 3, respectively.

II. Criteria

Licensee performance has been assessed in selected functional areas. Each functional area is significant to nuclear safety and the environment, and is a normal programmatic area.

One or more of the following evaluation criteria were used to assess each functional area.

1. Management involvement and control in assuring quality

2. Approach to resolution of technical issues from a safety standpoint

3. Responsiveness to NRC initiatives

4. Enforcement history

5. Reporting and analysis of reportable events

6. Staffing (including management)

7. Training and qualification effectiveness

Based upon the SALP Board assessment each functional area evaluated has been classified into one of three performance categories. The definitions of these performance categories are:

Category 1. Reduced NRC attention may be appropriate. Licensee management attention and involvement are aggressive and oriented toward nuclear safety; licensee resources are ample and effectively used so that a high level of performance with respect to operational safety is being achieved.

Category 2. NRC attention should be maintained at normal levels. Licensee management attention and involvement are evident and are concerned with nuclear safety; licensee resources are adequate and reasonably effective so that satisfactory performance with respect to operational safety is being achieved.

Category 3. Both NRC and licensee attention should be increased. Licensee management attention or involvement is acceptable and considers nuclear safety, but weaknesses are evident; licensee resources appear to be strained or not effectively used so that minimally satisfactory performance with respect to operational safety is being achieved.

The SALP Board also assessed each functional area to compare the licensee's performance during the last quarter of the assessment period to that during the entire period in order to determine the recent trend for each functional area. The trend categories used by the SALP Board are as follows:

Improving: Licensee performance has generally improved over the last quarter of the current SALP assessment period.

Consistent: Licensee performance has remained essentially constant over the last quarter of the current SALP assessment period.

Declining: Licensee performance has generally declined over the last quarter of the current SALP assessment period.

III. Summary of Results

A. Overall Facility Evaluation

The applicant's performance was satisfactory in all areas. Project personnel displayed a positive attitude towards assuring quality construction by the crafts. Use of quality assurance oversight and feedback to management has resulted in quality construction. There was good management involvement in all areas, and areas requiring improvement were generally aggressively pursued.

Construction management maintained a positive attitude, was appropriately involved in resolving issues, and used a variety of approaches to maintaining quality awareness among workers. Areas needing improvement include (1) housekeeping, which has generally lagged other areas of progress, and (2) communications and interfaces among various groups having responsibilities for electrical and I&C activities.

The preoperational testing function is well-staffed with experienced personnel. The Code Hydrostatic Test was especially well-controlled. Nonetheless, some problems have been noted in procedure scope and review. Procedureal adherence and test control have been generally very good, but have varied depending on personnel involved. In preparing for fuel load and testing there needs to be adequate attention given by management to reviewing test results and identifying and correcting potential problems that could affect power ascension operations.

The applicant's planning for plant transition from construction to operations has been generally thorough and effective. The plant organization's involvement in construction completion, turnover, and testing has been noteworthy. Some transition problems that occurred in the preventive maintenance area have been corrected. The applicant has a good management philosophy regarding safe operation and strong administrative controls. Plant staffing, personnel qualifications, and training are generally quite good. However, vacancies and transfers occurred in the radiological controls area and may have contributed to a lack of attention to technical detail in the programs.

The assessments presented in this report are based largely on review of program plans; not implementation. Implementation of these programs will be carefully monitored in future inspections. Due to the state of transition from construction to testing and operational readiness near the end of this assessment period performance trends were not assigned in most functional areas.

B. Facility Performance

Functional Area	Category Last Period	Category This Period	Recent Trend
Construction Activities	1/2*	1	Consistent
Electrical and I&C Construction	2	2	NA**
Quality Assurance	1	1	Consistent
Preoperational Testing	2	2	NA**
Operational Readiness	Not evaluated	1	NA**
Maintenance	Not evaluated	2	NA**
Radiological Controls	Not evaluated	2	NA**
Security and Safeguards	Not evaluated	1	NA**
Emergency Preparedness	Not evaluated	2	NA**
Licensing Activities	2	2	NA**

*This Functional area includes four areas addressed separately in the last SALP. In that SALP three areas were Category 1 and one was Category 2.

**No trend is assigned in these areas since applicant effort during the period focused primarily on program development and there was insufficient opportunity for observation and evaluation of implementation to determine performance trend.

IV PERFORMANCE ANALYSIS

A. Construction Activities (24.4%, 1522 hours)*

1. Analysis

Construction activity decreased during this assessment period as the project neared completion. Therefore, to provide a meaningful assessment, some areas addressed separately in previous SALPs are addressed collectively here. This SALP area covers overall construction project management and control, as well as most individual construction disciplines. Electrical and I&C construction is addressed in a separate functional areas because it was the area of greatest construction activity and was an area of poorer performance.

Overall construction management continued to be strong during this assessment period. The utility and architect engineer's staff were knowledgeable of plant status and were appropriately involved in resolving technical issues and in ensuring quality. Senior utility and architect-engineer management were frequently observed on-site and in the plant.

Construction management maintained a positive, quality conscious attitude and a policy and practice of being generally receptive to quality concerns. In this regard, the applicant formed an independent group, SAFETEAM, to encourage and draw out expressions of any quality concerns among project personnel. This organization did not operate in a passive mode but rather actively solicited concern from present and past employees. This was accomplished through periodic interviews with current non-manual employees, group exits for manual employees, required interviews for leaving non-manual employees, and letters sent to previous employees not interviewed.

Communication of overall project status information from management was generally strong and effective; previous initiatives in this area, such as newsletters, posters, bulletin boards, and meetings, were continued during this assessment period.

Management and supervision were not fully successful in fostering within the project a high degree of pride in plant appearance and of attention to detail in protecting plant equipment from damage. Examples of problems were debris found in cable trays and the leaking of fire barrier sealant material onto plant equipment. Housekeeping improved during the assessment period, but the progress was not consistent and generally lagged behind other aspects of plant completion and transition. Also,

*Numbers in parenthesis represent the percentage and absolute number, respectively, of inspection hours expended in each functional area.

there were some cases, where preventive maintenance (PM) on in-plant equipment still under construction was not fully effective. These problems were exceptions to a generally effective construction PM program and, once identified, were properly addressed.

The applicant's QA group followed up on NRC open items, tracking each item to resolution. The various technical groups have not always been timely in addressing the open issues, however, and some items remained open longer than necessary. A few items required repeated NRC re-inspection and additional licensee work to reach an acceptable resolution. Some IE Bulletins, IE Circulars, and TMI Action Plan items involving procedural controls were presented for NRC review before they were actually ready, in that the associated procedures were still in the applicant's review cycle.

