

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No.: 50-312/85-04
Docket No.: 50-312 License No. DPR-54
Licensee: Sacramento Municipal Utility District
P. O. Box 15830
Sacramento, California 95813

Facility Name: Rancho Seco Unit 1

Inspection at: Herald, California (Rancho Seco Site)

Inspection conducted: January 26 - March 13, 1985 and April 12-30, 1985

Inspectors:

J. H. Eckhardt
J. H. Eckhardt, Senior Resident Inspector

5-17-85
Date Signed

G. P. Perez
G. P. Perez, Resident Inspector

5-16-85
Date Signed

Approved By:

L. F. Miller, Jr.
L. F. Miller, Jr., Chief
Reactor Projects, Section 2

5-16-85
Date Signed

Summary:

Inspection between January 26 - March 13, 1985 and April 12-30, 1985
(Report 50-312/85-04)

Areas Inspected: This routine inspection by the Resident and Regional Inspectors involved the areas of operational safety verification, emergency electrical system walkdown, maintenance, surveillance, follow-up on Licensee Event Reports, and independent inspection. This inspection involved 395 hours by two resident inspectors.

Results: Of the areas inspected, no violations or deviations were identified.

DETAILS

1. Person Contacted

a. Licensee Personnel

R. Rodriguez, Executive Director, Nuclear
*P. Oubre', Manager of Nuclear Operations
*G. Coward, Plant Superintendent
*B. Brock, Electrical I&C Maintenance Supervisor
*H. Canter, QA Engineer
R. Colombo, Regulatory Compliance Supervisor
*S. Crunk, Associate Nuclear Engineer, Regulatory Compliance
*R. Dieterich, Licensing Supervisor
*J. Field, Engineering and Quality Control Superintendent
*J. Jewett, QA Site Supervisor
J. Jurkovich, Site Resident Engineer
F. Kellie, Assistant Chemical and Radiation Superintendent
*R. Lawrence, Mechanical Maintenance Supervisor
V. Lewis, Supervising Civil Engineer
*R. Miller, Chemistry and Radiation Protection Superintendent
*R. Myers, Emergency Planning Supervisor
*S. Redeker, Shift Technical Advisor Supervisor
*L. Schwieger, Quality Assurance Director
T. Tucker, Planner/Scheduler

b. Contract Personnel

J. Shetler, B&W Outage Coordinator
*W. Speight, B&W, Regulatory Compliance

*Attended the Exit Meeting on March 13, 1985

2. Operational Safety Verification

The inspectors observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the inspection period. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the auxiliary and turbine buildings were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations.

During this inspection period the unit operated at or near 95 percent capacity load, with the following exceptions. On February 5, the unit was ramped down to 41 percent power and remained at this level for three days, for the first of two high pressure condenser tube leaks. The licensee identified and plugged one leaking tube and plugged fifteen others as a preventative measure. On February 25, power was reduced to 62 percent due to instability of feedwater pump control. The licensee replaced a control module in the integrated control system and increased power. This appeared to correct the instability problem. The second

high pressure condenser tube leak occurred on March 11. The power was reduced for one day to 60 percent and one leaking tube was plugged along with seven others as a preventative measure.

The plant was shutdown on March 15 for a refueling outage. The activities during the outage will be discussed in a subsequent inspection report.

3. Safety Feature System Walkdown, Emergency Diesel Generator A

During the course of this inspection period, the inspector conducted a walkdown of the "A" emergency diesel generator to examine valve and switch line-ups and system condition including general housekeeping of the diesel generator room. No deficiencies in the system line-ups were identified, however, the following housekeeping items were noted:

- ° debris in floor drains
- ° tie wraps on floor
- ° light bulbs adrift on various electrical junction boxes
- ° oil under lube oil bypass pump
- ° lube oil filters setting on pipe support
- ° electrical box covers lying on the floor
- ° electrical parts in a plastic bag on the floor

These items were reported to the licensee for evaluation. The quality assurance organization performed an additional surveillance of this area and corrective action was taken.

