

U.S. NUCLEAR REGULATORY COMMISSION

REGION V

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE

PORTLAND GENERAL ELECTRIC COMPANY

TROJAN NUCLEAR PLANT

ASSESSMENT PERIOD: JULY 1, 1981 THROUGH AUGUST 31, 1982

ASSESSMENT CONDUCTED: OCTOBER 19, 1982

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I. INTRODUCTION

1. Purpose and Overview

The Systematic Assessment of Licensee Performance (SALP) is an integrated NRC staff effort to collect available observations on an annual basis and evaluate licensee performance based on those observations with the objectives of improving the NRC Regulatory Program and Licensee performance.

The period of this assessment was July 1, 1981 through August 31, 1982. Evaluation criteria used during this assessment are discussed in Section III below. Each criterion was applied using the "Attributes for Assessment of Licensee Performance" contained in NRC Manual Chapter 0516.

2. SALP Board Meeting: October 19, 1982, Region V Office

Board Members:

D. M. Sternberg, Chief, Reactor Projects
Branch No. 1 (Board Chairman)
R. T. Dodds, Chief, Reactor Projects
Section No. 1
G. B. Zwetzig, Chief, Engineering Programs Section
M. Cillis, Radiation Specialist, Region V
R. F. Fish, Emergency Preparedness Analyst,
Region V
P. H. Johnson, Reactor Inspector, Region V
M. H. Malmros, Senior Resident Inspector,
Trojan Nuclear Plant
C. Schwan, Physical Security Inspector, Region V
C. M. Trammell, Licensing Project Manager, NRR
W. J. Wagner, Reactor Inspector, Region V

Other Attendees:

M. D. Schuster, Chief, Physical Security Section

3. Licensee Activities

Cycle 4 operation began with reactor startup on July 4, 1981 following a nine-week refueling outage. Power operation resumed on July 17. The operating cycle continued until March 26, 1982, when the plant was shut down for its annual refueling outage. The outage began approximately one month earlier than scheduled because of abundant hydroelectric power in the region. Tabulations of reactor trips and safety injection actuations are presented in Tables 1 and 2.

Reactor coolant activity began to increase in August 1981 and continued to do so throughout the operating cycle. Dose equivalent iodine concentration reached a level of 75 to 85 percent of the Technical Specifications limit shortly before

the refueling outage began. Gross gamma activity reached 45 to 50 percent of its limit at about the same time. Fuel inspections conducted during the outage determined the cause to be failure of fuel rods in the periphery of the core resulting from the impingement of water jets through gaps in the core baffle. Early termination of the operating cycle because of hydroelectric conditions allowed extra time to be given to coolant cleanup before refueling, which helped to minimize the radiological consequences of the fuel failures.

Visual observation of fuel assemblies during the refueling outage identified eight severely damaged fuel assemblies from locations adjacent to the core baffle. Nine other assemblies with less obvious damage were identified by fuel sipping. Modified fuel assemblies with 3 to 5 stainless steel rods each were inserted into these positions for Cycle 5. During the outage it was also determined that thermal sleeves from the four safety injection lines had become detached and were in the bottom of the reactor vessel. These were removed, and the pressurizer surge line was cut to remove a thermal sleeve in the surge line nozzle.

Cycle 5 operation began with criticality on August 21, 1982. The plant resumed power operation on August 23.

4. Inspection Activities

Two NRC resident inspectors were onsite for approximately the first half of the SALP period. One resident inspector was onsite during the second half of the period.

A total of 44 resident inspector and region-based inspections were conducted, involving approximately 3300 inspector hours. A summary of inspection activities is provided in Table 3. A listing of inspections conducted is provided in Table 4.

Enforcement items identified during this SALP period are summarized in Table 5 and listed in Table 6.

II. SUMMARY OF RESULTS

| <u>Functional Areas</u> | <u>Category 1</u> | <u>Category 2</u> | <u>Category 3</u> |
|---|-----------------------|-----------------------|-----------------------|
| 1. Plant Operations | | X | |
| 2. Radiological Controls | X | | |
| ● Radiation Protection | | | |
| ● Radioactive Waste Management | | | |
| ● Transportation | | | |
| ● Effluent Control and Monitoring | | | |
| 3. Maintenance | X | | |
| 4. Surveillance (Including Inservice Inspection) | | X | |
| 5. Fire Protection and Housekeeping | | X | |
| 6. Emergency Preparedness | X | | |
| 7. Security & Safeguards | X | | |
| 8. Refueling | X | | |
| 9. Licensing Activities | X | | |
| 10. Design Changes and Modifications | X | | |
| 11. Review and Audit | | X | |

III. CRITERIA

The following evaluation criteria were applied to each functional area:

1. Management involvement 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 effectiveness and qualification.

To provide consistent evaluation of licensee performance, attributes associated with each criterion and describing the characteristics applicable to Category 1, 2, and 3 performance were applied as discussed in NRC Manual Chapter 0516, Part II and Table 1.

