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ENCLOSURE

SALP REPORT

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

INSPECTION
REPORT NUMBERS

50-348/88-04, 50-364/88-04

Alabama Power Company

Joseph M. Farley Units 1 and 2

August 1, 1986 through March 31, 1988

I. INTRODUCTION

The Systematic Assessment of Licensee Performance (SALP) program 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. The SALP is supplemental to normal regulatory processes used to ensure compliance with NRC rules and regulations. The SALP is intended to be sufficiently diagnostic to provide a rational basis for allocating NRC resources and to provide meaningful guidance to the licensee's management to promote the quality and safety of plant construction and operation.

An NRC SALP Board, composed of the staff members listed below, met on May 16, 1988, 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 for the J. M. Farley facility for the period August 1, 1986 through March 31, 1988.

SALP Board for the J. M. Farley facility:

A. F. Gibson, Director, Division of Reactor Safety, RII (Chairman)
C. W. Hehl, Deputy Director, Division of Reactor Projects (DRP), RII
D. M. Collins, Acting Director, Division of Radiation Safety and Safeguards, RII
D. M. Verrelli, Chief, Projects Branch 2, DRP, RII
E. G. Adensam, Director, Project Directorate II-1, NRR
W. H. Bradford, Senior Resident Inspector, Farley, DRP, RII
E. A. Reeves, Senior Project Manager, Project Directorate II-1, NRR

Attendees at SALP Board Meeting:

K. D. Landis, Chief, Technical Support Staff (TSS), DRP, RII
H. C. Dance, Chief, Project Section 2B, DRP, RII
L. P. Modenos, Project Engineer, Project Section 2B, DRP, RII
W. Miller, Resident Inspector, Farley, DRP, RII

II. CRITERIA

Licensee performance is assessed in certain functional areas depending upon whether the facility has been in the construction, preoperational, or operating phase. Each functional area normally represents an area which is significant to nuclear safety and the environment and which is a normal programmatic area. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

One or more of the following evaluation criteria were used to assess each functional area; however, the SALP Board is not limited to these criteria and others may have been used where appropriate.

A. Management involvement in assuring quality

B. Approach to the resolution of technical issues from a safety standpoint

C. Responsiveness to NRC initiatives

D. Enforcement history

E. Operational and construction events (including response to, analysis of, and corrective actions for)

F. Staffing (including management)

G. Training and qualification effectiveness

Based upon the SALP Board assessment, each functional area evaluated is classified into one of the 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 or construction 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 are reasonably effective so that satisfactory performance with respect to operational safety or construction is being achieved.

Category 3: Both NRC and licensee attention should be increased. Licensee management attention and 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 or construction is being achieved.

The functional area being evaluated may have some attributes that would place the evaluation in Category 1, and others that would place it in either Category 2 or 3. The final rating for each functional area is a composite of the attributes tempered with the judgement of NRC management as to the significance of individual items.

The SALP Board may also include an appraisal of the performance trend of a functional area. This performance trend will only be used when both a definite trend of performance within the evaluation period is discernable and the Board believes that continuation of the trend may result in a change of performance level. The trend, if used, is defined as:

Improving: Licensee performance was determined to be improving near the close of the assessment period.

Declining: Licensee performance was determined to be declining near the close of the assessment period.

III. SUMMARY OF RESULTS

A. Overall Facility Performance

The Farley facility is well managed by qualified and experienced personnel. Senior plant managers hold active senior reactor operator licenses and the site is supported by a corporate organization that is composed of personnel who have extensive backgrounds in nuclear plant management and operations. The licensee remains responsive to NRC concerns and the organization is safety oriented. Strengths were identified in the areas of plant operations, radiological controls, fire protection, outages, and licensing activities.

The Farley Nuclear Plant was effectively managed and continues to achieve a satisfactory level of operational safety. The licensee has strong programs in all aspects of plant operation. The licensee has set high standards for cleanliness, radioactive waste control, and general plant operations. The licensee is dedicated to long run time and short refueling outages.

Farley has established an excellent long-term operating record. The work force is stable which is conducive to good relations between management and personnel and a high experience level in the operating staff. Plant operations personnel respond to plant trips in a professional and competent manner. There is strong plant support from a very capable corporate staff. However, there were certain areas of concern which were noted and require management attention. These areas include quality programs and engineering support. Throughout the SALP period, a common problem of failure to follow procedures was noted. Continued management attention is required to assure improved performance in procedural compliance.

The licensee has initiated corrective action from a Self Assessment Program that identified problem areas and established specific goals for improvement.

During the SALP period, the Farley plant had high availability, fewer than average number of reactor trips, few inadvertent ESF actuations, prompt and thorough reporting of events when required, and low occupational radiation exposures.

B. The performance categories for the current and previous SALP period in each functional area are as follows:

Functional Area	January 1, 1985 - July 31, 1986	August 1, 1986 - March 31, 1988
Plant Operations	1	1
Radiological Controls	1	1
Maintenance	1	2
Surveillance	1	2
Fire Protection	1	1
Emergency Preparedness	2	2
Security	2	2
Outages (includes refueling)	1	1
Quality Programs and Administrative Controls Affecting Quality	2	2
Licensing Activities	1	1
Training	2	2
Engineering	N/A	2

IV. Performance Analysis

A. Plant Operations

1. Analysis

During the assessment period, inspections were performed by the resident, regional and headquarters inspection staffs. A special announced Operational Performance Assessment (OPA) was conducted to evaluate the licensee's current level of performance in the area of plant operations.

The plant was well managed with conscientious and capable personnel. The qualifications of plant management exceeded NRC requirements. All senior plant managers hold current senior reactor operator licenses.

The licensee's supervisory staff was knowledgeable and proficient in day-to-day plant operations. Major operational decisions were made at a management level adequate to assure appropriate supervisory involvement. Plant operations were conducted in a conservative manner to ensure plant safety. Good

management control and interface was noted at status meetings. Operations management conducted routine plant and control room tours and had initiated employee interface meetings to improve communications and expedite problem resolution. Operators had a positive attitude towards operations and plant management. Overall control of plant operations was well planned with established and realistic priorities.

The licensee was responsive to problems identified by NRC. The licensee generally demonstrated knowledge of regulations, guides, standards and generic issues; and interpretations of these documents and associated issues were usually conservative. An exception to this was the classification, without supporing analysis, of safety related room coolers as attendant equipment instead of required equipment for operability determinations.

Licensee technical competence was well founded both in technical matters and general plant operations. The plant staff responded to plant trips and other operational events during this review period in a professional and competent manner. Daily conduct of business in the control room was performed in a professional manner. The plant staff is normally observant of Limiting Conditions for Operation (LCOs) and was generally conservative in its application of action statement requirements. Professionalism is very evident throughout the site organization. Control room operations appear to be well organized. The operating shifts are uniformed. The staff organization, communications between the various operations personnel and shift turnover was good; however, during the Operational Performance Assessment (OPA), some poor communications during shift turnovers were observed. The fire protection administrative workload was heavy and distracted from other Shift Supervisor duties. Shift crews were composed of degreed and non-degreed individuals resulting in a balance of engineering expertise and plant experience. The Operations staff has had a low turnover rate which has resulted in a high experience level in the operating staff.

Control room drawings were easily accessible, accurate, very legible, and in very good physical condition with a mylar protective coating. Shift logs were well maintained. The failure to maintain procedure and drawing controls in other areas of the plant had been identified by the licensee's Safety Audit and Engineering Review (SAER) internal audit on two occasions. Although the problem was reportedly corrected, a subsequent SAER audit identified that the corrective action was inadequate. Additional examples of incorrect procedure and drawing revisions were identified by a subsequent NRC inspection and a violation for inadequate corrective action was issued.

Access to the control room was controlled and limited to personnel conducting business. Radios and reading material not directly related to plant operation are not allowed in the control room or plant. The control boards had few outstanding maintenance work requests/deficiency tags. The licensee appears to place proper emphasis on maintenance of control board instrumentation. The control room operators were cognizant of lit annunicators on the main control board and the number of lit annunciators were kept to a minimum. Color coding of instrumentation in the control room and plant doors reflected human factors consideration. The majority of piping was also labeled. The licensee is in the process of upgrading an equipment labeling program.

