

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-312/85-32

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: November 17, December 17, 1985

Inspectors:

Glen P. Perez, Resident Inspector

1-29-86 *fm*
Date Signed

William G. Albert, Reactor Inspector

1-29-86 *fm*
Date Signed

James H. Eckhardt, Senior Resident Inspector

1-29-86 *fm*
Date Signed

Lewis F. Miller Jr., Section Chief

1-29-86 *fm*
Date Signed

Summary:

Inspection between November 1 and December 17, 1985 (Report 50-312/85-32)

Areas Inspected: This routine inspection by the Resident Inspectors involved the areas of operational safety verification, maintenance, reactor startup, essential safety feature system walkdown, and surveillance. Also a special enhanced Control Room and plant operation inspection was performed. During this inspection, Inspection Procedures 30703, 61726, 62703, 71707, 92700, 71710, 71715, 72700, 92702, 92704 and 93702 were used. This inspection involved 752 hours including 244 hours on backshift onsite.

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

8602180423 860131
PDR ADOCK 05000312
Q PDR

DETAILS

1. Persons Contacted

a. Licensee Personnel

G. Coward, Manager, Nuclear Plant
J. McColligan, Assistant Manager, Nuclear Plant
*S. Redeker, Nuclear Operations Manager
J. Shetler, Nuclear Scheduling Manager
B. Spencer, Nuclear Operations Superintendent
*R. Lawrence, Nuclear Mechanical Maintenance Superintendent
N. Brock, Nuclear I&C Maintenance Superintendent
R. Colombo, Regulatory Compliance Superintendent
*J. Field, Nuclear Technical Support Superintendent
*S. Crunk, Incident Analysis Group Supervisor
J. Jurkovich, Site Resident Engineer
F. Kallie, Acting Chemical and Radiation Supervisor
L. Schwieger, Quality Assurance Manager
M. Hieronimos, Assistant to the Operations Superintendent
D. Comstock, Assistant to the Operations Superintendent
J. Delrue, Shift Technical Advisor
*Q. Coleman, QA Construction Supervisor
*J. Jewett, Site QA Supervisor
*H. Canter, QA Surveillance Supervisor

Other licensee employees contacted included technicians, operators, mechanics, security and office personnel.

b. NRC Inspectors participating in the Enhanced Inspection Effort:

G. Zwetzig	D. Willet
W. Albert	A. Chaffee
R. Pate	P. Norbut
G. Johnston	L. Miller
P. Qualls	J. Burdoin
C. Myers	A. D'Angelo
M. Padovan	T. Polich
K. Ivey	D. Pereira
C. Sorensen	P. Morrill
W. Alig	C. Bosted
J. O'Brien	G. Kellund
T. Young	M. Cillis

*Attended the Exit Meeting on December 17, 1985.

2. Operational Safety Verification

During this report period the plant reached criticality on November 2, 1985, and went on line on November 3, 1985. The plant was brought to 40% power on November 3 and remained around 40% until November 7, when the licensee took the main generator off line, at 15% power, to perform the

required overspeed trip test of the main turbine. The plant went back on line on November 8, and operated at 40% full power until November 17, when power was increased to 75% full power. At the 40% power level, the licensee made repairs to leaks on both of the main feedwater pumps' mini-flow recirculation lines to the main condenser, and conducted special tuning procedures on the integrated control system. The plant escalated power to about 92% on November 20, and maintained this power level to troubleshoot control problems with the "2A and 2B" feedwater heater controllers. On December 5, the reactor experienced a trip due to high reactor coolant pressure. Details are discussed in paragraph 9. The licensee completed a detailed post trip review, then brought the reactor critical on December 12. The plant reached 100% full power on December 16 and maintained this power level through the rest of the report period.

The inspectors observed control room operations, verified proper control room staffing, reviewed applicable logs, conducted discussions with the operations crews, reviewed selected emergency systems, reviewed tag-out records, verified proper removal from service of affected components, and verified the licensee's adherence to limiting conditions for operations. Tours of the auxiliary building, turbine building, and the general site area were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, lubrication levels and excessive vibrations, and to verify that maintenance requests had been initiated for equipment in need of maintenance.

The inspectors reviewed portions of non-licensed operator logs, conducted various discussions with the non-licensed operators, and observed them performing their assigned duties.

During tours of the facility, the inspectors frequently entered radiologically controlled areas. The inspectors verified compliance with the licensee's radiation protection program. The inspectors discussed the radiation work permit requirements and the radiological conditions of the work areas with workers in the radiologically controlled areas. Also, the inspector verified proper clothing requirements and observed the method of personal frisking when exiting radiological controlled areas. The inspectors randomly examined selected radiation protection instruments to verify operability and adherence to calibration frequency.

The physical security plan was evaluated on a daily basis during this period by observing security performance during the inspector's daily entry through the monitoring area, wearing of photo identification badges by personnel, escorting of visitors and security compensatory measures when security doors were out of service.