The SALP Board conclusions were categorized as follows:

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 such 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 are reasonably effective such 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 strained or not effectively used such that minimally satisfactory performance with respect to operational safety is being achieved.

IV. PERFORMANCE ANALYSIS

1. Plant Operations

Inspections of plant operations have been performed on a monthly basis throughout the SALP evaluation period by the Resident Inspectors and periodically (seven inspections) by region based inspectors. As a result of these inspections certain strengths and weaknesses have been identified. The identification and resolution of conditions adverse to quality continues to be a licensee strength. The potentially reportable occurrence program and the plant problem reports continue to focus management attention on areas of concern. Reportable occurrences have been promptly submitted and generally describe a sound and acceptable resolution of each reportable event. The staffing and training of the operations department with respect to licensed operators has been excellent. Initial license candidates have continued the high pass rate during the past year, with only one candidate failing to obtain a license on his first NRC-administered examination.

Enforcement actions in the plant operations area consisted of two Severity Level III violations. One violation was related to the extended inoperability of an emergency diesel generator under certain electrical system alignments. The other violation was related to the blocking of both trains of safety injection automatic actuation logic during the escalation from mode 5 to mode 3 following the 1982 refueling outage. These violations were attributed to weaknesses in the licensee's management controls for corrective actions and in procedures for the control and verification of equipment operability. They were discussed with the licensee in enforcement conferences, and one culminated in a civil penalty.

The licensee submitted 23 Licensee Event Reports (LERs) attributed to the plant operations area. Evaluation of these LERs indicated that several events resulted from operator error. The board concluded, however, that these did not represent an unusually high number of such events or an overall weakness in management controls for plant operations. At an enforcement conference held on October 7, 1982, licensee management stated that it recognized a need to evaluate the various aspects of facility operation to minimize the operator error occurrence rate. The NRC will be examining the licensee's corrective actions in this area.

Conclusion

Performance Assessment - Category 2.

Board Recommendations

The Board recommends no change in inspection effort.

2. Radiological Controls

A total of nine inspections were performed by the Reactor Radiation Protection Section during the appraisal period. The areas inspected, which involved a total of 346 inspection hours, included:

- a. Radiation protection during normal operations and refueling outages.
- b. Confirmatory measurements.
- c. Management of gaseous and liquid radioactive waste.
- d. Radiological Environmental Monitoring Program.
- e. Transportation activities.

The NRC resident inspector also gave frequent attention to these areas. No violations or deviations were identified during the appraisal period. The only LER related to this area was LER 82-03, which involved the failure of a radiation monitor pump.

The inspections reflected that the licensee is continuing to demonstrate a strong commitment to the radiation protection program. Actions were implemented to strengthen the radiation protection, radioactive waste management and environmental monitoring programs. These actions included: (1) the assignment of an effluent analyst for liquid and gaseous waste management, (2) the assignment of a PhD level health physicist responsible for the dosimetry, respiratory protection and radiological environmental monitoring programs, and (3) establishment of an effective ALARA program. Areas that showed a need for improvement include general employee training, maintenance of exposure and training records, reducing the number of clothing/skin contamination occurrences, and scheduling for the installation and operation of certain TMI action items, such as the post accident sampling system.

The Region V office has some concerns regarding the consequences that may result from the recent fuel failures. The effects resulting from the fuel failures and the impact they may have on the radiation protection program are difficult to predict. Therefore, although the licensee has maintained an effective radiation protection program during this rating period, a continued high level of attention to this area will be required for some time.

In general, management has demonstrated a constant awareness of the need for effective radiation protection programs and for implementing improvements that are consistent with or exceed regulatory requirements.

Conclusion

Performance Assessment - Category 1.

Board Recommendation

In view of continued high coolant activity levels, the Board recommends no change in inspection effort.

3. Maintenance

Maintenance activities have been inspected on a monthly basis by the Resident Inspectors; two inspections of maintenance activities were also performed by region based inspectors during this SALP evaluation period. These inspections have verified that the licensee's maintenance program, both corrective and preventive, has been effective in assuring the operability of safety related equipment. A significant maintenance effort related to the removal and retrieval of reactor coolant system thermal sleeves was accomplished without incident during the 1982 refueling outage by licensee personnel.

One violation (severity level V) was identified during the SALP period related to the revision of maintenance procedures as a result of plant design changes. Licensee Event Reports (LER's) attributed to maintenance activities revealed a minor weakness in the control of maintenance when performed by personnel from other than the normal plant maintenance organization. Another weakness identified was related to the disassembly and reassembly of installed pipe supports when performing plant maintenance or modifications. Both of the weaknesses were promptly corrected with appropriate instructions to maintenance personnel.

Conclusion

Performance Assessment - Category 1.

Board Recommendations

The Board recommends no change in inspection effort.

4. Surveillance

The surveillance program has been inspected on a routine basis by the Resident Inspectors throughout the SALP period. One region-based inspection of inservice inspection activities was also conducted. Activities performed by the licensee which are included in the surveillance program include inservice inspection and all surveillance activities required by the technical specifications and performed in accordance with periodic calibration, operational and engineering test procedures. The program has been well implemented and has provided for the completion of required surveillance activities. Problems identified by the licensee as a result of surveillance activities have been documented and promptly resolved.