There was good member participation during Plant Operations Review Committee (PORC) meetings and evidence of strong management control. These aspects were considered to be a strength of the PORC review process. The PORC appeared to be accomplishing their mission and performing adequate reviews and safety evaluations.

NRC evaluations of programs for control of equipment indicated that certain weaknesses existed. Guidance on post-maintenance testing was limited and heavy reliance was placed on the Shift Supervisor and operator experience to determine the scope of testing needed. Several problems in the tagging of equipment were noted. Examples of problems identified and supported by incident reports are: hold tags lacked sufficient information to allow prompt reference to a specific clearance or to equipment tagged; inadequate MWR details making tagging more difficult; use of standard tagouts is limited; and some Shift Foremen Inspecting were not adequately trained or experienced in reading electrical schematic drawings. Licensee trending and evaluation of these incidents and other plant events had been initiated only toward the end of the assessment period. Some safety-related charging pump valves were found locked at the valve rather than at the remote operator. These valves could be inaccessible under accident conditions.

Four reactor trips occurred on Unit 1 during the assessment period. Two trips were caused by equipment malfunction and two trips were cause by operator error. Unit 2 had three reactor trips during this period. Two trips were caused by equipment malfunction and one trip was caused by operator error. Above 15% power, the Farley reactor trip rate of 0.26 per 1000 critical hours compare favorably to a national average of 0.43. Reactor Trip summaries are provided in Section V.I.

Four violations were identified. All the violations involve procedural adherence problems.

a. Severity Level IV violation for failure to adhere to procedure requirements of verifying the lube oil strainer elements part number. Consequently, the wrong strainers were installed. (348,364/87-02)

b. Severity Level IV violation for failure to adhere to procedure requirements invol ing control room operator manning. (348/87-10)

c. Severity Level IV violation for failure to adhere to procedure operating requirements involving 1B RHR pump room cooler functional testing. (348,364/87-13)

d. Severity Level IV violation for five examples of procedural violations caused by personnel error. Four electrical breakers were found to be out of the position required by the appropriate Systems Operating Procedure, and the service water lube oil and cooling water piping systems were not included in the appropriate flow path verification procedure. (348,364/88-03)

2. Conclusion

Category: 1

3. Recommendations

A high level of performance was achieved in this area. The NRC staff resources applied to the routine inspection program should be reduced.

B. Radiological Controls

1. Analysis

During the assessment period, inspections were performed by the resident and regional inspection staffs. The inspections included four routine radiation protection inspections, four routine radiological effluents and chemistry inspections which included confirmatory measurements using the Region II mobile laboratory, and two reactive inspections as a result of the transfer of licensed radioactive material to an unauthorized recipient and an unauthorized entry by a licensee employee into a high radiation area greater than 1000 mrem/hour.

The licensee's health physics and chemistry staffing levels were appropriate and compared well to other utilities having a facility of similar size. An adequate number of ANSI qualified licensee and contract health physics technicians and qualified

chemistry technicians were available to support routine and outage operations. Key positions in the radwaste management program and environmental surveillance programs were also filled with qualified staff.

The knowledge and experience level of the site health physics and chemistry staffs were good. The staff had a low turnover rate and an effective training program which has received INPO accreditation. The performance of the staff in support of routine operations and outages was good.

Management support and involvement in matters related to radiation protection, radwaste control and chemistry were very good as evidenced by procurement of new laboratory counting equipment and addition of a new radwaste solidification facility. Health physics management was involved sufficiently early in outage preparations to permit adequate planning. The plant's radiation protection manager and plant chemist received the support of other plant managers in implementing the radiation protection and chemistry programs.

Resolution of technical issues by the health physics and chemistry staff was good as evidenced by the development of a Hot Particle Control Program which included the use of contamination containments, ventilation systems and special training of HP technicians in the detection, identification and retention of hot particles on equipment and personnel. Satisfactory resolution of technical issues was further evidenced by the development of radiological controls for retrieval of a safety injection line thermal sleeve which was retrieved from Unit 2 reactor vessel. Radiation controls within containment were observed by the NRC during Unit 2 refueling outage when the loose 6-inch safety injection nozzle was recovered from the reactor vessel. The evolution was well organized and dose results were maintained below the planning values.

Responses to NRC initiatives were conducted in an effective and acceptable manner as evidenced by the development of improved training elements for sampling radioiodine during accident conditions and the revision of procedures to describe training.

The licensee received a Severity Level III violation for failure to adequately control access to a high radiation area greater than 1000 mrem/hour with a locked door to prevent unauthorized entry. An individual inadvertently entered the high radiation area thereby causing a potential for a significant overexposure. The licensee elected to control access to a high radiation area in the auxiliary building with dose rates up to 240 R/hr with a

three rope barricade and a flashing red light. The area was posted as an exclusion area rather than constructing an enclosure which could be locked as required by plant Technical Specifications. No Civil Penalty was assessed due to the licensee's prior good performance in the area and due to prompt corrective actions which included retraining of appropriate personnel on exclusion area controls, expanding all exclusion area boundaries to control access by a locked door, adopting a new system for issuance of exclusion area keys, and modifying the Radiation Worker Training Course to include the controls and precautions for exclusion areas.

The licensee's radiation work permit and respiratory protection programs were found to be satisfactory. In December 1986, the amount of contaminated area was 21,130 square feet which represents 18.1% of the radiologically controlled area of the plant. In 1987, the licensee reduced the total contaminated area to 12,986 square feet, which represented a 39% decrease from 1986. In 1987 there was a 5.7% decrease in the number of clothing and skin contamination incidents compared to 1986.

The 1987 cumulative radiation exposure was 299 person-rem per unit. This compares better than the national average exposure of 368 person-rem per PWR unit. This lower than average collective dose resulted from the aggressive exposure control program established and implemented by the licensee. The licensees' action to raise the pH of the Reactor Coolant System (RCS) to reduce plateout of Co-60 demonstrates initiative toward reducing exposure. This reduced plate out resulted in a 50% reduction in the radiation levels in the Steam Generators (S/Gs) during shutdown maintenance activities. The use of a computerized exclusion area access authorization system for S/G work (stay times calculations and positive control over entries) also resulted in the lowering of radiation doses.

During 1987, the licensee disposed of 9,411 cubic feet of solid radioactive waste per unit containing 334 curies. This is approximately 50% of the total waste shipped by the licensee in 1986. This low amount is due primarily to a dedicated solid waste reduction program and the addition of a new radwaste solidification system which should further reduce the amount of radioactive waste generated. During the assessment period, the licensee received a Severity Level IV violation for shipping contaminated mechanical snubbers to a recipient unauthorized to receive any radioactive material. The licensee took prompt and effective correction action to ensure that all material which had been inside the RCA was surveyed by licensee health physics personnel prior to offsite shipment by warehouse personnel.

A confirmatory measurements inspection indicated that the licensee's counting results met the established NRC criterion for comparing counting results except that a negative bias was observed for a 14cc vial gas sample from the waste gas decay tank. This bias was attributed to sample preparation techniques because the bias was consistent for the four detectors for all isotopes. During an inspection in March 1988, the licensee received a violation for failure to make attenuation corrections for self absorption of gamma photons in a solid polymer standard which was used for calibrating the detectors for counting gaseous samples. Count room equipment was, in general, not state-of-the-art since it was procured in the early 1970s. However, the licensee has ordered new equipment and expects onsite delivery by the latter half of 1988.

A simulated liquid waste sample which contained H-3, Sr-89, Sr-90 and Fe-55 was provided to Alabama Power Company in May 1987 by the NRC. The licensee's results compared favorably with the NRC established criterion for comparing analytical results.

Liquid and gaseous radioactive effluents were within the Technical Specification limits and in compliance with 40 CFR 190 limits for radiation dose and radioactivity concentration in effluents. Fission and activation products in the gaseous effluents for 1987 were 35% lower than in 1986. Also, 1987 values for gaseous iodines and particulates were 75% lower than 1986 values. In general, gaseous effluents for Farley Unit 1 have been steadily declining since 1982 when Farley experienced problems with failed fuel. Radioactivity in the liquid effluents was 47% lower in 1987 as compared to 1986. Tritium in liquid effluents has remained essentially constant for the past three years. Gross alpha radioactivity in the liquid effluent was essentially background, 2E-5 curies (Ci) per year. Annual effluent release summaries for 1985-1987 can be found in Section V.K.