Details of performance in individual construction disciplines are discussed below.

Piping Systems and Supports

During this period NRC inspections in this area focused on welding and pre-service and in-service inspection (PSI/ISI) activities.

An inspection using the NRC Mobile Nondestructive Examination Laboratory was conducted April 8 - May 3, 1985. This inspection involved review of licensee data packages and independent radiographic, magnetic particle liquid penetrant, visual and ultrasonic examination of selected welds in ASME Class 1, 2 and 3 systems. The results of this inspection indicated that the licensee's programs for welding and fabrication control were effective in assuring the quality of the plant system installations.

Another inspection reviewed the areas of welding, design and fabrication of small pipe and pipe support attachments. The inspection found that the licensee was actively involved in the resolution of materials related problems and other activities to control quality while extra efforts were being made to keep on schedule for turnover of systems for pre-operational testing. The licensee showed engineering conservatism in the solution of ASME Code Class 1 materials problems related to pipe attachments.

Preservice Inspection (PSI) activities were reviewed during the NRC NDE Van inspection and during five additional inspections. The inspections found that licensee management involvement and control was amply evidenced by the almost constant QA surveillance of vendor PSI activities.

Additionally, the licensee has been actively involved in the demonstration of ultrasonic examination techniques for piping containing corrosion resistant cladding (CRC). Potential problems with these

examinations were identified to the licensee by the NRC, and since that time the licensee has been actively engaged in a research and development program to design a viable method for performing a meaningful examination of the material. Demonstrations on 12", 22" and 28" diameter material were successfully performed.

The licensee's staff, and the PSI vendor's personnel have been found competent and have shown evidence of effective training in this area. Staffing at the plant has been adequate for the activities in progress. The licensee's Q.A. group has reviewed records to assure that the PSI vendor personnel involved with the mechanized ultrasonic RPV weld examinations were trained and qualified in the set up and operation of the mechanized equipment. Additionally, the QA staff performed periodic audit of the PSI vendor activities to assure that those activities were performed in accordance with applicable requirements.

One exception to the above favorable findings was the licensee's removal from the ISI program of two welds in the HPCI system. The short distance between these welds prohibited effective PSI/ISI ultrasonic testing. Thus these welds were removed from PSI/ISI program and replaced with two similar category welds. However, the licensee did not provide a thorough technical evaluation of the actual piping configuration to assure that the HPCI system reliability would not be degraded over a period of extended use. This item required repeated NRC attention to obtain an acceptable degree of evaluation.

Safety Related Components

Inspections were conducted in this functional area involving the reactor pressure vessel (RPV) and preventive maintenance during construction.

The reactor vessel internals installation was performed and controlled by General Electric Company. The GE construction personnel were experienced, well trained, and effectively managed; the work was planned and controlled with necessary instructions and procedures. The end result was an RPV that has no weld draw beads in any of the internals. The smooth assembly process provided evidence of good planning and management of this construction activity. One problem was identified in this area, in that three of the RPV top flange threaded stud holes were observed to be rusted, with resultant thread metal loss.

However, in general, management involvement during work on reactor vessel internals was adequate with considerable evidence of QC and QA activity by the contractor (General Electric), the architect engineer (Bechtel Construction) and the licensee.

Regarding preventive maintenance during construction, a problem was noted regarding failure to protect diesel generator heat exchangers

from static water accumulation and potential corrosion. Applicant response to this NRC identified problem was effective.

Support Systems (Fire Protection, HVAC)

A special inspection was conducted on May 20-24, 1985, to assess the plants ability to safely shut down in the event of a fire. In this area, the licensee has consistently exhibited evidence of prior planning by the presence of complete, timely and thorough audits, technically sound reviews and complete records of design. Further evidence of management's involvement is the thorough safe shut down analysis which was included in the licensee's FSAR. The licensee was responsive to NRC concerns as indicated by its quick resolution of issues identified during the team inspection.

Inspection of safety related HVAC ductwork and support installations, emphasized a review of hardware installation and review of technical and design documents. PSE&G management involvement was evident in various aspects of HVAC installations. Surveillance programs of site contractors were found to be timely and thorough. Bechtel site engineering was found to be knowledgeable and technically sound in addressing most of the concerns raised during the inspection. Some unresolved items were identified related to justification for, and qualification of tolerances in Duct Standard Support Criteria. However there was no indication of a recurrence of previous problems with subcontractor QC and, in general, good control over site activities related to HVAC installations was observed.

2. Conclusion

Rating: Category 1

Trend: Consistent

3. Board Recommendations

Licensee: Complete prompt closure of outstanding open items.

NRC: None

B. Electrical and I&C Construction (8.7%, 542 hours)

1. Analysis

This area is addressed separately in the SALP because there was extensive construction work activity in this area during the period and also because applicant performance in this area was not as strong or as consistent as in other construction disciplines. Eight inspections were conducted in this area, five primarily in electrical, and three primarily in I&C.

Major jobs appeared well-planned and the major technical aspects were accomplished properly. Cable runs and instrument tubing were generally neat and adequately supported. However, the degree of attention to detail was less than in other areas. As a consequence, lapses occurred in construction performance and in protection of in-plant installed electrical equipment, instruments and instrument tubing. Some examples of these lapses include two examples of improper cable installation (Inspection 84-21), uncapped instrument tube ends (Inspections 85-03 and 85-51) and trash and debris accumulation in cable trays (Inspection 85-10).

Problems were noted involving communications and interfaces among the various groups having responsibilities for aspects of equipment design, installation, maintenance, and inspection. Examples of these problems include:

-- Confusion over PM responsibility for equipment released for test (RFT) resulted in removal of space heating from sixteen electrical components (Inspection 84-21).

-- There was confusion among construction and start-up personnel regarding QC involvement in the RFT program (Inspection 85-03).

-- Systems were accepted by QC and released for test with instruments which the vendor had previously indicated would need replacement. There was no apparent method of tracking the item being replaced in the QC document or the turnover package.

-- Construction activities, access controls, and preventive maintenance were not well-coordinated in certain plant areas having safety related electrical power supply and distribution equipment (Inspection 85-17).

-- Class IE Unit Substation logic design was not properly translated into drawings. Further, an opportunity to identify the deficiency during testing was missed due to

insufficient involvement of engineering personnel (Inspection 85-42).