There were no enforcement actions taken by the NRC with respect to surveillance activities during this SALP period. Licensee Event Reports (LER's) have identified certain weaknesses in some of the surveillance procedures. These weaknesses have led to some of the operator error concerns expressed in the analysis of plant operations. Some procedures need to more clearly describe and control the return of safety related equipment to service following the surveillance activity. Reviews of surveillance procedures are being performed by the licensee to resolve this NRC concern. One LER identified a missed surveillance when scheduling errors were made. The assignment of responsibility for operational surveillances to one key person has improved the scheduling of surveillance activities.

Conclusion

Performance Assessment - Category 2.

Board Recommendations

The Board recommends no change in inspection effort.

5. Fire Protection

Two inspections of fire protection activities were conducted during the assessment period. These inspections covered administrative controls associated with fire protection; completion of related surveillance and inspection; completion of required modifications; and fire brigade staffing and training. One Severity Level V violation was identified associated with administrative controls over nonemergency use of fire hoses. Another Severity Level V violation was identified during a later inspection regarding implementation of these controls.

The licensee reported inoperable fire barriers or equipment on six occasions. Five of these cases involved deliberate inoperability necessitated by plant modifications, with required backup actions taken. The other report discussed fire barrier discrepancies identified by the licensee's semi-annual surveillance inspection.

Inspections conducted have shown the licensee to have an effective fire protection program. Plant housekeeping is consistently excellent, which also contributed to fire safety. A number of weaknesses identified by the QA audit program and the NRC inspection program received effective corrective action. Fire protection modifications were also judged to have been implemented in a timely and professional manner.

Conclusion

Performance Assessment - Category 2.

Board Recommendations

The Board recommends no change in inspection effort.

6. Emergency Preparedness

An appraisal of the licensee's state of onsite emergency preparedness was performed during the period of this assessment. This appraisal, which involved over 400 hours of inspection effort, disclosed strong management support for emergency planning. No significant deficiencies were identified, and the licensee was judged to be attentive to NRC emergency preparedness requirements. A few minor observations were made regarding possible program improvements, to which the licensee has been responsive. The appraisal concluded that a high level of emergency preparedness exists at the Trojan site.

Conclusion

Performance Assessment - Category 1.

Board Recommendation

The Board recommends no change in inspection effort, particularly in view of the revised IE inspection program to be implemented in this area in the near future.

7. Security and Safeguards

From July 1, 1981 through August 31, 1982, Region V conducted eight Safeguards inspections at the Trojan Nuclear Plant. Three inspections were physical security, and five were material control and accounting (MC&A).

Physical security inspections during the SALP period showed licensee management to be actively involved in the security program. Staffing of the security organization was judged to be adequate, and an effective program for the reporting and analysis of reportable events was in place. The licensee was also commended during this period for the implementation of an excellent security training program.

One violation (Severity Level IV) of physical security requirements was identified during the assessment period, pertaining to failure to maintain a security barrier. The licensee subsequently identified other security barrier deficiencies which were corrected in conjunction with the inspection finding. The inspection reports for this review period indicate several inspection findings which remained outstanding for extended periods of time, including slow response to QA audit findings. The slow resolution of these outstanding items was primarily a result of vendor delays; however, several items open for extended periods of time involved actions within the licensee's control. Increased management attention has significantly improved response and completion times for corrective actions.

Four of the five MC&A inspections during this period were conducted to accompany and observe IAEA inspectors during their inspections of the licensee's facility. Trojan was one of the two U.S. nuclear power plants selected for IAEA inspection under the President's offer of 1967. Although this participation was not required, the licensee has been cooperative in responding to IAEA and related NRC initiatives. The other MC&A inspection was the facility's routine triennial inspection. No violations were identified, although one observation regarding a fuel handling procedure was noted for followup during a future inspection.

In evaluating the licensee's activities in the safeguards area, the Division of Safeguards, NMSS, stated that responses demonstrate prior planning, assignment of priorities, and adequate management review. Responses were timely, demonstrated an understanding of safety/safeguards issues, and have resulted in few longstanding issues attributable to the licensee. The Division of Safeguards also found management positions at the

corporate and plant levels to be filled by well qualified individuals who demonstrate professionalism and expertise. The training program was considered to provide a solid understanding of the applicable security procedures and duties.

Conclusion

Performance Assessment - Category 1.

Board Recommendations

The Board recommends no change in inspection effort.

8. Refueling

The 1982 refueling outage began in March and was completed in August for an outage duration of approximately five months. During this period, inspections of refueling activities were conducted by both the Resident Inspector and region based inspectors. The refueling was well planned and scheduled, which assured the proper sequencing of all activities consistent with technical specifications requirements. The reactor fuel was handled without mishap during the complete core unload, fuel sipping evolution, and core reload. The reactor vessel lower internals were removed from the vessel twice to permit removal of thermal sleeves and failed fuel debris from the lower reactor vessel. Each of the major refueling evolutions was controlled by the use of approved procedures by qualified personnel.