The licensee reported a total of five non-routine releases (three liquid releases and two gaseous releases) during 1987. The gaseous releases occurred on Unit 2 and totalled 8.7 E-6 Ci. These monitored, planned releases were caused by steam generator pressure pulse cleaning and steam generator helium leak testing. The non-routine liquid releases occurred on Unit 1, and a total of 8.65 E-5 Ci were released. Two of the releases were due to a Refueling Water Storage Tank barrier penetration leak, and a third release was caused by a leak in the pumping equipment on the Reactor Makeup Water Storage Tank.

Radiation doses to the maximally exposed offsite individual from liquid and gaseous effluents for 1987 were calculated to be 0.16 mRem to the whole body and 0.17 mRem to the critical organ. These values were consistent with previous annual dose estimates and below 40 CFR 190 limits.

The licensee continued to meet the criteria for good chemistry control established by the Steam Generator Owners Group and Westinghouse. However, general corrosion of carbon steel pipe throughout the secondary coolant system continued to result in hundreds of pounds of "sludge" being transported to the steam generators. Since this sludge had already initiated tube denting, the licensee continued to add boric acid as well as AVT control chemicals (ammonia and hydrazine) to the feedwater. This action, in turn, complicated the pH control needed to prevent general corrosion and pipe thinning. Consequently, the licensee planned to take two major steps to provide additional protection to the steam generators. During refueling outages (October 1987 and April 1988) the steam generators were cleaned by a pressure-pulse technique in an effort to remove solid iron-copper oxides from tube-tube sheet crevices and from the secondary sides of the steam generator tubes. Secondly, beginning in the next fuel cycles, morpholine will be substituted for ammonia for pH control in an effort to maintain higher pH conditions in the carbon steel piping.

Six violations were identified as follows:

a. Severity Level III violation with three examples: (1) failure to adequately control access to a high radiation area, (2) failure to follow procedures, and (3) failure to adequately instruct individuals working in or frequenting a restricted area (348, 364/88-02).

b. Severity Level IV violation for failure to assure that a recipient was authorized to receive radioactive material (348, 364/86-26).

c. Severity Level IV violation for failure to comply with DOT regulations applicable to the transportation of radioactive material (348, 364/86-26).

d. Severity Level IV violation for failure to follow the requirements of a radiation work permit (348, 364/87-28).

e. Severity Level IV violation for failure to maintain records of survey when local instrumentation was out of service (364/87-29).

f. Severity Level V violation for failure to make attenuation corrections for self absorption of gamma photons in a solid polymer standard used for calibrating the detectors for counting gaseous samples (348,364/88-10).

2. Conclusion

Category: 1

3. Recommendations

A high level of performance was achieved in this area. The NRC staff resources applied to the routine inspection program should be reduced.

C. Maintenance

1. Analysis

During the assessment period, inspections were conducted by the resident and regional inspection staffs.

Management involvement in maintenance planning and practices were evident. The daily planning meetings were observed to be used effectively in communicating station maintenance activities and in prioritizing work. The inclusion of Senior Reactor Operator (SRO) qualified individuals on the planning staff was observed to be an asset in maintenance planning.

The licensee recently established an aggressive program that has reduced the number of active Maintenance Work Requests (MWRs). The effort to reduce the number of backlogged MWRs, and the practice of keeping plant personnel aware in this area is a strength in maintenance area.

Licensee management initiated and completed a Self-Assessment Program which delineated eight specific problem areas. They established goals to upgrade and improve the maintenance practices. This includes items such as: developing a maintenance procedure writers guide; developing additional needed maintenance procedures; revising existing maintenance procedures to incorporate vendor manual guidelines; integrating corrective maintenance with required planned maintenance; developing performance teams to improve communications, and, developing methods to assure complete work request packages. The self-assessment findings by the licensee reflected many of the same concerns identified by the NRC. The licensee's report appeared to be an objective characterization of problems the licensee is

either facing or can expect to face as the plant ages. The straight-forward approach to these problems and realistic solutions proposed, are evidence of recognition of problems in maintenance and sound forethought in the area of plant management. The Self-Assessment Program was considered a strength to the maintenance support of operations.

Use of the Nuclear Plant Reliability Data System has increased the licensee's awareness of potential plant problems. Upgrades in the Farley Nuclear Plant Information Maintenance System and implementation of data verification has improved the data base used for maintenance planning and scheduling. Staffing increases added maintenance planners who provided better scheduling and coordination of the activities of each maintenance discipline.

The licensee utilizes a predictive maintenance analysis which includes oil and vibration analysis on mechanical equipment and infrared analysis on electrical equipment. These techniques have enabled the licensee to predict degrading trends in equipment performance and effect repairs before equipment failure occurs.

Plant equipment condition and housekeeping was well maintained; however, in one case scaffolding was attached to safety-related equipment without being analyzed for seismic considerations.

Concerns with the lack of written maintenance procedure for work on safety-related components, lack of valve torquing specifications, inadequate root cause evaluations on ASCO solenoid valves and the lack of independent verification requirements for jumpers placed by MWRs were identified as weaknesses in the licensee's control of work activities. It is noted that, in some MWRs, jumpers had been used for various troubleshooting activities. Technicians were required to document use of temporary alterations such as lifted leads, jumpers, and sliding links on a continuation sheet of the MWR. However, independent verification for jumpers was not a requirement in the administrative control procedure. Documentation of root causes for component failures were not always clear or in some cases were missing completely. For example, MWR failure descriptions, such as "blown fuse", had no documented determinations of root causes, and adequate root cause evaluations were not performed for some ASCO solenoid valve failures. The licensee's program also failed to flag overdue lubrications. Also, an acceptable grace period for overdue lubrications had not been specified.

As of November 1987, there were in excess of 400 backlogged Preventative Maintenance (PM) work authorizations. It was noted that there were problems completing the PM tasks because of the volume of corrective maintenance being performed and due to the difficulty in coordinating PMs between the disciplines on the same systems. PM coordination problems were recognized in the licensee's maintenance self-evaluation, and plans exist to implement a computer-based repetitive task program to administer the PM program.

The licensee had been attempting to terminate fouling and corrosion of service water pipes by macro- and micro-organisms through the development of improved biocide treatment to replace the chlorination program currently used. However, prior to 1986, the licensee's efforts to control the infiltration of clams into the service water system had not been given adequate management attention. Deviation (g) was cited in 1986 for failure to meet commitments for chlorinating the service water system. Similar biofouling problems were identified in 1983. Investigations were not implemented in a prompt corrective manner which resulted in a degraded service water system.

For more details on maintenance related activities see sections IV.I and IV.L of this report.

Six violations were identified and one deviation. All the violations involved failure to follow approved procedures. Violation b involved a Technical Specification violation which was brought on by a related procedural violation in the maintenance area. The corrective actions initiated by the licensee relating to strict procedure adherence has been only somewhat effective.

a. Severity Level IV violation for failure to follow procedures concerning placing and removing electrical jumpers defined by specific documentation and for failure of first line supervision to control the quality of work being performed. (348/86-29)

b. Severity Level IV violation with two examples: changed operating mode from 5 to 4 and 4 to 3 while dependent only upon Technical Specification Action Statement. The licensee failed to place one ECCS subsystem to operable status within an hour or place the unit in cold shutdown within the next 20 hours. (348/86-29)

c. Severity Level IV violation for failure to fully implement an approved procedure regarding the diesel generators air start compressors pressure switches. (348,364/87-23)

d. Severity Level IV violation for two examples of procedural violations and inadequate post maintenance testing which allowed a wiring error to exist and cause 2C diesel generator not to have non-essential engine protection. (348,364/87-17)

e. Severity Level V violation for failure to maintain environmental conditions during calibration activities and not performing evaluations promptly for equipment found out-of-calibration (348,364/87-03).

f. Severity Level V violation for failure to follow prescribed procedures for control of entry of contaminates into class A, B or C systems when work activities require systems to be opened. (364/87-29)

g. Deviation for failure to meet commitment for chlorinating the service water system. (348,364/86-18)

2. Conclusion

Category: 2

3. Recommendations

The NRC staff resources applied to the routine inspection program should be maintained.