-- Cable tie-ups were not reinstalled or reinspected after removal to facilitate fire seal installation (Inspection 85-45).

The above noted problems indicate that more effective direct supervision of in-plant activities and better coordination among various organizations could have improved overall performance.

The licensee was generally aggressive and reasonably thorough in addressing issues, both those identified by NRC and those self-identified. Corrective actions typically included consideration of potential for generic implications or more widespread examples of a noted deficiency. Seven construction deficiencies were reported in this area. As indicated in Section A, construction deficiencies were evaluated appropriately and corrective actions were usually thorough and technically sound.

Considerable management attention and technical resources were focused on evaluation and correction of various design problems with the Bailey low voltage control system. Although it appears preliminarily that significant improvements have been made, NRC review of the system is not yet complete.

The applicant was very responsive to an NRC concern involving control of instrument calibration data (ICD) and setpoint calculations. The applicant established a program to verify all calibration and setpoint data and has also been active in an owner's group to refine setpoint methodology. Further, a computer based index was developed that can cross-reference any revision to a reference document to each potentially-affected ICD card, so that calibration data and setpoint information can be kept up-to-date.

Although the licensee was generally thorough and aggressive in addressing problems in this area, particular emphasis should be placed on identifying possible electrical and I&C problems during test results review.

2. Conclusion

Rating: Category 2

Trend: NA

3. Board Recommendations

Licensee:

Increase attention to electrical and I&C equipment during facility turnover and plant walkdowns.

Improve in-plant supervision of ongoing activities to ensure proper care and respect is being given to installed equipment.

Be particularly sensitive during test results review to identification of problems possibly resulting from electrical and I&C areas.

NRC:

Include discussion of the root causes of problems in this area and possible future implications as part of the SALP Management meeting.

C. Quality Assurance (9.1%, 569 hours)

1. Analysis

Five inspections were conducted by NRC QA specialists to review preoperational and operational phase QA programs. Further, numerous other NRC inspections involved review of QA/QC program effectiveness as it relates to construction, turnover, preoperational testing, operational readiness, security and safeguards, radioactive controls, emergency planning, and other functional areas. Because QA effectiveness influences all functional areas, it is discussed in various other sections of the report, as well as being addressed separately here.

Both the applicant and the architect-engineer have maintained strong QA programs; this has had a beneficial impact on project quality. Project management has demonstrated a support of QA. The various project communications mechanisms, (mentioned in Functional Area A, Construction) contain frequent discussions, reminders, and features designed to promote quality goals.

In accordance with the applicant's approved transition plan, the QA organization evolved and functional responsibilities were transferred between groups based on project activities and needs. Staffing of the QA/QC groups was fully adequate throughout the period, as the applicant shifted resources appropriately from construction oversight to preoperational testing and operational readiness activities. Transfer of functions went smoothly with no apparent losses of effectiveness in transition. The transition reflected well on the management's planning efforts and evaluations of the evolving needs of the QA program. QA audits and surveillance were found to be comprehensive and well-scheduled. For example, audits of operational readiness were especially comprehensive and timely. In contrast, however, the QA audit process was apparently not used to ensure the readiness of the Emergency Preparedness area for NRC appraisal.

The applicant and architect-engineer focussed management attention on correcting deficiency weaknesses noted in the past. Cases of unauthorized rework were dealt with forcefully, although the project was not able to entirely eliminate the problem. For example, several cases of unauthorized rework of fire barrier penetration seals were identified (by the architect-engineer QA organization) early in 1985. Similarly, cases of bypassing of QC hold points continued to trend downward, and individual instances were thoroughly investigated.

The applicant was generally responsive and thorough in responding to quality concerns and findings, regardless of the source.

The applicant responded quickly and effectively to NRC-identified QC concerns from late in the last SALP period involving clarification of QC inspection procedures and records.

Although a few exceptions were noted, the applicant's corrective actions typically involve measures to determine the full scope of the problem (i.e., to find out if there are additional deficiencies similar to the ones cited) and to identify and correct the root causes.

Despite an overall strong QA program, during the early part of the assessment period the QA construction and preoperational QA program were not comprehensive enough to identify and correct concerns identified by the NRC and discussed in the corresponding sections of this report in the electrical, I&C, and preventive maintenance areas. NRC also identified repeated problems in documentation of preoperational test equipment accountability and usage. Recently, the licensee management and QA staff have taken effective corrective actions to adequately address the NRC-identified deficiencies. Actions included procedure revisions, improved definition of interfaces, and associated interface meetings. This improvement in the applicant's programs was verified during NRC Inspection 85-51.

Inspections thus far of operational QA programs have indicated proper planning, management involvement, and commitment to QA.

2. Conclusion

Rating: Category 1

Trend: Consistent

3. Board Recommendation

Licnesee: None

NRC: None

D. Preoperational Testing (29.3%, 1822 hours)

1. Analysis

During this assessment period twelve inspections of preoperational testing activities, which included one initial review of the applicant's startup program, were performed by region-based inspectors. The resident inspectors also reviewed the area extensively.

The licensee has developed a well-defined and administratively adequate preoperational test program. Based on inspector observations the applicant appears to be well staffed with qualified system test engineers. Management personnel are involved in program activities and appear to be vigorously pursuing an expedited preoperational test program.

There have been weaknesses identified in the area of test procedure scope content and level of review. During the early phase of the preoperational test program only "Q" category procedures received Preoperational Review Committee (PORC) review and approval. NRC review determined that numerous systems listed in Regulatory Guide (RG) 1.68 were not classified as "Q" by the applicant. The applicant has revised his program to include review of all results of preoperational tests identified in RG 1.68 by PORC.

An additional weakness concerning the emergency diesel generator preoperational test procedure scope was identified during a February 1985 inspection. The PORC approved procedure did not satisfy the intent of RG 1.108 concerning ECCS load sequencing after the 24 hour full load run. Several other minor instances have been identified where FSAR commitments had been omitted from preoperational test procedures. Also some of the early tests required an excessive number of changes during test performance to make them workable. As a result of the above, the licensee has taken positive steps to ensure that FSAR and Regulatory Guide commitments are not overlooked by establishing the Test Review Board (TRB) which performs an in-depth review of preoperational test procedures (PTP) prior to PORC review and approval. Although this procedure reduced the number of NRC comments relating to procedure review, NRC inspection in July 1985 found in three instances where procedures did not meet FSAR commitments. The deficiencies were relatively minor, however, and the general trend of procedure quality is improving.