No enforcement actions were taken with respect to refueling activities performed during the 1982 outage. One Licensee Event Report originated as a result of refueling activities when the spent fuel pool level was inadvertently lowered due to a valve line-up error. The level decrease was immediately detected by the licensee and corrected.

Conclusion

Performance Assessment - Category 1.

Board Recommendations

The Board recommends no change in inspection effort.

9. Licensing Activities

The assessment of the licensee's performance in this area was conducted by the Office of Nuclear Reactor Regulation (NRR) based upon experience with a wide variety of licensing issues which involved a significant amount of NRR staff manpower. The performance attributes most prominent in the assessment of this functional area were management involvement, approach to resolution of safety issues, and responsiveness.

Strong management involvement in licensing activities has been evidenced in the fact that Trojan has a comparatively low number of unresolved multi-plant actions and no important plant-specific unresolved actions. Typical areas in which management involvement was evident were responses to NUREG-0737 and actions taken to meet requirements for auxiliary feedwater improvements. With few exceptions (improved snubber technical specifications and radiological effluent technical specifications), the licensee has demonstrated responsible and responsive performance in resolving safety issues and responding to NRC initiatives. Noteworthy in this regard were the timeliness and quality of Trojan's first updated FSAR submitted pursuant to the requirements of 10 CFR 50.71(e).

From NRR's standpoint, the licensee's performance with regard to staffing and training is judged to be good based upon the pass rate in NRC-administered operator licensing examinations. The one set of exams administered during this period included written, plant walk-through, and simulator exams. Of six reactor operator and two senior reactor operator candidates examined, only one RO candidate failed to obtain a license. These passing rates of 83 percent (ROs) and 100 percent (SR0s) indicate training received by this group to have been appropriately defined and implemented.

Conclusion

Performance Assessment - Category 1.

Board Recommendations

Continue existing licensing regulatory relationships.

10. Design Changes and Modifications

Design changes and modifications were examined during four region-based inspections. Modification activities were also observed by the Senior Resident Inspector on various occasions. One region-based inspection identified a Severity Level V violation associated with documentation of a completed plant modification. One Severity Level III violation partially involved design change activities which occurred in 1977-1978, but this occurrence does not appear to be relevant to the licensee's design program as it exists today.

Only one LER during the assessment period was deemed by the SALP Board to be related to the design control area. This was LER 81-21, which reported inadequate ventilation for a portion of a switchgear room as the result of the installation of a fire barrier.

Inspection and review of design control and modifications activities during the period of this assessment have shown the licensee to have a strong program. Design changes have been well reviewed and engineered with consideration of the safety issues involved. Approved methods and procedural controls have been evidenced in the installation of modifications. Upper management involvement has also been evidenced in the licensee's willingness to provide necessary funds for important design changes, with the result that fire protection, TMI, and other significant plant modification efforts have, with few exceptions, been completed in a timely manner.

Conclusion

Performance Assessment - Category 1.

Board Recommendations

The Board recommends no change in inspection effort in view of a number of TMI and other significant modifications yet to be installed.

11. Review and Audit

Review and audit activities were directly examined during two inspections. Region-based and resident inspectors also examined this area on a number of occasions because of its prominent involvement in other functional areas. No violations associated with review and audit were identified by these inspection activities, although four enforcement items initially identified during the January-February 1981 Performance Appraisal inspection were cited as violations during this assessment period.

The only LER associated with the review and audit area was LER 81-32, which involved inadvertent deletion of a required surveillance verification during revision of a surveillance test procedure.

Inspections have shown the licensee's review and audit programs to be effective. Both the Plant Review Board and the Nuclear Operations Board are staffed with qualified individuals, and reviews are judged to give proper consideration to safety issues. Several improvements in methods and procedures were observed to have been made in this area, partially as a result of observations made by the Performance Appraisal Team. Inspections showed that quality-related activities were being audited properly. The licensee is currently developing a clearer definition of audit program scope and the methods to be used in evaluating the effectiveness of the quality assurance program.

Conclusion

Performance Assessment - Category 2.

Board Recommendations

The Board recommends no change in inspection effort.

V. SUPPORTING DATA AND SUMMARIES

1. Licensee Event Reports

Licensee event reports (LERs) were submitted for 35 reportable events which occurred during the SALP period. A synopsis of these is included as Table 7, and the LERs are listed in Table 8.

Four causally linked events are identified in Table 8 (a causally linked event is one having the same root cause as one which occurred earlier). Corrective actions had been taken by the licensee following the earlier event in each case, but were not completely effective. However, this number of causally linked events compares favorably with other domestic nuclear power plants, and is not considered to indicate overall problems in the licensee's corrective action systems.

2. Part 21 Reports: None

3. Investigations and Allegations:

No investigations were initiated during this SALP period. Four cases (based on allegations received prior to this SALP period) were closed because the allegations were determined to be unfounded or were withdrawn.