D. Surveillance

1. Analysis

During the assessment period, inspections were performed by the resident and regional inspection staffs. These included activities related to inservice inspection and testing, surveillance, and containment integrated leak rate testing.

Routine plant surveillance-related activities were planned and well defined. The lack of administrative controls over the use of "not applicable (N/A)", in surveillance and operating procedures, was noted as a weakness in management control of surveillance testing. Inappropriate use of "N/A" inserted for a surveillance prerequisite step was a contributing factor in the RHR "A" train event, where 2200 gallons of water was discharged through the Pressurizer Relief Tank rupture disc to the containment sump. Reviews of surveillance activities were performed by prescribed licensee reviewers who were qualified to perform these activities. Review of surveillance records

revealed that they were readily available, complete, and adequately maintained. Onsite evaluations were routinely performed to address, assess and correct surveillance concerns. The licensee's onsite corporate QA organization's audits were noted as being critical and honest concerning the surveillance program.

Licensee management involvement in Inservice Testing activities was adequate. Decision-making was at a level that assured proper review. Corporate management was involved in over-sight activities, and reviews were timely, thorough and technically sound. Records were complete, well maintained, and readily available.

The surveillance procedures were reviewed, tests observed, and test results examined. The licensee's surveillance procedures were technically adequate, executed satisfactorily and test results were acceptable.

Integrated leak rate testing for Unit 2 was witnessed by the NRC staff during this performance period. The test procedure showed evidence of prior planning, assignment of responsibility and control of test activities. The licensee utilized highly qualified contractor test personnel to assist in testing and data evaluation. Problems identified were quickly elevated to higher management. The test procedure was followed and any changes were properly documented. Test personnel and management demonstrated a general understanding of leak rate issues. Resolutions of issues were reasonably conservative, sound and timely. Staffing and training were adequate.

An inspection was performed in the areas of emergency diesel generator (EDG) surveillance testing, emergency start logs, and annual reliability reporting. In the area of EDG surveillance testing, no violations were identified. Review of the test procedure indicated that the licensee's policies were strictly adhered to during the performance of the tests. Timely resolutions to deficiencies encountered as a result of the test were generally demonstrated.

In the area of maintaining EDG start logs, violation (b) was issued for both units. The violation identified inadequately maintained EDG start logs along with a technically incorrect administrative procedure that governed the EDG start logs. Adherence to the incorrect administrative procedure could result in an improper evaluation of test data.

In the area of EDG annual reliability reporting, no violations were identified; however, due to an incorrect licensee interpretation of the Technical Specification reporting requirements, the annual report did not contain all the required information. As a result, the licensee committed to provide the additional information in a revision to the 1986 annual EDG reliability report and to report the additional information in the future. Although information was lacking, the 1986 annual report was issued in a timely manner.

Four violations were identified. The violations can all be classified as personnel error and are not programmatic.

a. Severity Level IV violation for failure to demonstrate auxiliary feedwater flowpaths operable prior to entering Mode 2 during startup of Unit 2. (348,364/86-15)

b. Severity Level IV violation for failure to complete test data logs for the emergency diesel generators as specified. (348,364/87-31)

c. Severity Level IV violation for failure to adhere to procedure requirements in that a surveillance test procedure was not completed properly. (348,364/87-35)

d. Severity Level IV violation for failure to make Integrated Leak Rate Test corrections for containment penetrations where repairs had been made. (348/86-25) This violation has been denied by APC and is under review by the NRC.

2. Conclusion

Category: 2

3. Recommendations

The Board recommends that NRC staff resources applied to the routine inspection program be maintained.

E. Fire Protection

1. Analysis

During the assessment period, inspections were performed by the resident and regional inspection staffs. Areas inspected included followup on previously identified fire protection items and assessment of the status of the licensee's implementation of the requirements and commitments of 10 CFR 50, Appendix R.

The licensee's procedures for the administrative control of fire hazards within the plant, surveillance and maintenance of the fire protection systems and equipment, and organization and training of the plant fire brigade were found to meet the minimum NRC requirements and guidelines.

The staff's inspection also reviewed the licensee's implementation of the fire prevention administrative controls. General housekeeping and control of combustible and flammable materials in safety-related areas were found to be very good. The fire protection extinguishing systems, fire detection systems and fire rated assemblies protecting plant systems required for safe shutdown were found to be functional, or appropriate compensatory measures were employed. In addition, the surveillance inspections, tests and maintenance of the plant fire protection systems were found to be satisfactory and current as required by the plant technical specifications.

The organization and staffing of the plant fire brigade meet the requirements of plant technical specifications and NRC guidelines. Fire protection staff positions were identified and authorities and responsibilities were clearly defined. Personnel were well qualified for their assigned duties. The training and drill records for the individual fire brigade members reviewed were found to be current and satisfied the requirements of plant procedures and NRC guidelines. However, it was identified that the number of shift fire brigade drills conducted during three quarters of 1986 did not satisfy plant procedural requirements of six drills per quarter. (See violation b)

The annual and triennial fire prevention/protection QA audits were conducted within the specified frequency and appeared to cover all of the essential elements of the fire protection program. The licensee had implemented corrective actions or was reviewing the items to determine the appropriate corrective actions.

With the exception of the violations identified, the management involvement and control in assuring quality in the fire protection program is evident due to the involvement in the site fire protection program, and the implementation of fire protection procedures which meet NRC guidelines. The licensee's approach to the resolution of technical fire protection issues indicates an apparent understanding of issues.

Three violations were identified but do not indicate any programmatic problems.

a. Severity Level IV violation for failure to initiate proper fire watches. (348,364/88-03)

b. Severity Level V violation for failure to conduct the required number of quarterly shift fire brigade drills per plant procedures. (348,364/87-07)

c. Severity Level V violation for assigned person not being alert on a continuous fire watch duty. (348,364/87-24)

2. Conclusions

Category: 1

3. Recommendations

A high level of performance was achieved in this area. The NRC staff resources applied to the routine inspection program should be reduced.

F. Emergency Preparedness

1. Analysis

During the assessment period, inspections were performed by resident and regional inspection staffs. These included observation of the annual emergency preparedness exercises in December 1986 and September 1987. A routine emergency preparedness inspection was performed in February 1988. Two Radiological Emergency Plan (REP) revisions and three temporary change notices were reviewed during the assessment period.

Observation and critique of the exercises indicated that the REP and Implementing Procedures could be adequately implemented by the licensee, although several weaknesses and areas for improvement were identified by the licensee and NRC. These items were formally documented. The licensee committed to corrective actions consistent with regulatory criteria and guidance. One weakness identified involved failure of the offsite monitoring teams to implement field monitoring requirements as listed below. This weakness was indicative of inadequate training of the offsite monitoring teams.

The teams did not:

a. Define and report to the TSC and/or EOF the specific locations at which radiological monitoring data were obtained.

b. Demonstrate the capability of team members to correctly read and use offsite monitoring and survey maps.

c. Demonstrate the ability to implement appropriate health physics practices and contamination controls (e.g., to the contrary, team members dressed-out in protective clothing within the path of the plume; additionally, filters were removed from air particulate samplers with bare hands. No protective equipment was used).

d. Demonstrate the ability to calculate iodine and particulate activity following retrieval of sample air filters and report same to TSC and/or EOF.

e. Periodically check pocket dosimeter readings during offsite monitoring assignments.

An additional weakness was identified in which the licensee failed to include in the initial protective action recommendation, the 22.5° sectors immediately adjacent to the principal zone exposed to the plume.

Areas requiring improvement were the completion of initial notification of emergency declarations and subsequent followups of same, and use of appropriate notification forms for Site Area Emergency and General Emergency declarations. Elements of emergency response determined to be acceptable were: emergency detection and classification; protective action decisionmaking, except as discussed above; shift staffing and augmentation; public information; annual quality assurance audits of plant and corporate emergency preparedness programs; changes to the emergency plan and implementing procedures; coordination of offsite agencies; and identification of deficiencies and required improvements during drills and exercises.