A compressed work schedule has contributed to premature acceptance of plant systems early in the period by the startup group. Many systems have been accepted from construction (201 of 210 plant systems as of October 16, 1985) with too many open

deficiencies to allow testing (48 of 149 PTPs had been field completed as of October 16, 1985). One example of this problem involved the diesel generators which were scheduled to begin testing early in 1985. At that time, vendor testing had not begun and diesel preoperational testing actually began in October 1985. Sequencing of many other tests was changed based on equipment availability. Also in an attempt to support a compressed test schedule (1) FSAR test commitments were often shifted from one test to another, and (2) some systems (e.g., HPCI, RCIC) were preoperationally tested with significant modifications pending. These actions increase the potential for either missing test requirements or invalidating completed tests. Therefore, increased applicant attention is warranted in the areas of test results review, modification sequencing, and post-modification testing. This need for special applicant attention is further underscored by the fact that a large number of FSAR changes have been made during the preoperational phase, due to (1) initially too general test commitments, and (2) design changes.

NRC inspection of the Local Leak Rate Testing (LLRT) program indicated that the licensee had developed and implemented a well planned and thorough program that will meet the requirements of 10 CFR 50 Appendix J if followed.

One special NRC inspection covered the ASME Code Hydrostatic test of the reactor pressure vessel and associated piping. This test was executed in an especially effective and satisfactory manner. The applicant demonstrated complete involvement with this test. The fact that management considered this test to be an extremely important milestone in the plant's construction was evident throughout the test. Management and staff personnel exhibited high levels of technical competence, a cautious conservative approach, and systematic planning, training, and control of the event. Also, the documentation and records of these tests were quite complete and well-organized.

Procedural adherence and test controls have been generally very good, but have been somewhat dependent on the individual test engineers. Most procedural adherence deficiencies noted have been administrative in nature, such as improper handling of changes or failure to fully review prerequisites. One area of repeated problems is documentation of test equipment account ability and usage. This problem was originally identified by NRC, but repeated examples of lack of attention to detail were subsequently noted by both the applicant's QA group and NRC. Since the applicant's program provides multiple means of tracing equipment usage, the adherence problems have not jeopardized test validity.

Preparations for the startup test program are well underway. Planned staffing levels appear adequate. The startup organization is drawing experienced personnel from various sources and has been gathering information and lessons learned from other recent BWR startup test programs. Because of the limited opportunity for evaluation, thus far, startup testing is not considered in determining the rating for this functional area.

Throughout this period QA/QC has been actively involved with the preoperational testing program through both procedure review and surveillance of activities. The QA manager has also assigned a QA engineer to track and expedite closure of all NRC open items.

In summary, the dynamic test schedule, the shifting of commitments among tests, and the tempo of design and FSAR changes dictate an especially thorough final review of the tests to verify they are valid, meet all commitments, and have gathered all the necessary data. In addition, modifications in progress must be carefully reviewed to make sure they don't negate previous test results.

2. Conclusion

Rating: 2

Trend: NA

3. Board Recommendations

Licensee:

Be especially thorough in review of results of individual tests and of the overall program.

Ensure that modifications and shifting of test commitments don't negate completed test results.

NRC: None

E. Operational Readiness (13.0%, 809 hours)

1. Analysis

A special team inspection reviewed the applicant's readiness to receive, inspect, handle, and store new fuel. Also, operational readiness in the areas of design control, records program, and measuring and test equipment (M&TE) control was reviewed in two inspections. Operator licensing examinations were conducted in July and October 1985. The resident inspectors also reviewed various aspects of operational readiness.

The applicant developed a planned, methodical approach to the transition from construction to operations. A formal Transition Plan was in effect throughout the period. As the preoperational phase began, Hope Creek Operations developed an Operational Readiness Plan to identify and track to completion major operational readiness activities. Tracking systems and management information systems were used effectively in the areas of staffing, procedure development, procurement, and training.

The details and extent of planning for the transition from a construction oriented to an operations organization indicated that management exerted considerable analysis and effort to assure smooth transition and a high level of readiness to safely operate the plant.

The applicant has staffed the plant using experienced, well-qualified personnel. Although many of these were previous company employees, the applicant supplemented this talent by hiring experienced personnel from throughout the nuclear industry. Those hired were assigned to the staff sufficiently early to be involved in preoperation phase activities and in operations phase program development. Thus, depth and scope of personnel resources has been obtained. In terms of numbers of personnel, the applicant has been relatively successful in filling technical, administrative, and craftsman positions on-site. (One exception is the radiological controls area, discussed in Section G.)

During the appraisal period staffing appeared adequate. After the transition to operations, certain areas; such as I&C, reactor engineering, and shift administrative support; will have to be monitored closely during initial operation to determine if staffing matches the workload.

Hope Creek Operations has been appropriately involved in construction completion, turnover, and preoperational test activities. The operating shifts have been manned for two years, and shift supervision displays good control over operations and maintenance of turned over equipment. Plant management is

knowledgeable and fully involved; managers and supervisors appear to spend an appropriate amount of time in the plant.

Licensed operator and senior operator selection and training appears quite effective. On-shift personnel have shown a good attitude, a good safety perspective and a high level of motivation and initiative. Further, the operator training program was well-organized and made good use of the plant-specific simulator and the symptom-based emergency operating procedures. License candidates showed very good plant knowledge during NRC-administered license examinations. Nineteen of 24 senior reactor operator candidates and 14 of 16 reactor operator candidates were successful in their NRC cold license exams during this assessment period. This is a relatively high success rate and reflects well on the applicant's selection and training program.

In the area of administrative and procedural controls, significant NRC review remains to be done, so there is not a strong basis for evaluation. Preliminarily, it appears that the applicant has a good philosophy of providing strong controls. Significant management involvement and technical evaluation has been evident relative to establishing strong administrative controls that enforce good engineering and operating practice. Some administrative procedures appear somewhat unwieldy, however, and some inconsistencies among procedures were found. For example, procedures were inconsistent regarding scope of independent verifications under TMI Action Plan Item I.C.6. Regarding emergency operating procedures (EOPs), very extensive technical and human factors effort, which included significant operations management input, was expended in developing, verifying and refining the procedures. This shows management recognition of the importance of the EOPs and proper attention to their adequacy. Other operating and test procedures were somewhat late, relative to FSAR commitments, in being reviewed and approved. When the procedure review process fell behind, management attention was focused on recovering and ensuring procedures would be ready in time to allow for training and familiarization.