No violations or deviations were identified.

4. Maintenance

During this inspection, period the inspectors made tours of the new emergency diesel generator (Transamerica De Laval) buildings and laydown areas where the parts of the disassembled diesels were being inspected. Particular attention was given to cleanliness controls and parts identifications. Toward the end of the inspection period the diesels were reassembled and were being prepared for their 100 hour run tests. The inspector noted that the space heaters for the generator end of the machines were energized as required.

No violations or deviations were identified.

5. Surveillance

The inspector observed the performance of portions of the following surveillances:

- °SP200.08A "Monthly RPS Channel A Surveillance"
- °SP200.09 "Monthly Safety Features Actuation System Surveillance Test"
- °SP200.01 "Instrumentation Surveillance Performed Each Shift"

The inspector noted that the operator or technician performing the evaluation recorded the data, and the data was in agreement with the observations made by the inspector.

No violations or deviations were identified.

6. Licensee Event Report (LER) Follow-Up

- a. The following LER's were reviewed and closed. The inspector verified that reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and the LER forms were complete.

LER 83-40 Rev. 1 "Auxiliary Feedwater Flow Transmitters Not Properly Calibrated."

Revision 1 of LER 83-40 was issued to clarify the design error aspects of the auxiliary feedwater orifice plates and to clearly define the cause of the improper calibration. The LER contained corrective actions to be accomplished to prevent recurrence of this event. The licensee also intends to replace the orifice plates during the cycle 7 refueling outage. The inspector will continue to investigate the licensee's actions in conjunction with the investigations of the licensee's response to a Notice of Violation (84-15-01) concerning this item. Therefore, this LER is considered closed.

LER 84-21 "Failure of Surveillance Procedure to Satisfy Technical Specifications."

Technical Specification 4.8.2.2 requires the licensee to test the auxiliary feedwater pumps at least once per 18 months during a shutdowns, to verify that each pump will start "...automatically upon receipt of each auxiliary feedwater actuation test signal".

The licensee identified that the surveillance test did not directly verify that the pumps started on each automatic signal. The test did verify the pumps were operable, but used a series of overlapping tests that verified the system's operability. The licensee revised and successfully completed the surveillance test twenty three days after the situation was identified.

The inspector identified that one of the three automatic start signals, low main feedwater header pressure, was not being tested during the eighteen month shutdown surveillance. However, the licensee does use this signal on their monthly auxiliary feedwater pump surveillance test. Therefore, although the pumps are not being

started with the low main feedwater header pressure signal during shutdown, per the technical specifications, the licensee has shown operability of the start signal on a monthly basis. The inspector brought this situation to the licensee's attention, and the licensee has committed to evaluate the present technical specification and submit appropriate changes that reflect the actual surveillance testing program.

This is an open item pending review of the licensee's action including the main feedwater header pressure start testing. (50-312/85-04-01) The LER is considered closed.

b. LER 85-04 "Fire Dampers Not Installed"

On March 8, 1985, the licensee submitted an LER concerning fourteen fire dampers that were not installed in the auxiliary building. The fire dampers were required by Amendment 19 (dated February 28, 1978) to the Operating License. This amendment specified that the licensee perform certain fire protection modifications, part of which were the installation of fire dampers in specific locations. The required implementation date for the fire dampers of concern was the end of the 1979 refueling outage. The licensee recently identified the missing fire dampers during an ongoing evaluation of their fire protection program.

Specifically, Facility Operating License No. DPR-54 was amended by adding paragraph 2.C.(4) to read as follows:

"The licensee may proceed with and is required to complete the modifications identified in Paragraph 3.1.1 through 3.3.40 of the NRC's Fire Protection Safety Evaluation (SE) on the facility dated February 28, 1978. These modifications shall be completed as specified in Table 3.1 of the SE....."

