

Docket No. 50-344

MEMORANDUM FOR: P. H. Johnson, RV
M. H. Malmros, RV
M. Cillis, RV
C. Schwan, RV
R. F. Fish, RV
W. J. Wagner, RV
C. M. Trammell, NRR
R. T. Dodds, RV
G. B. Zwetzig, RV

FROM: D. M. Sternberg, Chief, Reactor Projects Branch No. 1, RV

SUBJECT: SALP BOARD REVIEW OF TROJAN

Reference: Memorandum to Same Addresses from Sternberg, Same Subject, dated September 8, 1982.

Members of the Trojan SALP Board are herewith provided a SALP data package to be used in preparing performance analyses of the various functional areas. This package includes selected portions of NRC Manual Chapter 0516; a summary of licensee activities; and summaries of inspection, enforcement, LER, and other pertinent data related to the SALP period (July 1, 1981 through August 31, 1982).

Based upon review of the enclosed material, the results of inspections performed, and your observations of licensee performance during the above interval, you are requested to prepare a performance analysis for each assigned area, following the format of enclosed NRC Appendix 0516, Part VI, Section IV. Note that each performance analysis should have three subsections: (1) Functional Area Analysis, (2) Conclusion, and (3) Board Recommendations (regarding NRC actions, if appropriate). It is anticipated that the performance analysis for each section should be one-half to one page (in final typed form). Responsibilities for preparation of the draft performance analyses are assigned as follows:

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PDR ADDCK 05000344
G PDR

TEO1

OFFICE	RV						
SURNAME	P. Johnson:dh	D. Sternberg					
DATE	9/24/82	9/ /82					

<u>Functional Area</u>	<u>Responsible</u>
1. Plant Operations	Malmros
2. Radiological Controls	Cillis
3. Maintenance	Malmros
4. Surveillance	Malmros
5. Fire Protection	Johnson
6. Emergency Preparedness	Fish
7. Security and Safeguards	Schwan
8. Refueling	Malmros
9. Licensing Activities	Trammell
10. Design Changes and Modifications	Johnson
11. Review and Audit	Johnson

The responsible individuals listed above should consult with predecessors and others involved in inspection of the functional area during the SALP period. Each draft performance analysis should be provided to Phil Johnson no later than October 8, 1982 so that a compiled draft can be provided to the SALP Board. The Board will convene in the Region V conference room at 8:30 a.m. on October 19, 1982.

By copy of this memorandum, the Director of the Office of Investigations, San Francisco Field Office, is also requested to provide (by October 8, 1982) a summary of major investigative activities conducted during the SALP period and their results.

D. M. Sternberg, Chief
Reactor Projects Branch No. 1

Enclosures:

1. Excerpts from NRC Manual Chapter 0516 (and Appendix 0516)
2. Trojan Nuclear Plant Activities
3. Summary of Inspection Activities
4. Listing of Inspections Conducted
5. Enforcement Summary
6. Listing of Enforcement Items
7. Synopsis of LERs
8. Listing of LERs
9. Summary of Other related Data

cc: (w/o enclosures):

J. Davis, NMSS
C. Michelson, AEOD
F. Wenslawski, RV
D. Schuster, RV
R. A. Clark, DOL, NRR
J. L. Crews, RV
O. C. Shackleton, Jr., OISFFO

bcc: DMB/DOCUMENT CONTROL DESK (RIDS)

Distributed by RV:

RHE (w/o enc)
State of Oregon
Resident Inspector

DESIGNATED ORIGINAL

Certified By D. Noack

Enclosure 2

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TROJAN NUCLEAR PLANT ACTIVITIES

July 1, 1981 through August 31, 1982

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, power reductions, and safety injection actuations are attached.

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.

DESIGNATED ORIGINAL

Certified By D. Noack

REACTOR TRIPSJuly 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.

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.

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 - 176		
Transportation - 28		
Effluent Control and Monitoring - 60		
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.

INSPECTIONS CONDUCTED (7/1/82 - 8/31/82)TROJAN NUCLEAR PLANT

<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	Modifcations
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
82-01	1/25-29/82	Safeguards	Physical Security

<u>Report No.</u>	<u>Dates</u>	<u>Inspector(s)</u>	<u>Areas Inspection</u>
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
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

<u>Report No.</u>	<u>Dates</u>	<u>Inspector(s)</u>	<u>Areas Inspection</u>
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

ENFORCEMENT SUMMARY (7/1/82 - 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
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.

** Six of the 12 items resulted from Potential Enforcement Findings initially identified during the January - February, 1981 Performance Appraisal inspection (see listing in Enclosure 6).

ENFORCEMENT ITEMS (7/1/82 - 8/31/82)TROJAN NUCLEAR PLANT

<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

* 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.

<u>Inspection Report No.</u>	<u>Subject</u>	<u>Severity* Level</u>	<u>Functional Area</u>
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
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

SYNOPSIS OF LICENSEE EVENT REPORTS (7/1/81 - 8/31/82)TROJAN NUCLEAR PLANT

<u>Functiona 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	3			1		4
4. Surveillance	2		1			3
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

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

<u>ER 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

<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	3	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

<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.

SUMMARY OF OTHER RELATED DATA (7/1/81 - 8/31/82)

TROJAN NUCLEAR PLANT

- A. Part 21 Reports: None
- B. Investigations and Allegations: (to follow)
- C. Escalated Enforcement Actions
 - 1. Civil Penalties:
June 2, 1982 - Ineffective corrective actions and resulting diesel generator inoperability (Inspection Report No. 50-344/82-12)
 - 2. Orders: None
 - 3. Confirmation of Action Letters:
June 18, 1982 - Resolve problem regarding degraded thermal sleeve components (in Reactor Coolant System) prior to startup.
- D. 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 C.1 above)
- E. Other
(Narrative regarding any significant strengths, weaknesses, or issues, at the discretion of the SALP Board).