Although additional inspection is needed to fully verify the adequacy of the operational phase QA program, initial indications are favorable. Specifically, the operations phase programs for procurement control, receiving, storage and handling of materials and equipment, document control, maintenance, instrumentation and control and surveillance test programs was found acceptable. This is further evidence of proper planning, management involvement, and project commitment to QA. One area of development requiring management attention is the safety review process. The offsite groups had not been fully staffed, and the onsite safety review process was not fully operational as of the time of the NRC QA inspection in July 1985. Safety

review processes need to be in-place, well-understood, and functioning smoothly and effectively for the operational phase.

During an inspection of readiness for fuel receipt, several minor discrepancies were noted with fire protection procedures. Licensee management took immediate action during a scheduled site Operations Review Committee (SORC) meeting to review, discuss and correct the deficiencies. NRC review of other operating and test procedures is pending.

The applicant has a good program for reviewing, evaluating and tracking industry experience information from various sources, including NRC, INPO, and vendors. The review program has a full-time coordinator and provides for multi-discipline review. Although the reviews are usually thorough, there has been some tendency to rely too heavily on the vendor's or architect engineer's resolution, which is usually hardware-oriented and might not include appropriate procedural or administrative control features. Examples include IE Bulletins 79-24 (Freeze Protection) and 80-16 (Rosemount Transmitter Over-ranging).

During the readiness to receive fuel inspection, the inspectors found that the licensee was well prepared with a fully developed program for fuel receipt. However, the licensee's experiences during this program also indicated an example of possible schedule pressure, in that fuel was to be stored dry because all systems required for wet storage were not ready.

2. Conclusion

Category: 1

Trend: NA

3. Board Recommendations

Licensee:

Prepare an operational readiness presentation, based on self appraisal, for NRC Region I management approximately two weeks prior to projectd fuel load.

NRC:

Monitor adequacy of staffing in I&C, reactor engineering, and shift administrative support.

F. Maintenance (2.3%, 143 hours)

1. Analysis

The applicant's maintenance organization was extensively involved in preventive and corrective maintenance of in-plant equipment throughout the assessment period. Maintenance responsibility shifted to the Hope Creek Operations (HCO) maintenance group on a system-by-system basis at Time of System Turnover from construction to Start-up. Four specialist inspections observed licensee activities related to preventive maintenance (PM); also resident inspections and pre-operational test specialist inspections frequently spot-checked maintenance activities. Additional programmatic inspections are planned before licensing.

The HCO Maintenance Department is well-staffed with experienced supervisors and managers. Many of the supervisors have 15 or more years of applicable experience. The department manager was the project Construction Manager for several years before joining the plant operations staff. A conscientious and quality-conscious attitude exists throughout the staff, including the craftsmen.

Exterior resources, including an impressive training facility, are devoted to craftsmen training program. Also, a documented on-site job qualification program is in place. The training of maintenance personnel involved in fuel receipt was very effective. Further, the applicant has been alert during the preoperational phase to optimize the training benefit of corrective maintenance activities that occurred. As a result of the experience gained, some operations phase maintenance will probably be done more efficiently, and therefore, with less radiation exposure.

Despite the generally impressive personnel resources and training program, a number of maintenance-related problems have occurred, most of which involved turnover and transition. Examples follow:

-- Some electrical equipment was without required space heat temporarily (see functional area B, Electrical and I&C);

-- A backlog of preventive maintenance requests (PMs) on recently turned-on equipment developed;

-- Some Hope Creek maintenance craftsmen appeared unfamiliar with Bechtel PM procedures, which they were required to perform during PM program transitions;

-- Many Limitorque motor operated valve actuators were greased with the wrong grease, resulting in a Construction Deficiency Report and extensive rework.

The above noted problems indicate that:

(1) There were lapses in interface and coordination between the construction and operations organizations, as related to the specfics of equipment maintenance during the transition phase,
(2) Some job-specific training and on the job supervision was not fully effective, and
(3) The HCO PM program may not have been adequately prepared for some system turnovers.

Most of the above listed problems occurred early in the assessment period. The applicant was aggressive in correcting identified problems and using lessons learned. For example, the PM backlog was reduced to minimum later in the assessment period. The applicant has shown a strong commitment to PM. Although some problems appear to have been related to unique aspects of transition, similar interface and coordination problems can occur during modification work in the operations phase; therefore the applicant should make sure any such problems have been fully resolved.

One activity occurring late in the assessment period was performed in an especially safe and professional manner. This was the receipt, handling, inspection, and storage of new fuel, conducted by maintenance personnel. This job went smoothly and was very well supervised. Supervisors and craftsmen were knowledgeable, alert, and meticulous.

Maintenance facilities are generally good and were functional before needed. One exception is the CRD rebuild facilities which are not well designed from an ALARA viewpoint.

Maintenance procedures have not been reviewed extensively by NRC. Of a sampling reviewed thus far, some were found to be very good, whereas others appeared in need of additional detail.

2. Conclusion:

Rating: 2

Trend: NA

3. Board Recommendations:

Applicant:

Ensure that interface and coordination problems identified in the maintenance area are fully resolved and will not cause problems during the operations phase.

NRC: None

G. Radiological Controls (4.7%, 295 hours)

1. Analysis

During this assessment period, initial reviews of the applicant's developing radiation protection and radioactive waste management programs were completed and the implementation of the segments of the radiation protection program needed to support fuel receipt was reviewed. No significant problems or deviations from previous commitments were noted during the reviews.

Radiation Protection

Four inspections in the radiation protection area were conducted by Region I Radiation Specialists. The inspections reviewed the development of the radiation protection program and its implementation during fuel receipt activities. Although a number of problems and weaknesses was identified, overall program development is considered adequate.

Early in the appraisal period reviews of the radiation protection organization and staffing indicated development of a generally adequate radiation protection organization. As a result of reorganization and merger of the chemistry and radiation protection organizations, the incumbent Radiation Protection Manager became the Chemistry/Radiation Protection Department Manager. Supervisory oversight and attention to technical detail in radiation protection program development was weakened during the preoperational period by the vacancy in the Radiation Protection Engineer position created by the reorganization. Staffing within the radiation protection function of the reorganized department was generally adequate. However, late in the assessment period, transfers and vacancies in radiation protection and radiological engineering supervision weakened supervisory oversight of operational radiation protection and radiological engineering.