The routine emergency preparedness inspection resulted in a violation for the licensee's failure to provide annual communications training to an Operation Shift Aide designated to perform such functions.

During this assessment period, Region II forwarded to the licensee the FEMA finding that the alert and notification system installed around the Farley Nuclear Station did not satisfy the requirements of NUREG-0654/FEMA-REP-1 and FEMA-43. At the close of the assessment period, the licensee was granted an extension for completion of required actions involving the subject system and the date the system will be re-evaluated. The licensee had requested from FEMA, additional information on the findings, in orde to better define needed corrective actions.

One violation was identified.

a. Severity Level IV violation for failure to provide Control Room Operator Shift Aide required annual communications retraining. (348,364/88-06)

2. Conclusion

Category: 2

3. Recommendations

The Board recommends that NRC staff resources applied to the routine inspection program should be maintained.

G. Security and Safeguards

1. Analysis

During the a sessment period, inspections were conducted by the resident and regional inspection staffs. The Regulatory Effectiveness Review (RER) report for the RER which had been conducted during the previous rating period was issued. The report identified a potential safeguards vulnerability. The licensee has taken interim corrective measures to protect against the potential safeguards vulnerability discovered by the RER inspection. Additionally, the licensee has completed engineering studies and selected replacement equipment to upgrade security hardware and physical security aids which were found deficient during the inspection. The licensee management had increased their awareness of and involvement in the security program, and have worked closely with the Office of Nuclear Reactor Regulation to establish a technically sound physical security upgrade program. An extensive construction project for installations of the upgraded physical security system was initiated in April 1988.

Authority and responsibilities associated with the security organization were clearly delineated and appeared to be effective. The site organization is adequately staffed and appropriately trained and equipped. The facility guard Training and Qualification Plan is implemented on a continuing basis at all levels of the security organization using the onsite training staff supplemented by corporate specialties.

Changes to the licensee's Physical Security Plan were submitted on a timely basis under the provisions of 10 CFR 50.54(p).

The licensee's independent security program audit covered various aspects of the site security program, and the program auditors seem well acquainted with the program. The licensee had taken appropriate actions to respond to NRC initiatives, bulletins, and notices.

One violation was identified. The violation was caused by a failure to follow established procedures.

- Severity Level IV violation for failure to protect safeguards information. (348,364/88-09)

2. Conclusion

Category: 2

3. Recommendations

The Board recommends that NRC staff resources applied to the routine inspection program should be maintained.

H. Outages

1. Analysis

During the assessment period, inspections were performed by the resident, regional, and headquarters inspection staffs. Two refueling outages were performed on Unit 1 in October 1986 and March 1988. One maintenance outage was performed in January 1988 for environmental qualification work on electrical components. Unit 2 had one refueling outage in October 1987 and one maintenance outage in December 1987. This latter forced outage was due to a through wall crack on a six-inch safety injection line. Major activities conducted during the refueling outages consisted of: Unit 2 steam generators pressure pulse cleaning; replacement of new anti-vibration bars in all steam generators on Units 1 and 2; local leak rate testing and containment integrated leak rate testing; replacement of service water 2 inch and under carbon steel piping with stainless steel; extensive environmental qualification upgrade of equipment; installed forced cooling for 7300 process cabinets and shutdown panels; changed cooling water supply on charging/safety injection pumps from service water to component cooling water; installed ATWS Mitigating Scram Actuation Circuity; replacement of Anchor/Darling tilting disc check valves with lift check valves in the emergency auxiliary feedwater system; reactor vessel head conoseal modification; motor operated valve evaluation and testing program (MOVAT); modified MSIV test cylinders; and, repair of upper and lower internals lifting rig tool for Unit 1 damaged during the ten year ISI core barrel lift.

The licensee followed management approved refueling procedures. The procedures were enhanced by monitoring up-to-date fuel status boards inside and outside containment. The licensee's SAER group performed audits during the refueling periods. The

licensee scheduled and followed the refueling outage with the aid of flow and critical path charts. At the conclusion of each refueling outage, the licensee conducted a review of all completed work. Problem areas were identified and analyzed. Special attention was given to these areas for future refueling outage scheduling.

The licensee's overall control and planning for refueling outages results in a well planned and controlled evolution. All work is planned with regard to scope, repair parts and work procedures. Planning for the next refueling outage starts at the conclusion of the present outage. There are in the order of 70 to 100 modifications performed on each unit during a refueling outage with each refueling outage typically scheduled for six weeks. Extensive operator training is conducted prior to the subsequent plant startup to familiarize personnel with plant modifications.

The licensee's interface and control of contractors during refueling outages has become stronger. This is primarily due to business meetings which the licensee has set up with the contractors prior to the start of the work.

Licensee management involvement in inservice inspection (ISI) activities and decision making was at a level that assured adequate management review. Records were complete, well maintained, and available. Strict adherence to procedures and policies was maintained. However, during the OPA, review of ISI problem reports indicated that responses were not being sent back to the System Performance Group nor was that group pursuing the closeout of the problem reports. As a result, nonsafety-related Code C coupling bolts were left installed in the 1A and 1B charging pumps after the replacement bolts were sent to the site. For this problem, the licensee failed to perform an evaluation of equipment operability after discovery of the nonconforming material. This item was dispositioned as an additional example of the vendor report findings on material control.

It should be noted that the licensee routinely performed eddy current testing of all steam generator tubes each outage. This action greatly exceeds the Technical Specification requirements.

The licensee has initiated use of containment maintenance coordinators. Their function is to control and expedite the work in the containment building during refueling outages. The coordinators also ensure the polar crane is used in accordance with the refueling schedule. This appears to have increased coordination and productivity.

No violations or deviations were identified

2. Conclusion

Category: 1

3. Recommendations

A high level of performance was achieved in this area. The NRC staff resources applied to the routine inspection program should be reduced.

I. Quality Programs and Administrative Controls Affecting Quality

1. Analysis

During the assessment period, inspections were performed by the resident and regional inspection staffs.

For the purposes of this assessment, this area is defined as the ability of the licensee to identify and correct their own problems. It encompasses all plant activities, all plant personnel, as well as those corporate functions and personnel that provide services to the plant. The plant and corporate QA staff have responsibility for verifying quality. The rating in this area specifically denotes results of the various groups in achieving quality as well as the QA staff in verifying that quality.

The OPA conducted in February and March 1988 identified that the Safety Audit Engineer Review (SAER) group conducted performance based and effective audits. SAER is staffed by rotating experienced plant personnel into the SAER group for three to five years. This adds plant experience to the SAER and QA experience to various plant positions. The SAER audits both safety-related and nonsafety-related areas. SAER audits identify significant technical findings.

The OPA noted problems with the QC "peer" review system. This was identified by the SAER, but since the deficiencies continue to occur, corrective actions were inadequate.

The OPA found that supervisors (acting in the QC capacity) did not perform independent observations of procedure quality control check points in 1985, 1987, and none through March 9, 1988. QC did observe three maintenance tasks in 1986. This periodicity of performing periodic assessments is considered to be a weakness in assuring that quality control checks are being adequately accomplished.

A self-assessment conducted by the licensee late in the SALP period demonstrated the ability of management to identify performance problems and to plan steps for improvement. Several problems identified by the OPA inspection had been previously identified by this self-assessment and corrective actions were underway. This is a positive indication of management's recent performance in recognizing and providing solutions to problems.

However, the licensee was not effective in identifying and subsequently correcting problems in the area of EQ and procurement control. The licensee was not aware of long-standing problems in this area until they were identified by NRC and followup licensee inspections during this SALP period. The licensee has been slow to acknowledge and correct some of these problems. Escalated enforcement is under consideration. EQ problems are discussed in more details in Section IV.L of this report.

The NRC also conducted a special inspection in the area of vendor interface including procurement control. Repetitive deficiencies in the use of commercial grade components in safety-related applications were identified. Similar problems had been identified during a previous NRC inspection. These findings indicate the licensee was not effectively correcting identified problems. Escalated enforcement is under consideration. These findings are discussed in more detail in Section IV.C of this report.