4. Escalated Enforcement Actions:

a. Civil Penalties:

June 2, 1982 - Ineffective corrective actions and resulting diesel generator inoperability (Inspection Report No. 50-344/82-12).

b. Orders: None

c. Confirmation of Action Letters:

June 18, 1982 - Resolve problem regarding degraded thermal sleeve components (in Reactor Coolant System) prior to startup.

5. Management Conferences Held During SALP Period:

March 10, 1982 - Management meeting to discuss results of 1980-1981 SALP review (Inspection Report No. 50-344/82-03).

May 7, 1982 - Enforcement conference regarding ineffective corrective actions and resulting diesel generator inoperability (Inspection Report No. 50-344/82-19; also see item 4.a above).

October 7, 1982 - Enforcement conference regarding inoperability of automatic safety injection actuation logic (Inspection Report No. 50-344/82-26). (Note: Although this conference was conducted after the SALP period, it related to events which occurred during the period).

TABLE 1 - REACTOR TRIPS

July 1, 1981 through August 31, 1982

| <u>Date</u> | <u>Cause</u> |
|-------------|---|
| 7/8/81 | Turbine trip during overspeed trip test. |
| 7/10/81 | Low pressurizer pressure trip following rapid power reduction to 10 percent (because of high temperature and concurrent oil reservoir alarm on "B" reactor coolant pump). |
| 7/17/81 | Manual reactor trip following main feed pump trip. |
| 7/30/81 | Lo-lo level in "B" steam generator (worker inadvertently hit solenoid, caused "B" MSIV to close). |
| 8/9/81 | Turbine trip (loss of vacuum resulting from trip of circulating water pump). |
| 8/10/81 | Turbine trip (loss of vacuum resulting from trip of circulating water pump). |
| 10/4/81 | Failure of current sensing relay on inverter Y15 caused loss of power to Preferred Instrument Bus Y11. This affected the main feed pump control system, which caused turbine/reactor trip on Hi-Hi steam generator level. |
| 10/12/81 | Instrument Technician drew an arc while replacing a lead. This caused a sequential trip of both main feed pumps, and the reactor tripped on low steam generator level. |
| 10/22/81 | Technician inadvertently caused bus lockout on 12 kv bus supplying power to "A" and "C" reactor coolant pumps. |
| 10/23/81 | Low-Low level in "D" steam generator due to difficulty of controlling in manual at low power. |
| 10/30/81 | Burned out solenoid coil caused "D" feed regulating valve to close, resulting in trip on low steam generator level with feed flow/steam flow mismatch. |
| 1/9/82 | Manual trip due to failure of piping elbow in 18-inch turbine extraction steam line. |
| 1/12/82 | Manual trip due to failure of No. 2 inverter and loss of instrument bus Y22. |
| 1/16/82 | Safety injection actuation signal resulting from failure of No. 2 inverter. |
| 2/4/82 | Low-Low level in "A" steam generator due to difficulty of controlling in manual at low power. |

TABLE 2 - SAFETY INJECTION ACTUATIONS

July 1, 1981 through August 31, 1982

| <u>Date</u> | <u>Cause</u> |
|-------------|---|
| 1/12/82 | Transfer of instrument bus Y22 caused trip of high steam flow bistables (with Tave less than 553 ⁰ F). |
| 1/16/82 | No. 2 inverter failed while the plant was at 100 percent power. Steam dump valves opened, giving high steam flow concurrent with low steam line pressure. |

TABLE 3 - SUMMARY OF INSPECTION ACTIVITIES (7/1/81 - 8/31/82)

TROJAN NUCLEAR PLANT

| <u>Functional Area</u> | <u>Inspection*</u> <u>Hours</u> | <u>Percent</u> <u>of Effort</u> |
|--------------------------------------|------------------------------------|------------------------------------|
| 1. Plant Operations | 1667 | 50 |
| 2. Radiological Controls | 346 | 11 |
| Radiator Protection - 82 | | |
| Radioactive Waste Management - 142 | | |
| Transportation - 28 | | |
| Effluent Control and Monitoring - 94 | | |
| 3. Maintenance | 188 | 6 |
| 4. Surveillance | 192 | 6 |
| 5. Fire Protection | 49 | 1 |
| 6. Emergency Preparedness | 435 | 13 |
| 7. Security and Safeguards | 266** | 8 |
| 8. Refueling | 38 | 1 |
| 9. Licensing Activities | - | - |
| 10. Design Changes and Modifications | 87 | 3 |
| 11. Review and Audit | <u>35</u> | <u>1</u> |
| Total | 3303 | 100 |

* Allocations of inspection hours vs. functional areas are approximations based upon inspection report data.