The development of radiation protection procedures was generally adequate. Weaknesses and the need for technical improvement were noted in station administrative procedures describing the radiation protection program, providing control of access to radiologically controlled areas and the radiation work permit system. The applicant was responsive in addressing and correcting the weaknesses noted.

An inspection after the end of the assessment period confirmed a significant need for increased supervisory oversight and attention to technical detail in program and procedure development. (This inspection, having been completed after the end of the assessment period, is not considered in the SALP rating or included in statistical data and tables.)

Radioactive Waste Management/Effluent Monitoring

Two inspections of the radioactive waste management and effluent monitoring program were conducted by Regional Radiation Specialists during this assessment period. The inspections reviewed the development of the program area including planned organization and staffing, installation and testing of radioactive waste systems and monitors and development of test and operating procedures.

A generally adequate radioactive waste management organization was being developed. Positions were adequately identified but vacancies in supervisory positions were noted. Authorities and responsibilities were identified in administrative procedures but key responsibilities were divided between the Operations and Chemistry/Radiation Protection Departments. The procedures defining these interfaces were under development but incomplete during the assessment period. Operating personnel were being trained but had not been qualified on the systems which they were to operate.

This area appears to require more management attention and inter-departmental coordination to ensure (i) interfaces are properly defined and well-understood and (ii) training is completed and effective. As an example, an inappropriate Field Change resulted in the last valve in the gaseous radwaste system having an incorrect failure mode. This change was not questioned during the various, multi-discipline reviews during turnover. Improvements in both the areas mentioned above are needed in an appropriate time frame to support radwaste system operations.

Late in the assessment period, the applicant requested deferral beyond fuel load for installation and operability of certain process radiation monitors. The analysis provided to support the deferral request did not fully address potential situations and sources that could require monitoring. Technical issues associated with the deferral request remained unresolved at the close of the assessment period.

Defined procedures for tests of radioactive waste systems were being developed showing prior planning and assignment of priorities in that portion of the applicant's test program.

Acceptance criteria for the tests generally met previous commitments suggesting reviews were generally thorough and technically sound.

2. Conclusion

Rating: Category 2

Trend: NA

3. Board Recommendation

Applicant:

Complete staffing of supervisory positions within the radiation protection organization (especially the Radiation Protection Engineer position) and the radioactive waste management organization.

Ensure through well coordinated test procedures and plans that installation of deferred systems does not interfere with the performance and results of plant startup testing.

NRC: None

H. Security and Safeguards (1.0%, 59 hours)

1. Analysis

This assessment covers the licensee's performance in (1) developing and implementing a program for the receipt, on-site storage, control and accountability of special nuclear material (SNM) of low strategic significance, and (2) development of an operations phase physical protection program for Hope Creek.

Two preoperational security program reviews, including one inspection of implementation of security and other storage license requirements for new fuel, and one inspection of the licensee's program for control and accountability of SNM, were performed by regional-based physical security inspections. Routine review of program development was also conducted by the NRC inspectors.

During this assessment period, the licensee was highly effective in the development of the physical security program and its integration into the existing security program for Salem Units 1 and 2. Experienced gained through the licensee's security program at Salem Units 1 and 2 has been beneficial in establishing the Hope Creek security program. The licensee was engaged in modifying the existing security management staff, redesigning security procedures and orders and conducting complex acceptance testing of new security related systems. These modifications and testing of new systems were aggressively pursued and have had minimal impact on the operation of the Salem security program.

NRC review of the Hope Creek physical security plan and the plan for Receipt of Special Nuclear Material of Low Strategic Significant identified only a few issues which required rework by the licensee, which is indicative of management's attention to the preparation of the plans. Additionally, the licensee was found to be aggressive in pursuing resolution of outstanding issues identified during Region I preoperational program reviews. This is further evidence of management's commitment to develop and implement an effective program. At the end of the period the licensee was reviewing its Training and Qualification and Safeguards Contingency plans to identify necessary changes to those documents at an early stage. It is anticipated that only minor operational and administrative changes will be necessary. The NRC has found all security program plans to be professionally prepared, well organized and submitted in a timely manner. Changes necessitated as a result of NRC review were accomplished in a timely, professional, and cooperative manner, demonstrating the licensee's continued attention and responsiveness to regulatory requirements.

Appropriate involvement of both quality assurance and project personnel was evidence of management's interest in a quality program. Auditors were aggressive and conducted prompt followup on identified issues. Project engineers, responsible for the systems and equipment, and on-site security management personnel were found to be very knowledgeable of program status, testing schedules, turnover dates and NRC performance criteria. Preoperational security program reviews conducted by NRC indicated that the licensee's integrated security resources were ample, effective and well-defined, with attention to practical applications and lessons learned. This further demonstrated management attention to program needs at an early stage.

Security force personnel were found to be receiving adequate specialized training on the Hope Creek security equipment and systems. The training was being given by qualified personnel and was consistent with the requirements of the licensee's current NRC-approved Training and Qualification Plan. Security force personnel were observed by the NRC staff to have progressively improved their capabilities during this assessment period. Management involvement was evident by a relatively troublefree transition, to-date.

2. Conclusion

Rating: Category 1

Trend: NA

3. Board Recommendation

Applicant:

Fully implement operations phase security in sufficient time in advance of fuel load to identify and resolve any weaknesses.

NRC: None

I. Emergency Preparedness (7.5%, 467 hours)

1. Analysis

This assessment is based on the results of the Emergency Preparedness Implementation Appraisal (EPIA) performed on August 12-16, 1985 and on the NRC team inspection of the first Hope Creek emergency exercise on October 29, 1985.

An EPIA was performed at Hope Creek on August 12-16, 1985 to evaluate the overall adequacy and effectiveness of the emergency preparedness program. The appraisal findings indicate that the framework for the emergency planning (EP) program including administrative and organizational setup, training, procedures, and facility locations is established and appears to be adequate. However, several critical program areas were found to be incomplete. These include organization, communications, training, and physical facilities. Therefore, the NRC appraisal team was unable to make determination as to the adequacy of the program. These findings indicate that management attention was temporarily diverted from the development Hope Creek EP capabilities due to the focus on (i) upgrading Salem EP provisions, and (ii) corporate reorganization.