Hydrogen gas accumulation was reported by the license in the low head safety injection line (charging pump suction line) during March 1988. Historically, since 1979 the licensee experienced gas binding problems in the charging pumps on Unit 2 during testing and startup. In 1981 a proposal was made to install a vent from the 2B pump suction to the Volume Control Tank to correct the gas accumulation problem. In March 1982, the NSSS vendor recommended installing vents on both Unit 1 and 2 safety injection line. In January 1988, the proposal to install a vent on the 2B charging pump suction line was cancelled. The licensee had been aware of this problem since 1979 but had not instituted permanent corrective action other than running or venting the pump. The licensee was not aggressive in correcting this problem. Escalated enforcement action is under consideration.

No violations were identified.

2. Conclusion

Category: 2

3. Recommendations

Failure to identify and initiate strong corrective action in the areas of EQ and vendor programs indicate a significant weakness in QA and would have resulted in a lower rating had other functional areas not been so strong.

J. Licensing Activities

1. Analysis

During the assessment period, the licensee has once again continued to show a competent and dedicated management. Management is alert to issues involving plant safety and public health and safety. The management takes an active part in resolution of any problem in the normal licensing reviews. The licensee's submittals to the NRC are well thought out and follow-up is actively pursued.

The licensee's submittals are usually timely and very well prepared. The licensee submitted only three requests for changes to the Technical Specifications in support of the Unit 2 refueling outage, which ended in early December 1987. For these submittals, the staff had some difficulty in completing review of the two actions relating to steam generator tube sleeving and increasing the tube plugging limit. For example, the licensee's submittal for the sleeving required three supplemental submittals and numerous teleconferences to resolve NRC staff concerns. The submittal for an increase in the tube plugging limit also required three supplemental submittals prior to NRC acceptance. These issues were very technical in nature, among the first of a kind, and involved significant interface with the NSSS vendor.

Most applications submitted by the licensee during this SALP period were clearly well written with the safety analysis fully supporting the requested actions. Overall, we consider that the licensee continues to demonstrate a clear understanding and approach to resolving technical issues relating to licensing activities.

The licensee's management demonstrates active participation in licensing activities and keeps abreast of current and anticipated licensing actions. Management control and oversight of licensing activities is generally satisfactory. The licensee has adopted a computerized tracking and scheduling system that provides management an excellent tool for scheduling and prioritization of licensing activities initiated by their staff or by the NRC staff. This tool was used extensively in

assisting NRC in the initial updating of the Farley Safety Issues Management System. An awareness of scheduling control is evident in the licensing actions review schedule which is provided by the licensee to the NRC staff quarterly. Consequently, commitments to NRC requirements and responses to requests for information are usually implemented on time; and, when conditions preclude prompt implementation or response, a justification for the delay is provided.

The licensee management briefed the NRC staff on September 24, 1987, in Bethesda, Maryland to answer NRC concerns about the qualification of V-type electrical splices at Farley site. The briefing was a demonstration by licensee management of a clear understanding of the technical issues involved. Following the meeting, the licensee provided a written summary documenting their plan to resolve the issue. Subsequently, Region II issued a Confirmatory Action Letter prior to startup of Unit 2 on December 2, 1987. A subsequent team inspection of the entire equipment qualification area revealed weaknesses described in Section IV.I and IV.L. of this report.

The licensee consistently demonstrates a clear understanding and approach to evaluations to justify the no significant hazards consideration determination provided in accordance with 10 CFR 50.91. These evaluations are thorough and clearly sound and, in most cases, are used by direct quote in the Federal Register without change. This is a definite plus for the licensee's licensing management.

The licensee keeps abreast of industry approaches to the resolution of general plant safety issues and demonstrates an awareness of programs at other facilities. This has been accomplished through membership in most major utility advisory and owners' groups. Licensee management has been represented in leadership positions in many of these groups. The licensee has resolved most of the multi-plant safety issues. One example of excellent licensee responsiveness to NRC initiatives resulted in issuance of Technical Specification surveillance requirements for the Containment Ventilation System during this SALP period. The issue is a complex one where the NRC staff needed added assurance of leak tightness integrity and operability of certain containment vent valves. The licensee management, as well as site management, resolved the issue showing a conservatism necessary for this safety significant issue.

The licensing support activity has the additional voluntary burden of maintaining senior reactor operator qualifications for at least two key personnel. These trained and qualified managers continue to provide a very positive contribution in the

licensing activity. Thus, many operation's related questions from the NRC staff for information surveys or for information related to event occurrences are answered without an additional burden to the plant operations staff.

2. Conclusions

Category: 2

3. Recommendations

None

K. Training and Qualification Effectiveness

1. Analysis

During the assessment period, inspections were conducted by the resident and regional staffs. Inspections included two licensing examination site visits and one requalifications program evaluation. Assessment of training effectiveness were also made during the OPA noted previously.

The resident inspectors have had numerous occasions to inspect the training received by licensed and non-licensed personnel. The inspectors have observed simulator training and have reviewed the licensed operator requalification training material. The inspectors have observed and reviewed certain hands-on training at the training center and have reviewed instruction material for non-licensed personnel. The training center is state-of-the-art. The instructors are considered to be very proficient and well qualified in their positions The training programs which are prescribed for each craft are a required and continuing training evolution. Each program is an indepth coverage of all required work evolutions. Each training phase required craftsmen to successfully complete an examination on that portion of the training. The observed training has been professional, comprehensive and well received by personnel. Additionally, the ten program areas of training for plant personnel have been accredited by INPO.

The majority of the operators interviewed during the OPA indicated that both initial and requalification training were adequate and had improved substantially over the last two years. Interviews also indicated that the practice of operating crews attending requalification and simulator training as a crew enhanced the interface and teamwork within the crew. Simulator training was highly praised and operators indicated that plant specific events and emergency operating procedures (EOPs) were

well covered. Operators did indicate, however, that some initial and requalification training material contained incorrect information in relation to the as-built and as-operated plant. Although the interviews indicated that these errors did not significantly detract from the effectiveness of training, a feedback program did not include a method to notify the initiator that the material was revised; thus, closing the loop and encouraging additional operator responses.

The licensee rotates Senior Reactor Operators (SROs) through the Training Department. This practice enables a high experience level to be maintained among the instructional staff.

A training weakness in tagouts and independent verification appeared to contribute to repetitive operational errors. Concerns were identified with licensee's EQ training program. At the time of the inspection, licensee's supervisory and management staff had not been trained in the requirements of the EQ program.

Management training was identified as an area of strength. Most members of plant management hold current SRO licensees.

In March 1987, retake examinations were given to four operator candidates who had failed previous examinations. All four candidates passed. In August 1987, replacement examinations were given to 14 operator candidates. Examination results yielded an 80% (4 of 5) pass rate for Reactor Operator (RO) candidates and a 100% (9 of 9) pass rate for SRO candidates.

An evaluation of the Operator Requalification Program was conducted in June 1987. The overall program was rated as better than average as a result of 89% (16 of 18) of the operators tested passing the examination.

Items identified to the licensee as areas for improvement involved problems with various simulator models and the use of broad learning objectives in the licensed operator training program.

The licensee's general employee training program in radiological controls did not include instruction in the meaning of or controls for an exclusion area, the term the licensee applied to those high radiation areas that must have barricaded and locked access controls. In the evaluation of the event that led to the Severity Level III vilation in section IV.B, it was noted that the individual who entered the area with radiation levels in excess of 200 rem per hour, had not received formal training on

exclusion area controls. He had learned through on-the-job experience at the plant that such areas were special, but had not been given detailed instruction on the significance of or controls for such areas.

In addition, as noted in Section V.F, emergency offsite monitoring teams had not received proper instruction in procedures to be implemented after an emergency.

No violations were identified.

2. Conclusion

Category: 2

3. Recommendations

Although licensed operator training was exceptional, there were identified training deficiencies in other functional training areas. Therefore, the NRC staff resources applied to the routine inspection program should be maintained.

L. Engineering Support

1. Analysis

During the assessment period, several inspections conducted by resident, regional, and NRC Headquarters personnel were performed that provided an opportunity to review the engineering support discipline. These included three team inspections in the areas of environmental qualification for electrical equipment, the vendor interface and procurement programs, and an operational performance assessment. Other inspection findings contributed to the input to this functional area. It is recognized that engineering, like quality assurance, contributes to all functional areas.