The paragraphs of the SE that required the fire dampers that were not installed are:

- ° Item 3.1.2 Instrument Shop - Install fire dampers in all ducts to fire area 14 - Turbine Deck Corridor.
- ° Item 3.1.5 Turbine Deck Corridor - Install fire dampers in all duct penetrations except the emergency control room ventilation ducts.
- ° Item 3.1.21 Electrical Penetration Area - Grade Level - Install fire dampers in ducts to fire area 36.
- ° Item 3.1.22 Main Corridor - Grade Level - Install a fire damper in duct to fire area 34.
- ° Item 3.1.30 Containment Penetration Valve Area East - Install fire dampers in ducts to fire area 46.

Table 3.1 of the SE specified the completion date of the above items as the end of the 1979 refueling outage.

The present fire protection evaluation was being performed by the licensee to comply with 10CFR50 Appendix R requirements. This ongoing evaluation apparently determined that six of the fourteen originally required dampers should no longer be required due to new fire area boundaries. However, the eight missing dampers are still appropriate.

The basic cause of the missing fire dampers is considered to be the failure to properly transfer the basic fire damper requirements specified in the SE to an engineering document to ensure installation. Since the licensee identified this problem and took appropriate temporary corrective action (established a firewatch), no violation will be issued.

c. LER 85-01 "Loss of Containment Integrity via Open Valves"

On February 25, 1985, the licensee submitted an LER concerning four hydrogen monitor system containment isolation valves which were apparently open for a seven day period during plant operation from January 9 to January 16, 1985. The valves connect one inch diameter lines which form a closed loop back into the containment. The hydrogen monitoring system consists of supply and return lines penetrating the containment through larger pre-existing penetrations. Each of the one inch supply and return lines has two valves in parallel inside of the containment and two valves in parallel outside of the containment which function as containment isolation valves for this system. These valves have the following valve numbers:

	<u>Inside Containment</u>	<u>Outside Containment</u>
Supply line	HV-70041 HV-70042	HV-70045 HV-70046
Return line	HV-70040 HV-70047	HV-70043 HV-70044

These valves are solenoid operated valves and are remote manually operated from the hydrogen monitor control panels in the auxiliary building-grade level (panels H4PBA and H4PBB) by open and close push buttons. The valves cannot be operated from the control room. The valves are not automatic valves, that is, they do not actuate due to a system signal; they are not part of the engineered safety features actuation system (ESFAS).

The Technical Specification, Section 1.7, defines containment integrity as follows:

"Containment integrity exists when the following conditions are satisfied:

- A. The equipment hatch is closed and sealed and both doors of the personnel hatch and emergency hatch are closed and sealed except as in B below.
- B. At least one door on each of the personnel hatch and emergency hatch is closed and sealed during refueling operations or personnel passage through these hatches.
- C. All non-automatic containment isolation valves and blind flanges are closed as required.
- D. All automatic containment isolation valves are operable or closed in the safety features position.
- E. The containment leakage satisfies Specification 4.4.1 and no known changes have occurred.

In addition, the Technical Specification Section 3.6.1, requires that:

"Containment integrity shall be maintained whenever all three of the following conditions exist:

- A. Reactor coolant pressure is 300 psig or greater.
- B. Reactor coolant temperature is 200 F or greater.
- C. Nuclear Fuel is in the core."

Based on these Technical Specifications these remote manually (non-automatic) operated containment isolation valves are required to be closed during plant operation. This does not imply that the valves cannot be temporarily opened for a necessary plant evolution or required test, provided that they are returned to the closed position after completion of the evolution or test.

On January 16, 1985, an Auxiliary Operator (A)) discovered valves HV-70041, 70042, 70045, and 70046 (the hydrogen monitor system supply line valves) indicating in the open position as evidenced by their respective open push buttons being lighted. The control room operators' immediate action was to order the valves to be closed. The plant had been greater than 300 psi pressure and 200°F temperature since January 6, 1985 at which time containment integrity was required per Technical Specification Section 3.6.1.