The applicant performed quite well during the October 29, 1985 emergency exercise with only minor deficiencies noted by the NRC inspection team. The applicant was not able, however, to demonstrate the effectiveness of certain program areas due to their incompleteness. In particular, personnel accountability and automatic transfer of Radiation Monitoring System (RMS) information to the dose assessment facilities were not demonstrated during the exercise. Nonetheless, significant progress in overall EP capabilities was made between mid-August and last October as evidenced by completion of the control room, technical support center, and off-site EP facilities; consolidation of the EP training program; and installation of a new telecommunications system. The applicant is aggressively pursuing resolution of these and the other program deficiencies noted by the EPIA appraisal team and the NRC exercise observation team. The impressive emergency exercise, combined with the aggressive approach to open items, indicate that management effectiveness is improving. Thus, while the above-noted diversion of attention away from plant-specific program development delayed implementation of some Hope Creek EP features, the applicant's generic upgrading of his organizational capabilities has improved the Hope Creek EP performance ability.
The applicant is keeping NRC Region I informed of progress made in those program areas which are to be completed and future inspections will not be conducted until the licensee has indicated that the EP program is substantially completed.

2. Conclusion

Rating: Category 2

Trend: NA

3. Board Recommendations

Applicant:

Consider performing a self appraisal of the Emergency Planning area.

Consolidate Emergency Planning efforts at Hope Creek and Salem.

NRC:

Defer future inspections in this area until the EP program is substantially completed.

J. Licensing Activities

1. Analysis

During the present rating period, the licensee's management demonstrated active participation in licensing activities and kept abreast of current and anticipated licensing actions. Management involvement is evident in the applicant's responses to staff concerns as most responses indicate awareness of policy, design and operational considerations.

During this rating period, the NRC staff performed numerous audits at the Hope Creek site, PSE&G corporate headquarters, and the Architect/Engineer's offices. In most instances, the appropriate level of PSE&G management was present at these audits to assure a smooth running review. The information provided by PSE&G at these audits was generally complete and thorough. One item the staff feels that PSE&G management should have been more involved in providing responses to is SER open Item I, "Riverborne Missiles." Responses to this issue did not fully address the staff's concerns and some of the assumptions used in the analyses were not adequately stated. The staff feels PSE&G management should have exhibited more control over his consultants on this item to ensure responses addressed the pertinent issues.

The applicant responded to numerous SER open and confirmatory items. Generally, PSE&G provided technically sound responses and displayed an adequate understanding of the technical issues to be resolved. The applicant has been quick to identify and propose resolution for technical issues of safety concerns which have been discovered in pre-operational testing. An example in this case is the applicant's identification of induced voltage problems with Bailey Solid State Control Modules. In this case the applicant identified and detailed the concern and discussed their proposed fix at an onsite meeting attended by Region I and NRR personnel. Similar aggressiveness has also been experienced in the applicant's resolution of preservice inspection of corrosion resistant clad piping.

The applicant has been responsive to NRC initiatives. Responses to NRC Generic Letters, where required, have been timely, generally sound and thorough. However, in this late stage of licensing, PSE&G owes the staff a significant amount of information to resolve all of the outstanding issues in support of a February 15, 1986 fuel load date.

In April 1985, PSE&G underwent a corporate reorganization. The staff reviewed this new organization during a two-day audit in July, 1985. The corporate organization is well defined on paper, positons are described in detail and authorities and

responsibilities are well defined. Key Management positions remain open and have been an SER Open Item for over a year now. The staff cannot resolve this issue until the positions are filled. The applicant should have been more aggressive in the filling of those positions.

In summary, a substantial licensing staff has been maintained to assure quality responses to NRC concerns. PSE&G management has exhibited involvement and control in Hope Creek licensing activities. PSE&G has provided technically sound and timely responses to SER open items and has displayed an adequate understanding of the technical issues to be resolved. The applicant has responded to NRC initiatives in a timely fashion; however, in light of the announced fuel load date of December 1, 1985, licensing issues were not being resolved at a satisfactory rate (for example, identification of system deferrals was sent in by letter dated November 29, 1985). PSE&G management has undergone a staff reorganization which resulted in positions with authority and responsibilities well defined. Still, key management positions have remained open for over a year. Management appears to be taking a more active role in licensing concerns.

2. Conclusion

Rating: 2

Trend: Improving

3. Board Recommendations

V. SUPPORTING DATA AND SUMMARIES

A. Construction Deficiency Reports

Thirteen construction deficiency reports (CDRs) were reported during this period. Table 4 presents the deficiencies according to type (i.e personnel error, design error, component failure, etc.) and as a function of SALP functional areas. As indicated in the table seven of the thirteen CDRs were related to electrical and instrumentation and controls construction activities. Performance in this functional area is discussed in Section IV.B.

B. Investigations

The NRC Office of Investigation completed two investigation during this SALP assessment period. One was related to an allegation that certain pipe spools supplied by Dravo were not properly inspected. The second involved an allegation that certain calibration records were falsified. Neither investigation resulted in any adverse findings with regard to Hope Creek.

C. Escalated Enforcement

There has never been any escalated enforcement actions associated with Hope Creek.

D. Management Conferences

The following management conferences were held during the assessment period:

DATE	SUBJECT
October 22, 1984	NRC Inspection Program for the Transition from Construction to Operation
February 11, 1985	The System Turnover Process
February 15, 1985	SALP for the Period August 1, 1983 - October 31, 1984
August 1, 1985	Simulator Response During the First Operator Cold Licensing Exams

TABLE 1

INSPECTION HOURS SUMMARY

(11/1/84 - 10/31/85)

Summary by Fuctional Area

	FUNCTIONAL AREA	HOURS	% OF TIME
A.	Construction activities	1522	24.4
B.	Electrical/I&C Construction	542	8.7
C.	Quality Assurance	569	9.1
D.	Preoperational Testing	1822	29.3
E.	Plant Operations/Operational Readiness	809	13.0
F.	Maintenance	143	2.3
G.	Radiological Controls	295	4.7
H.	Security	59	1.0
I.	Emergency Preparedness	467	7.5
J.	Licensing	*	*
	TOTAL	6228	100.0

*Hours expended in facility license activities and operator license activities not included in direct inspection effort statistics.