A special team inspection was performed by the Headquarters staff to assess the licensee's vendor interface program and procurement. Two Severity Level III violations were identified and a civil penalty was proposed (see Inspection Report 50-348, 364/87-11). Corrective actions identified by plant staff for vendor technical information were not always implemented as evidenced by numerous examples cited in the inspection report. Repetitive failures in procurement control were evidenced by deficiencies in the procurement of safety-related components and in the dedication of commercial grade components for safety-related applications.

NRC inspections found that the licensee's program for EQ was marginal during the early development stages of the EQ program. Management developed a "mind-set" that they had implemented an adequate EQ program in spite of emerging NRC Notices and Generic Letters. This led to the lack of adequate and prudent actions being taken by APCO management in implementing an effective EQ program, including inadequate staffing, unqualified installed EQ equipment, failure to perform adequate walkdowns of EQ equipment, inadequate training on EQ, and a lack of understanding of EQ issues in general. The licensee's in-house capability on EQ was weak with extensive dependence placed on contractors. The licensee did not choose to join outside industry groups on EQ and did not keep pace with current EQ issues and perspectives. This may have been a contributor which led to the programmatic breakdown in the EQ area.

Several significant EQ deficiencies were identified, both by NRC and the licensee, which affected many systems and components. One safety deficiency involved extensive use of unqualified terminal blocks in instrumentation circuits inside containment. This concern resulted in shutdown of Unit 1 until necessary repairs in EQ circuits had been implemented. Additional deficiencies with EQ equipment were also corrected while both plants were operating. Deficiencies in the procurement area involved the purchase of commercial grade items for use in EQ applications. Additionally, the procurement program did not provide for the upgrade of equipment qualification in accordance with the requirements of 10 CFR 50.49(1). The potential violations identified are indicative of licensee management's previous lack of understanding of the issues surrounding equipment qualification.

Review of the licensee's response to IE Bulletin 85-03 "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings", indicated that corporate management was frequently involved in site activities and had a clear understanding of the issue. This is illustrated by the fact that a corporate representative had been temporarily assigned to Farley Nuclear Plant to manage the IEB 85-03 program, and that Corporate personnel were reviewing the IEB 85-03 test results. The licensee's proposed resolutions to the bulletin have been acceptable; however, supplemental responses were required. The licensee's response to this bulletin have been especially extensive in the areas of actuator thermal overload selection and actuator motor inspections.

The licensee demonstrated excellent engineering capability in evaluation and repair of the crack in a 6-inch safety injection system pipe. From the discovery of reactor coolant leakage

which led to the finding of the pipe-crack, to the final evaluation of the probable cause of the crack, the licensee conducted a well-thought-out analysis of the problem; followed by a comprehensive repair program. The licensee took the initiative to have the technical support people at the site maintain a daily dialogue with the RII Engineering Branch staff. This communication at the technical level assisted the NRC in the evaluation of the significance of the event, and also enabled the Region and NRR to coordinate the NRC coverage at the site and at the Westinghouse laboratory where the failed pipe was examined. The use of sound engineering practice in the systematic evaluation of the probable causes of the pipe failure, and the systematic review of the other similar safety injection piping in both Farley units, enabled the licensee and NRC to conclude with confidence that the cause of the failure had been identified and that Unit 1 could be safely operated until the next regularly schedule outage.

Licensee's handling of certain IE Notices was not always in a timely manner. IENs that did not recommend corrective actions were quickly closed out. Those that did recommend corrective action were not closed out in a timely manner. This had led to a backlog of approximately 78 incomplete IEN's with one IEN (83-56) dating back to 1983. The licensee did appear to have an effective tracking system so that IEN status could be easily identified.

The relationship between the site engineering groups and corporate engineering has been good. While the corporate engineering staff has been limited in size (there were approximately 35 engineers), the licensee maintained contract personnel on 24 hour call. The relationship between the corporate and site engineering groups and the dedicated contractor personnel is a strength.

An engineering/safety analysis of the gas entrapment problem was not adequately performed. As a result, in the post-accident cold-leg recirculation mode, the "A" Safety Inspection/Charging Pump suction trains on both units may have been effectively inoperable for several years with the potential to cause a catastrophic failure of the "A" and/or "B" charging pump and single train vulnerability of the "B" train crossover and long term deterioration of the charging pump. The failure to adequately perform and document an engineering/safety analysis related to the design deficiencies, equipment failures, and system operability; the decision not to implement corrective system modifications; and the failure to take adequate and timely corrective actions for safety-related system design deficiencies, test results, and equipment failures were identified as a weakness in engineering support.

It is recognized that significant engineering effort is performed for plant modifications. This includes evaluation of feasibility of design changes, initiation of plant change notice, material procurement, work planning and functional testing. This function has been observed to be well coordinated while providing complete work packages.

Three violations were identified. Additional potential violations from the EQ inspection are still under review.

a. Severity Level III violation for inadequate control and installation of purchased equipment (348,364/87-11).

b. Severity Level III violation for inadequate corrective actions and inspections (348,364/87-11).

c. Severity Level IV violation for inadequate post maintenance and design change verifications of control room fire dampers (348,364/87-14).

2. Conclusion

Category: 2

3. Recommendations

Licensee and NRC attention needs to be maintained in this area. Weaknesses and strengths were noted.

V. SUPPORT DATA AND SUMMARIES

A. Licensee Activities

During the assessment period, the licensee conducted major activities during the two refueling outages for Unit 1 and one refueling outage for Unit 2. One Unit 2 maintenance outage was performed to upgrade environmental qualifications (EQ) of electrical components. Significant EQ upgrade was performed during this period. Unit 2 had one forced outage due to the through wall crack on a six-inch safety injection line. Annual emergency preparedness exercises were performed in December 1986 and September 1987. INPO conducted an operations evaluation during February 1988.

B. Inspection Activities

During the assessment period, routine inspections were performed by the resident and regional inspection staffs. A regulatory effectiveness review report was issued. Special team inspections were conducted in the area of Vendor Interface and Procurement, Environmental Qualification, and an Operations Performance Assessment. Two emergency preparedness exercises were evaluated.

C. Licensing Activities

The assessment of licensing activities was based on the following NRR and licensee meetings and NRR site visits.

- SIMS Update at Site
- Enhance Communications with Licensee
- Snubber Technical Specifications
- Safeguards Modifications
- Equipment Qualification Splices
- 6-Inch Safety Injection Pipe Crack

The following NRR site visits used in the licensing assessment and other assessments during the SALP period.

Quarterly PM Visit starting 09/28/86
Unit 1 Refueling Outage for Cycle 8 starting 10/20/86
Quarterly PM Visit starting 2/09/87
Vendor Branch Team Inspection exit, ending 5/14/87
Management Meeting with Project Director ending 7/16/87
IST Team Review Meetings ending 8/27/87
EQ Team Inspection & Quarterly PM Visit ending 9/18/87
Unit 2 Refueling Outage for Cycle 6 ending 10/23/87
EQ Team Exit Interview (3 days) ending 11/20/87
Operation Assessment Team Inspection ending 3/09/88

The assessment on licensing activities was based on licensing actions that included the following license amendments issued, and reliefs and exemptions granted.

License Amendments

No. Unit 1/Unit 2	Title
65/58	Require 3-Loops in Mode 3
66/--	Delete fuel rod weight limit
67/59	Tech Specs for RTB's (GL83-28)
68/60	Increase Boron Limits
69/61	One-Time Snubber Inspection Change
70/62	Admin. Changes in 16 areas
71/--	Heatup/Cooldown Curves
--/64	F-Star Criteria for SG's
72/63	SG Tube Sleeving
73/65	SG Tube Plugging Limit to 10 Percent
74/66	Containment Ventilation Tech Specs
75/67	Historical Annual Average Met Data

Unit 1 ISI Indication on Cold Leg relief
Unit 1 & 2 ISI for SG Primary Nozzle relief

On December 29, 1986 the last of the several requested exemptions to Appendix R areas Fire Protection for Unit 2 and shared Unit 1 areas was granted.