The inspectors evaluated this event, and determined that Surveillance Procedure SP205.07, "Isolation Valve Surveillance Test" was performed on January 4, 1985 for valves HV-70045 and HV-70046. The purpose of this procedure was to stroke remotely operated containment isolation valves quarterly and ensure that specified stroke times are met. SP205.07 was performed to meet the requirements of Subsection IWV of Section XI, ASME B&PV Code, Summer, 1973, "Inservice Testing of Valves in Nuclear Power Plants". The SP required that the valves of concern be stroked to their

closed position, and the stroke time measured. Step 4.1.5 of the procedure specified to return the valves to its "as found" position if the resulting position was different than the "as found" position. The inspectors could not determine how or when the valves were opened. The operators who performed the SP on these valves indicated that the valves were left in the closed position at the completion of the SP.

This system was installed during the 1983 refueling outage to meet the requirements of NUREG 0737 item II.F.1. The licensee implemented this modification via Engineering Change Notice (ECN) A-2938. Revision 4 to this ECN, dated March 9, 1984, was the current revision. The Design Basis Report for this ECN, dated July 24, 1984, specified the design criteria. Criteria II.B.4 required that ... "Solenoid valve position (containment isolation) and containment hydrogen concentration shall be indicated on the plant computer. Solenoid valve position shall also be indicated on the control panels". (Here, the "plant computer" refers to control room indication and the "control panels" refers to the hydrogen monitor control panels in the auxiliary building (panels H4PBA and H4PBB)). Criteria II.B.5 required that "Since the hydrogen sample line containment isolation valves do not receive a safety signal initiation, these valves shall be administratively locked closed". These two design features, indication of valve position in the control room, and the valves being administratively locked closed, did not exist in the system during the period of the event. The relevant portion of the ECN was closed. The portion of the ECN that remained open did not address the design requirements of control room valve position indication, or administratively locking shut the valves. It appeared that these design requirements of control room valve position indication and administratively locking shut the valves requirements were not transferred from the Design Basis Report to the ECN Subsections that detailed the modification. It is considered that two of the principal contributors to this event were the lack of control room valve position indication for these valves and fact that they were not locked closed. AP214.03, "Locked Valve List, section 3.3, 3.4, and 3.5 specify

- "3 "Locked" means a valve which has a wire with lead seal, attached in such a manner that the wire captures the valve handle/actuator, valve body or other fixed structure, and the valve position and identification tag. When metal tags are not available., Caution or Danger Tags may be used. If it is necessary to use Caution or Danger Tags, the valve must still be "locked" with a wire and lead seal.
- .4 If the seal must be broken to position the valve, permission must be obtained from either the Shift Supervisor or Senior Control Room Operator prior to breaking the seal. The valve position/identification tag will be brought to the Control Room where it will be hung on the secure key locker. The abnormal positioning of the valve will be logged in the Control Room and Shift Supervisor's log giving the reason why it is in an abnormal position. The lock wire and lead seal will be

disposed of. When the shift is relieved, the new Shift Supervisor, Senior Control Operator and Control Operator will review those valves which are in an abnormal position to ensure they are aware of any time limits imposed.

- .5 When the valve can be repositioned in its normal position, the valve will be wired with the position/identification tag as explained above. This fact will be logged in the Shift Supervisor and Control Room log."

If the control room valve position indication had been available or if the valves were locked closed as defined above, the probability of the event would have been greatly reduced. The underlying weakness in the licensee's design control system appears to have occurred in the transfer of design requirements to the detailed engineering documents. There was apparently no ECN Subsection generated to ensure that the control room valve position indication design criteria or valve locking design criteria was implemented.

Since the licensee identified this problem and has taken action to lock the valves shut (with a plastic cover lock wired over the push buttons), no violation will be issued. In addition, the licensee has committed to develop and implement a review program to evaluate past design changes and commitments to ensure implementation. This is an open item (50-312/85-04-02).