TABLE 2

INSPECTION REPORT ACTIVITIES

(11/1/84 - 10/31/85)

REPORT NO	HOURS	TYPE	INSPECTED AREAS
84-19	66	S	Preoperational Quality Assurance program.
84-20	54	S	Preoperational testing.
84-21	170	S	Electrical power supply and distribution.
84-22	-	R	Preoperational management meeting.
84-23	-	-	(Covered in 1984 SALP)
84-24	110	R	Work in progress, preoperational testing, open items, prevention maintenance. and system turnovers.
84-25	32+37	S	Preservice inspection of piping systems/supports.
84-26	-	R	SALP
84-27	61	S	QA/QC turnover procedures.
84-28	56	S	Preoperational testing.
84-29	171	R	Work in progress, preoperational testing, open items, transition from construction to operations.
85-01	117	S	Mechanical components, piping systems/supports, QA and PSI.
85-02	44	S	Radiation protection, chemistry, and rad waste.
85-03	36	S	Instrument components and control systems.
85-04	-	S	(Cancelled)
85-05	74	R	Construction, testing, and procedure review.
85-06	75	S	Review of pre-op tests, system flushes, as-built comparison, supports, and QA/QC.

REPORT NO	HOURS	TYPE	INSPECTED AREAS
85-07	NA	R	Management meeting on system turnover and control room design.
85-08	473+168	S	Independent measurements of safety related piping.
85-09	-	S	(Cancelled)
85-10	34	S	Electrical power supply and distribution.
85-11	114	S	QA/QC for pre-ops and startup testing.
85-12	94	S	Hydrostatic testing of the reactor vessel and associated piping.
85-13	53	S	Preoperational test procedure review/verification.
85-14	191	R	Work in progress, preoperational testing, open items.
85-15	104+9	S	Piping systems and supports, PSI.
85-16	39	S	Preoperational radiation protection program.
85-17	112	S	Safety related electrical systems.
85-18	53	S	Preoperational test procedure review/verification.
85-19	71	S	Class 1 small pipe and pipe supports.
85-20	71+8	S	Piping systems and supports.
85-21	72	S	QA propram, instrumentation and control.
85-22	41	S	Safety related components.
85-23	72	S	Electrical supply and distribution.
85-24	180+60	S	Support systems.
85-25	41	S	Security program.
85-26	39	S	Preoperational testing.
85-27	307	R	Work in progress, preoperational testing, open items.
85-28	38	S	Preservice inspection.

REPORT NO	HOURS	TYPE	INSPECTED AREAS
85-29	-	L	Operator and senior operator cold license exams.
85-30	70	S	Preoperational testing and QA.
85-31	36+8	S	Soils and foundations.
85-32	-	H	Review of Independent Design Verification Program.
85-33	176	S	OPS QA program.
85-34	34	S	Electrical power supply and distribution.
85-35	249	R	Work in progress, preoperational testing, open items.
85-36	118	S	Preoperational testing.
85-37	33	S	Preservice inspection.
85-38	88	S	Preoperational QA program, OPS.
85-39	59	S	Instrumentation and controls, support systems.
85-40	283	S	Emergency preparedness program appraisal.
85-41	270	S	New fuel storage in high density spent fuel racks.
85-42	176	R	Work in progress, preoperational testing, open items.
85-43	-	L	Operator licening meeting on simulator performance.
85-44	81	S	Radiation protection, chemistry, and rad waste.
85-45	208	R	Work in progress, preoperational testing, open items.
85-46	35	S	Preservice inspection.
85-47	112	S	Preoperational inspection.
85-48	-	L	Operator license exams.
85-49	-	L	Operator license exams.
85-50	-	S	(Cancelled)
85-51	79	S	QA and preventive maintenance.

REPORT NO	HOURS	TYPE	INSPECTED AREAS
85-52	100+31	S	Radiation protection, chemistry, and rad waste.
85-53	160	S	Observation of annual full scale emergency exersize.
85-54	-	H	Review of Independent Design Verification Program.

Note: Key for TYPE of inspection; R - Resident Inspector, S - Specialist Inspector, L - Operator Licening Activity, and H - Headquarters Inspection.

TABLE 3

ENFORCEMENT DATA

(11/1/84 - 10/31/85)

Number and Severity Level of Violations

Severity level I	0
Severity level II	0
Severity level III	0
Severity level IV	10
Severity level V	4
TOTAL	14

Violations Correlated by Functional Area

	FUNTIONAL AREAS	SEVERITY LEVEL I	II	III	IV	V
A.	Construction activities					
B.	Electrical/I&C Construction				5	3
C.	Quality Assurance					
D.	Preoperational Testing				4	
E.	Plant Operations/Operational Readiness					
F.	Maintenance				1	1
G.	Radiological Controls					
H.	Security					
I.	Emergency Preparedness					
J.	Licensing					
	TOTAL				10	4

TABLE 3 (CONT)

Summary of Violations

REPORT	SEVERITY	AREA	NATURE
84-21	V	B	Two examples of improper installation of electrical cables.
84-29	IV	D	Failure to follow procedures for control of measuring and testing equipment.
85-01	IV	F	Preventive maintenance not established to prevent DG component corrosion.
85-03	V	B	Instrumentation tubing not appropriately capped during construction work.
	V	B	Lack of inspection of equipment released for testing.
85-05	IV	D	Flushing systems with pipe hangers pinned.
85-10	IV	B	Cable trays not physically protected.
85-17	V	F	Preventive maintenance activities not performed as scheduled.
85-27	IV	D	Three examples of failure to follow preoperational test procedures.
85-35	IV	D	Three examples of FSAR committed testing not being performed.
85-42	IV	B	Design bases of electrical computer alarm points not correctly translated into specifications and drawings.
85-45	IV	B	Failure to tie cables to cable tray rung.
85-51	IV	B	Inadequate design control for disposition of NCRs on instrumentation.
	IV	B	Reversed wire-to-terminal connections on instrumentation.

TABLE 4

CONSTRUCTION DEFICIENCY REPORTS

(11/1/84 - 10/31/85)

Type of Deficiency

	TYPE	NUMBER
A.	Personnel Error	1
B.	Design Error	3
C.	External Cause	1
D.	Defective Procedures	2
E.	Component Failure	3
F.	Fabrication Error	3

Correlated By Functional Area

	FUNCTIONAL AREA	CAUSE CODE	TOTAL
A.	Construction activities	1B,1E,1F	3
B.	Electrical/I&C Construction	3B,1C,2E,1F	7
C.	Quality Assurance	1D	1
D.	Preoperational Testing	1F	1
E.	Plant Operations/Operational Readiness	0	0
F.	Maintenance	1A	1
G.	Radiological Controls	0	0
H.	Security	0	0
I.	Emergency Preparedness	0	0
J.	Licensing	0	0
			13