** Includes 53 hours observation of IAEA inspection activities.

TABLE 4 - INSPECTIONS CONDUCTED (7/1/81 - 8/31/82)

| <u>TROJAN NUCLEAR PLANT</u> | | | |
|-----------------------------|---------------|--------------------------|---------------------------------------|
| <u>Report No.</u> | <u>Dates</u> | <u>Inspector(s)</u> | <u>Areas Inspected</u> |
| 81-17 | 7/6-10/81 | Operations | Procurement, Plant Operations |
| 81-19 | 7/1-31/81 | Resident | Routine |
| 81-20 | 7/27-31/81 | Construction | Modifications |
| 81-21 | 8/10-11/81 | Safeguards | Material Control and Accounting* |
| 81-22 | 8/3-31/81 | Safeguards | Physical Security |
| 81-23 | 8/3-31/81 | Resident | Routine |
| 81-24 | 8/17-26/81 | Operations | Operations, Maintenance, Housekeeping |
| 81-25 | 9/8-16/81 | Radiation Specialist | Radwaste Systems |
| 81-26 | 9/1-30/81 | Resident | Routine |
| 81-27 | 10/5-9/81 | Radiation Specialist | Radwaste Systems, Effluent Control |
| 81-28 | 10/1-30/81 | Resident | Routine |
| 81-29 | 10/27/81 | Independent Measurements | Effluent Control and Monitoring |
| 81-30 | 11/2-6/81 | Operations | Fire Protection, Committee Activities |
| 81-31 | 11/30-12/1/81 | Safeguards | Material Control and Accounting* |
| 81-32 | 11/18-27/81 | Safeguards | Material Control and Accounting |
| 81-33 | 11/1-30/81 | Resident | Routine |
| 81-34 | 12/7-16/81 | Operations | QA Audits, Nuclear Operations Board |
| 81-35 | 12/1-31/81 | Resident | Routine |

Table 4 (Cont'd)

| <u>Report No.</u> | <u>Dates</u> | <u>Inspector(s)</u> | <u>Areas Inspected</u> |
|-------------------|--------------|--------------------------|---|
| 82-01 | 1/25-29/82 | Safeguards | Physical Security |
| 82-02 | 1/12-14/82 | Independent Measurements | Laboratory QC Program |
| 82-03 | 3/10/82 | Regional Management | Management Conference (SALP) |
| 82-04 | 1/11-14/82 | Radiation Specialist | Radiation Protection |
| 82-05 | 1/4-29/82 | Resident | Routine |
| 82-06 | 2/22/82 | Emergency Planning | Emergency Preparedness |
| 82-07 | 3/10-11/82 | Safeguards | Material Control and Accounting* |
| 82-08 | 2/1-26/82 | Resident | Routine |
| 82-09 | 2/8-12/82 | Independent Measurements | Reactor Coolant Activity Measurements |
| 82-10 | 3/30-4/16/82 | Operations | Procedures, Fire Protection |
| 82-11 | 4/28-29/82 | Safeguards | Material Control and Accounting* |
| 82-12 | 3/16-4/30/82 | Resident | Diesel Generator Inoperability |
| 82-13 | 4/18-22/82 | Safeguards | Physical Security |
| 82-14 | 3/1-4/16/82 | Resident | Routine |
| 82-15 | 4/19-23/82 | Radiation Specialist | Radiation Protection |
| 82-16 | 5/3-7/82 | Construction | Inservice Inspection |
| 82-17 | 5/25-28/82 | Operations | Design Changes and Modifications, Licensed Training |
| 82-18 | 4/19-5/28/82 | Resident | Routine |

Table 4 (Cont'd)

| <u>Report No.</u> | <u>Dates</u> | <u>Inspector(s)</u> | <u>Areas Inspected</u> |
|-------------------|--------------|-------------------------|---|
| 82-19 | 5/7/82 | Regional Management | Enforcement Conference |
| 82-20 | 6/18-7/2/82 | Resident | Routine |
| 82-21 | 7/12/82 | Construction | Welding Control |
| 82-22 | 7/6-9/82 | Radiation Specialist | Packaging and Shipment of Radioactive Materials |
| 82-23 | 7/6-8/6/82 | Resident | Routine |
| 82-24 | 8/9-13/82 | Operations | Design Changes and Modifications, Non-licensed Training |
| 82-25 | 8/16-20/82 | Radiation Specialist | Environmental Monitoring |
| 82-26 | 8/9-9/3/82 | Resident | Routine |

* Inspection conducted to observe IAEA inspection activities.

TABLE 5 - ENFORCEMENT SUMMARY (7/1/81 - 8/31/82)

TROJAN NUCLEAR PLANT

| <u>Functional Area</u> | <u>Severity Level*</u> | | | | | | <u>Deviations</u> | <u>Totals</u> | |
|--------------------------------------|------------------------|-----------|------------|-----------|----------|-----------|-------------------|---------------|----|
| | <u>I</u> | <u>II</u> | <u>III</u> | <u>IV</u> | <u>V</u> | <u>VI</u> | | | |
| 1. Plant Operations | | | 2 | | | | | 2 | |
| 2. Radiological Controls | | | | | | | | 0 | |
| 3. Maintenance | | | | | 3 | | | 3 | |
| 4. Surveillance | | | | | | | | 0 | |
| 5. Fire Protection | | | | | 2 | | | 2 | |
| 6. Emergency Preparedness | | | | | | | | 0 | |
| 7. Security and Safeguards | | | | 1 | | | | 1 | |
| 8. Refueling | | | | | | | | 0 | |
| 9. Licensing Activities | | | | | | | | 0 | |
| 10. Design Changes and Modifications | | | | | 1 | | | 1 | |
| 11. Review and Audit | | | | 2 | 2 | | | 4 | |
| | <hr/> | | | | | | | | |
| | Totals** | 0 | 0 | 2 | 3 | 8 | 0 | 0 | 13 |

* Severity levels prior to March 1982 were in accordance with the NRC's Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), which provided six severity levels. Severity levels for March 1982 and later are in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C), 47 FR 9987 (March 9, 1982), which provides five severity levels. See Table 6 for further detail.