Furthermore, the inspector's evaluation of this event revealed three additional anomalies that should be addressed by the licensee.

- 1) The LER stated that the system outside of containment beyond the isolation valve of concern is not Class 1. However, based on the following drawings, it appears that the hydrogen monitor system is, in fact, Class 1, Seismic Category 1.
 - ° Bechtel Drawing M-551, Rev. 18, P & I Diagram, Reactor Building HVAC system.
 - ° SMUD Drawing Change Notice M-551, Rev. 15, Sheet 2 of 2, Hydrogen Monitor System.
 - ° Bechtel Drawing M-575, Rev. 2, P & I Diagram, Post Accident Sampling System (PASS).

These drawings specify the hydrogen monitor system as Class 1, Seismic Category 1 up to and including the first isolation valve (HV-53605) of the PASS supply line and up to and including the PASS return line check valve (RSS-082). These valves are normally closed. The PASS is specified on the drawings as Class 2, Seismic Category 2. One exception to the Class 1, Seismic Category 1 classification of the hydrogen monitor system is the piping for radiation monitor R15044 which is specified as Class 2, Seismic Category 2. This radiation monitor is isolated from the hydrogen monitor system by Class 1, Seismic Category 1 isolation valves (HVS-705 and HVS-704),

which shut automatically at 15 psig system pressure to protect the radiation monitor pump.

The inspectors consider that the LER should be modified to reflect the actual system classification. Open item (50-312/85-04-03).

- 2) Surveillance Procedure SP 205.07, Isolation Valve Surveillance Test, Limit and Precaution 3.5 required "Dates of all successful valve stroking per SP 205.7 shall be entered in SP 205.09, Containment Isolation Valve List." However, the inspectors were unable to locate the referenced SP 205.09., and determined from the Table of Contents of the Surveillance Procedure Manual that SP 205.09 was deleted August 25, 1981. It is considered that the licensee should have identified this anomaly either when SP 205.09 was deleted in 1981, or at least during performance of the quarterly stroke tests since 1981.

The inspectors consider that this procedural error should be corrected. Open item (50-312/85-04-04).

- 3) The inspectors reviewed the maintenance records of the hydrogen monitor system isolation valves from September, 1984 through January, 1985. The records indicated several failures of these valves during this five month period as summarized below.

<u>Date</u>	<u>Work Request</u>	<u>Summary</u>
September 24, 1984	90976	HV-70044 would not close. Indicating light was jammed in its receptacle, restricting the action of the push button. Re-centered indicating light.
September 26, 1984	91053	HV-70045 open or closed back light not lighted. Found fuse DSF1-1 pulled out. Replaced fuse and fuse immediately blew. Disconnected wires, cleaned sockets, replaced relays. Reassembled with new fuse.
October 15, 1984	91733	HV-70045 open or closed back lights not lighted. Found fuse DSF1-4 blown. Replaced fuse.
December 5, 1984	94009	HV-70045 would not indicate that it would stroke in either direction. Replaced solenoid and switch.

December 25, 1984 94010

HV-70046 would not stroke open. Contacts in closed switch were defective. Replaced switch.

Although the licensee did not trend the maintenance history of these valves during this period, they indicated that they are aware of the poor history of these solenoid operated valves and are considering replacing them during a future outage. The licensee is also developing a more formal equipment trending program in response to a previous followup item (50-312/84-19-05).

7. Followup of Previous Inspection Items
(Closed) Inspection Report (50-312/83-07) Licensee Commitment to Revise
Licensed Operator Retraining Procedure (83-07-01).

The licensee had committed to a major revision of AP.25, "Licensed Operator Retraining", to agree with the requirements of Topical Report T2-80. The licensee has since deleted procedure AP.25. Nevertheless, the licensee is still committed to Topical Report T2-80 and the retraining program has been recently inspected by a regional based inspector as discussed in Inspection Report 50-312/84-29. The licensee appears to be implementing the retraining program in accordance with T2-80. Therefore, this item is closed.