D. Investigation and Allegations Review

Office of Investigations are reviewing a 1985 allegation of health physics related problems.

E. Enforcement History

During this SALP period, 59 inspections resulted in violations as shown in Section V.H. One severity level III violation and two severity level III problems were identified. The Severity Level III violation involved failures to adequately control access to a high radiation area, failures to comply with procedures for access control to radiation areas including a radiation work permit system, and failure to adequately instruct individuals on the limitations and precautions for working in or frequenting a restricted area. Due to the prior good performance in this area the Severity Level III violation was issued without a civil penalty. The remaining two Severity Level III problems were regarding the implementation of the procurement and vendor interface program. The licensee denied part of each problem. A $50,000 civil penalty has been proposed for the two Severity Level III problems. Two other potential enforcement cases are being considered on EQ and hydrogen buildup in the charging pump/RHR system piping. Confirmation of Action letters were issued on October 6, 1987, for Unit 2 and December 2, 1987 for Unit 1 regarding equipment qualification issues.

F. Enforcement Conferences Held During Appraisal Period

1. Enforcement Conference at Region II relating to the equipment qualification issues - 3/15/88

2. Enforcement Conference at Region II relating to the Potential Overexposure - 2/17/88

3. Enforcement Conference at Region II relating to the Procurement and vendor interface program - 9/3/87

4. Enforcement Conference at Region II relating to the mispositioning of the RHR suction isolation valve - 2/10/87

5. Enforcement Conference at Region II relating to shipment of contaminated snubbers - 12/22/86

G. Licensee Event Reports (LERs)

During the assessment period, there were 39 LERs reported for Unit 1 and 17 LERs reported for Unit 2. The LER reports were thorough,

detailed, well written and easy to understand. The narrative sections typically included specific details of the event such as valve identification numbers, model numbers, number of operable redundant systems, the date of completion of repairs to provide a good understanding of the event.

LERs presented the event information in an organized pattern with separating headings and specific information in each section that led to a clear understanding of the event information. Previous similar occurrences were properly referenced in the LERs as applicable.

The licensee updated some LERs during the assessment period. The updated LERs provided new information and the portion of the report that was revised was denoted by a vertical line in the right hand margin so the new information could easily be determined by the reader.

The licensee submitted several reports and updates on a voluntary basis during the assessment period. As stated on page 10 of NUREG-1022, licensees are encouraged to report any event that does not meet reporting criteria if the licensee believes that the event might be of safety significance, might be of generic interest or concern, or contains a lesson to be learned.

A review of LERs does not in general indicate any trend that the plants are subject to recurring problems. Recently the licensee has developed a program to trend personnel errors and repetitive equipment failures. The OPA team noted that all corrective actions taken were not listed in the LER and therefore, were not always correct. Licensee evaluations did not always show that the root cause was trended or pursued.

The distribution of the events analyzed by cause by the licensee were as follows:

Cause	Unit 1	Unit 2
Component Failure	8	5
Design	7	3
Construction, Fabrication, or Installation	6	2
Personnel		
- Operating Activity	5	1
- Maintenance Activity	4	4
- Test/Calibration Activity	3	4
- Other	6	-
Out of Calibration	-	-
Other		-
TOTAL		17

SITE TOTAL 56

H. Inspection Activity and Enforcement

FUNCTIONAL AREA	NO. OF VIOLATIONS IN EACH SEVERITY LEVEL					
	V	IV	III	II	I	DEV
Unit No.	1/2	1/2	1/2	1/2	1/2	1/2
Plant Operations		4/4				
Radiological Controls	1/1	3/4	1/1			
Maintenance	1/2	4/2				1/1
Surveillance		4**/3				
Fire Protection	2/2	1/1				
Emergency Preparedness		1/1				
Security		1/1				
Outages						
Quality Program and Administrative Controls Affecting Quality						
Training						
Engineering		1/1	2*/2*			
TOTAL	4/5	19/17	3*/3*			1/1

*Two Severity Level III problems, consisting of two violations each; vendor inspection (87-11) partially denied; NRC reviewing.

**Severity Level IV violation involving containment penetrations (86-25) was denied. NRC reviewing.

I. Reactor Trips

Unit 1

08/05/86 The reactor tripped at 99% reactor power due to low water level in 1C steam generator coincident with feedwater flow being less than steam flow. The steam generator low level trip was caused by a reduction in feedwater flow to the 1C steam generator due to a failed printed circuit card in the controller for 1C steam generator main feedwater regulating valve. The failed printed circuit card was replaced and the unit was returned to service on 08/06/86.

01/09/87 During restart the reactor tripped from 20% power due to lo-lo steam generator level following the manual tripping of the main turbine. The main turbine was tripped because both steam generator feed pumps (SGFP) had tripped due to low suction pressure. The reactor trip was caused by personnel error in that the operators failed to adequately monitor the SGFP

suction pressure and take appropriate action to prevent SGFP suction pressure from decreasing below the trip setpoint for SGFP.

01/22/87 A reactor trip occurred from 100% power due to high flux rates indicated by power range nuclear instrumentation channels N-41 and N-42. The high flux rate on N-42 was due to testing which was in progress at the time. The high flux rate on N-41 was caused by the failure of the 1A inverter which supplies power to N-41. The unit returned to power operation on 01/23/87. Subsequently, the 1A inverter was tested and four blown fuses were replaced. No cause for the blown fuses could be found.

05/14/87 The reactor tripped from 100% power due to steam flow greater than feedwater flow coincident with low steam generator level. Surveillance testing was in progress on the 1-2A diesel generator and the diesel generator was connected to the 1F 4160 volt bus. Upon completion of the surveillance, the operator intended to open the diesel generator output breaker. However, he inadvertently opened the breaker which supplies power to the 1H 4160 volt bus. This caused deenergization of the load center which powers the AC oil pumps for both steam generator feed pumps. The DC oil pumps for both feedwater pumps started and provided oil to the feed pumps bearings. By design, the DC oil pumps do not supply control oil. Thus, the feedwater pumps tripped. The loss of feedwater flow led to the reactor trip.

Unit 2

08/04/86 The reactor tripped from 99% power when both trains of the solid state protection system (SSPS) received indication of a "General Warning". A general warning existed on the A train because the A train reactor trip bypass breaker had been closed as part of a SSPS operability testing. When the A train reactor trip bypass breaker was opened, SSPS momentarily received a general warning on the B train due to a faulty secondary disconnecting contact on the B train reactor trip bypass breaker. General warnings on both trains caused the reactor to trip. The secondary disconnecting contacts for both the reactor trip and the reactor trip bypass breakers have been replaced as needed. The unit was returned to service on 08/05/86.

02/28/87 The reactor tripped from 100% power due to over-temperature-delta-T (OT-Delta-T). Channel three of OT-Delta-T was in test for surveillance testing with the bistable tripped. The indicated TAVG in channel one increased (due to an apparent intermittent failure in a lead-lag card) causing the variable OT-Delta-T setpoint to decrease to the actual delta-T value. This resulted in the required two-out-of-three coincidence on OT-Delta-T and initiated the reactor trip. The unit was returned to power operation on March 1, 1987. The lead-lag card was subsequently replaced.

12/03/87 The reactor tripped from 1.5% power due to low water level in the 2A steam generator coincident with feedwater flow being less than steam flow. The reactor trip was caused by personnel error in that the operator allowed the steam generator level to decrease to the trip setpoint.

1. Effluent Summary for Farley

Activity Released (curies)	1985	1986	1987
1. Gaseous Effluents			
Fission and Activation Products	2.37 E+3	3.12 E+3	2.02 E+3
Iodine and Particulates	5.93 E-3	2.15 E-3	5.30 E-4
2. Liquid Effluents			
Fission and Activation Products	7.08 E-2	1.85 E-1	9.72 E-2
Tritium	1.11 E+3	1.34 E+3	1.14 E+3
Dose Estimate (mRem)			
Maximum Whole Body Dose Offsite	1.6 E-1	1.8 E-1	1.6 E-1
Maximum Organ Dose Offsite	1.8 E-1	1.4 E-1	1.7 E-1