** Six of the 13 items resulted from Potential Enforcement Findings initially identified during the January - February 1981 Performance Appraisal inspection (see listing in Table 6).

TABLE 6 - ENFORCEMENT ITEMS (7/1/81 - 8/31/82)

| <u>Inspection Report No.</u> | <u>Subject</u> | <u>Severity* Level</u> | <u>Functional Area</u> |
|------------------------------|---|------------------------|------------------------|
| 81-26** | "Sub-tier" procedures not reviewed and approved as required by Technical Specifications | IV | 11 |
| 81-26** | Work procedures not reviewed by Plant QA Staff as required by QA Program | V | 3 |
| 81-26** | Reviews of machinery history not performed as required by QA Program | V | 3 |
| 81-26** | Safety-related review service provided by consultant not on the Approved Contractors and Suppliers List | IV | 11 |
| 81-30** | NRC enforcement findings and internal audit findings not reviewed by Plant Review Board | V | 11 |
| 81-34** | NRC enforcement findings not reviewed by Nuclear Operations Board | V | 11 |
| 82-01 | Failure to maintain security barrier | IV | 7 |
| 82-10 | Administrative Controls not provided regarding use of fire hoses for nonemergency purposes | V | 5 |
| 82-12 | Effective corrective actions not taken following discovery of inoperable diesel generator (civil penalty awarded) | III | 1 |
| 82-24 | Incorrect documentation (in as-built records) of completed design change | V | 10 |

Table 6 (Cont'd)

| <u>Inspection Report No.</u> | <u>Subject</u> | <u>Severity* Level</u> | <u>Functional Area</u> |
|----------------------------------|--|----------------------------|----------------------------|
| 82-24 | Maintenance procedures not updated to reflect plant design change | V | 3 |
| 82-24 | Use of fire hose for nonemergency purpose | V | 5 |
| 82-26 | Safety injection automatic actuation system blocked (reactor in modes 3 and 4) | III | 1 |

* Severity Levels for Inspection Report No. 82-01 and earlier are in accordance with the NRC's Interim Enforcement Policy, 45 FR 66754 (October 7, 1980), which provided six severity levels. Severity levels after Inspection Report No. 82-01 are in accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C), 47 FR 9987 (March 9, 1982), which provides five severity levels.

** This item resulted from a Potential Enforcement Finding initially identified during the January-February 1981 Performance Appraisal inspection.

TABLE 7 - SYNOPSIS OF LICENSEE EVENT REPORTS (7/1/81 - 8/31/82)

TROJAN NUCLEAR PLANT

| <u>Functional Area</u> | <u>SALP Cause Codes</u> | | | | | <u>Totals</u> |
|----------------------------|-------------------------|----------|----------|----------|----------|---------------|
| | <u>A</u> | <u>B</u> | <u>D</u> | <u>E</u> | <u>X</u> | |
| 1. Plant Operations | 7 | 5 | | 11 | | 23 |
| 2. Radiological Controls | | | | 1 | | 1 |
| 3. Maintenance | 2 | | | 1 | | 3 |
| 4. Surveillance | 3 | | 1 | | | 4 |
| 5. Fire Protection | | | | | | 0 |
| 6. Emergency Preparedness | | | | | | 0 |
| 7. Security and Safeguards | | | | | | 0 |
| 8. Refueling | 1 | | | | | 1 |
| 9. Licensing Activities | 1 | | | | | 1 |
| 10. Design/Modifications | | 1 | | | | 1 |
| 11. Review and Audit | | | 1 | | | 1 |
| | - | - | - | - | - | - |
| Totals | 14 | 6 | 2 | 13 | 0 | 35 |

Cause Codes:

- A - Personnel Error
- B - Design, Manufacturing, or Installation Error
- D - Defective Procedure
- E - Component Failure
- X - Other

TABLE 8 - LICENSEE EVENT REPORTS (7/1/81 - 8/31/82)