8. Response to a Regenerative Holdup Tank Leak

On March 7, 1985, a leak occurred in the B Regenerative Holdup Tank (RHVT). The tank developed a 1 inch diameter hole approximately 2 feet above the ground level. The leak occurred at approximately 3:00 p.m., and was immediately noticed by licensee personnel who took immediate action to contain and stop the leak. The leak was temporarily stopped with a wooden plug. The water contained small quantities of tritium and had a pH of approximately 12.5. The inspectors observed good health physics by licensee personnel practices during this event. After draining the tank, a small defect was found in the tank liner which is considered by the licensee to be the cause of the leak.

No violations or deviations were identified.

9. Housekeeping

The inspectors observed that, to improve housekeeping at Rancho Seco, a Quality Circle composed of all members of the Rancho Seco Safety Committee recommended a strict smoking policy. An extensive policy was developed, issued, and became effective March 11, 1985; it restricted smoking to very specific areas. The policy has clear requirements for proper disposal of cigarette butts, and includes strong disciplinary action for individuals not adhering to the rules. The inspectors consider this is one important and effective step to improve the cleanliness and housekeeping of Rancho Seco.

10. Video Tape Concerning Quality

The President of the SMUD Board of Directors and the SMUD General Manager have recently produced a video tape concerning safety and quality at Rancho Seco. This tape has been presented to all Rancho Seco personnel, and will be shown to all new employees as part of the new employee orientation training. The inspectors consider that this presentation is an excellent tool to further establish a quality climate at Rancho Seco.

11. Root Cause Analysis

The licensee is in the process of developing a root cause evaluation program for the purpose of analyzing events. At present, they have written a draft administrative procedure that describes the responsibilities for identifying incidents that require an investigation of root cause, and provide a mechanism for that review. They plan to use this procedure for plant trips, personnel safety incidents, NRC violations, LERs and other significant incidents. The program is currently being used on a trial basis for recent events.

The inspectors have discussed with licensee management the concept of a formal critique subsequent to an event to gather facts in a timely manner from the persons involved in an event. The licensee has agreed to consider this concept, and ascertain whether it will be implemented. However, they want to first evaluate their present program prior to making any changes or additions.

This is considered a followup item pending the licensee's implementation of the program and the consideration of the critique concept.
(50-312/85-04-05).

12. LRS Implementation Status

On March 12, 1985, the Region V Administrator, Division Directors, and Rancho Seco Senior Resident Inspector met with the SMUD Board of Directors Subcommittee responsible for implementing the LRS recommendations. The subcommittee presented the status of the recommendations, making the following points.

- ° Approximately 90 percent of the 122 items have been prioritized with responsible individual and proposed completion date indicated.
- ° Fourteen items have been completed.
- ° The Quality Assurance department has been reorganized.
- ° The Supervisor of Licensing now reports directly to the Executive Director, Nuclear instead of to the Nuclear Engineering Manager.
- ° Other major personnel and organization changes will not occur until after the refueling outage.

Additional meetings will be held for an update of progress.

The licensee has generated a status list of each recommendation and supplied the Resident Inspectors with weekly updates of the list. The Resident Inspectors periodically discuss the proposed changes with key Rancho Seco personnel to determine the effect of the proposed changes.

13. Non-Licensed Training

The inspector verified through questioning that training and retraining activities appear to be in conformance with the licensee's Technical Specifications. Training is being given to employees on administrative controls, major procedure revisions, radiological health and safety, controlled access, security procedures, and quality assurance.

No violations or deviation were identified.

14. Exit Meeting

The resident inspectors met with licensee representatives (denoted in Paragraph 1) at various times during the reporting period, and formally on March 13, and May 3 1985. The scope and findings of the inspection activities were summarized at the meeting. Licensee representatives acknowledged the inspectors' findings.