TROJAN NUCLEAR PLANT

| <u>LER No.*</u> | <u>Summary Description</u> | <u>Functional Area</u> | <u>Cause Code**</u> | |
|-----------------|---|------------------------|---------------------|-------------|
| | | | <u>LER</u> | <u>SALP</u> |
| 81-13/03 | Excessive Reactor Coolant System (RCS) leakage observed during RCS integrity test | 4 | D | D |
| 81-14/03 | Manual containment isolation valve for demineralized water washdown system found in open position | 1 | A | A |
| 81-15/03 | "B" steam generator blowdown containment isolation valve failed to close | 1 | E | E |
| 81-16/03 | "B" train hydrogen recombiner inoperable | 1 | A | A |
| 81-17/03 | Boron concentration in "C" safety injection accumulator not determined within six hours after water addition | 1 | A | A |
| 81-18/03 | Turbine first stage pressure trip setpoint found to have exceeded its limit | 1 | E | E |
| 81-19/03 | Control room train "B" emergency ventilation humidistat preheat coil would not energize | 1 | E | E |
| 81-20/03 | Control room "B" chlorine detector inoperable | 1 | E | E |
| 81-21/03 | Inadequate ventilation for "A" train preferred instrument and control power buses (due to installation of fire barrier) | 10 | A | B |

Table 8 (Cont'd)

| <u>LER No.*</u> | <u>Summary Description</u> | <u>Functional Area</u> | <u>Cause Code**</u> | |
|-----------------|---|------------------------|---------------------|-------------|
| | | | <u>LER</u> | <u>SALP</u> |
| 81-22/03 | Control room emergency ventilation Train "A" inoperable (damper failed closed) | 1 | E | E |
| 81-23/03 | Containment atmosphere sample return valve exceeded allowed closure time | 1 | E | E |
| 81-24/03 | "A" train emergency diesel generator inoperable (blown fuse in control circuit) | 1 | E | B |
| 81-25/03 | Power to preferred instrument bus Y11 lost for one minute (relay failure) | 1 | E | E |
| 81-26/03 | Both centrifugal charging pumps operated with less than required minimum flow | 1 | D | A |
| 81-27/03 | One diesel generator taken out of service, maintenance performed on the other | 3 | A | A |
| 81-28/03 | "B" train safety injection pump room cooling fan failed to start | 1 | E | E |
| 81-29/03 | Containment hydrogen vent system supply valves not limited to 50 degrees travel as committed to NRC | 1 | B | A |
| 81-30/03 | Containment pressure indicators reading absolute pressure vice differential pressure as required | 1 | A | B |
| 81-31/03 | Containment recirculation pump train "B" suction valve failed to reopen during test | 1 | E | E |
| 81-32/03 | Auxiliary feedwater diesel day tank level not verified as required by technical specifications | 11 | D | D |

Table 8 (Cont'd)

| <u>LER No.*</u> | <u>Summary Description</u> | <u>Functional Area</u> | <u>Cause Code**</u> | |
|-----------------|--|------------------------|---------------------|-------------|
| | | | <u>LER</u> | <u>SALP</u> |
| 82-01/01 | Extended inoperability of No. 2 diesel generator on three occasions; inoperability of both diesel generators on one occasion | 1 | X | A |
| 82-02/03# | Both source range nuclear instrumentation channels failed to energize following manual reactor trip | 1 | E | B |
| 82-03/03 | Failure of pump for process radiation monitor (PRM-1) | 2 | E | E |
| 82-04/03 | "B" train containment spray pump and centrifugal charging pump control switches left in "pull to lock" position following surveillance testing | 4 | A | A |
| 82-05/03 | Monthly surveillance on power-operated valves in component cooling water system not performed for four months | 4 | A | A |
| 82-06/01# | Abnormal degradation of fuel clad (baffle jet impingement) | 1 | E | B |
| 82-07/01 | Nonconservative containment spray modeling error in computer model used to evaluate containment response following a loss-of-coolant accident | 9 | X | A |
| 82-08/03 | One of four 125-VDC battery chargers failed to pass annual performance test | 1 | E | E |
| 82-09/03 | Partial collapse of chemical and volume control system holdup tank | 1 | D | B |
| 82-10/03 | Spent fuel pool level pumped down to less than the minimum level allowed by the Technical Specifications | 8 | A | A |

Table 8 (Cont'd)

| <u>LER No.*</u> | <u>Summary Description</u> | <u>Functional Area</u> | <u>Cause Code**</u> | |
|-----------------|---|------------------------|---------------------|-------------|
| | | | <u>LER</u> | <u>SALP</u> |
| 82-11/03 | Discovery of safety injection nozzle thermal sleeves in reactor vessel beneath lower core plate | 1 | E | E |
| 82-12/03 | Snubber found disconnected on reactor coolant loop drain line | 3 | A | A |
| 82-13/03# | Excessive seat leakage through four containment isolation valves | 3 | E | E |
| 82-14/03# | "B" train residual heat removal pump control switch left in "pull-to-lock" position following inservice testing | 4 | A | A |
| 82-15/01 | Both trains of safety injection system automatic actuation logic blocked (reactor in modes 3 and 4) | 1 | A | A |

* LERs ending with /01 required prompt notification with a 14-day followup written report. LERs ending with /03 required 30-day written report only.

** Cause codes:

- A - Personnel Error
- B - Design, Manufacturing, or Installation Error
- D - Defective Procedures
- E - Component Failure
- X - Other

Causally linked event. A causally linked event is one having the same root cause as an event which occurred earlier.