The licensee took adequate corrective action to eliminate minor deficiencies the inspectors identified during this inspection period.

No violations or deviations were identified.

3. Monthly Surveillance Observation

The Technical Specification (TS) required surveillance tests listed below were observed and reviewed to ascertain that they were conducted in accordance with these requirements.

The following items were considered during this review: testing was in accordance with adequate procedures; test instrumentation was calibrated; limiting conditions for operation were met; removal and restoration of the affected components were accomplished; test results conformed with TS and were reviewed by personnel other than the individual directing the test; the reactor operator, technician or engineer performing the test recorded the data, and it was in agreement with observations made by the inspector, and any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The following surveillance tests were observed/reviewed:

- . SP 210.05 "Turbine Mechanical Overspeed Trip Surveillance Test"
- . SP 200.15 "Turbine EHC Overspeed Trip Surveillance"
- . SP 200.01 "Instrumentation Surveillance Performed Each Shift"
- . I-108 "RPS Channel Test" (various channels)
- . SP 210.01B "Monthly Motor Driven Auxiliary Feed Pump P-319 Surveillance and Inservice Test"
- . SP 206.03B "Diesel Generator 6-886B Synchronization Surveillance Test"
- . SP 205.07D "Isolation Valve Surveillance Test"
- . SP 203.07 "NSRW and NSCW Systems Quarterly Surveillance and Inservice Inspection Test"
- . SP 200.04 "Incore Instrumentation Surveillance"
- . SP 207.04B "Weekly RCS Leakage Rate"
- . SP 200.02 "Instrumentation Surveillance Performed Each Day"

The licensee was not able to complete the physics testing program prior to the end of this report period. Although certain portions of the testing were observed by the inspectors, completion of the physics testing inspection program will be documented in a future report.

No violations or deviations were identified.

4. Monthly Maintenance Observations

Station maintenance activities of safety-related and non-safety-related systems and components listed below were observed and reviewed to ascertain that they were conducted in accordance with approved

procedures, regulatory guides, and industry codes or standards, and were in conformance with technical specifications.

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; activities were accomplished by qualified personnel; radiological controls were implemented; and, fire prevention controls were implemented.

The following maintenance activities were observed and/or reviewed:

- . Repairs on the "A" and "B" mini-flow recirculation line on the main feedwater pumps,
- . Repair of the discharge line of the "B" main feedwater pump high point vent valve,
- . Repacking of the auxiliary feedwater pump,
- . Integrated Control System tuning at various power levels,
- . Steam leak repairs of various secondary valves,
- . Repairs and troubleshooting of the "2A" and "2B" heater drain systems,
- . Relief valve testing of various heater relief valves.

No violations or deviations were identified.

5. Licensee Action on Previous Inspection Findings

(Closed) Violation 83-36-02 - Failure to follow a temporary change to a procedure. The licensee appeared to have taken the appropriate corrective action. The licensee has been emphasizing the importance to follow written approved procedures. The inspector reviewed the temporary change procedure and found it to be adequate to control a temporary change to a procedure, if followed. The inspector had no further questions. This item is closed.

(Closed) Violation 83-36-03 - Operated with pressurizer level instruments not within their performance requirement. The licensee's corrective actions included: Increased training in technical specifications for the site engineers, who review surveillances; revision of technical specifications (TS) require surveillance so that the procedure clearly identifies the TS requirements; development of a stamped work request which clearly identifies work which involves a limiting condition for operation (LCO), and review of the LCO work requests in the management morning meeting. These corrective actions appear appropriate to avoid further events of this type. The inspector had no further questions. This item is closed.

(Closed) Violation 84-13-01 - No documentation on MCC storage and space heater operation

This violation concerned records which were unavailable, relating to storage and protection of new motor control centers (MCC) received on site. The records missing were records to show that space heaters in these MCC's had been maintained in the energized condition.

In their response, the licensee stated that corrective action would be initiated by providing for written records of storage conditions and space heater energization. Procedure revisions on the "Review and Control of Material Requisitions" and another on "General Receiving Inspection of Material and Pre-Installation Storage" were examined and discussed with the licensee's quality assurance manager. The inspector questioned whether the procedures were sufficiently clear when it came to entering storage conditions on the original storage documents. The licensee explained that they had previously taken exception to the designated storage levels (A, B, C & D) of ANSI N45.2.2 and that this was the reason for the NRC inspectors observation. However, they would examine the forms and procedure wording further on this point. In any event the procedures did address the NRC's original concern regarding documentation and this item is closed.

(Closed) Violation 85-01-03 HVAC Hangers Not Installed in Accordance With Drawings and Accepted "As Is" Without Disposition of Discrepancies

During the inspection conducted on January 7-11, 1985, four safety related seismic supports for essential heating, ventilating and air conditioning ducts were found to not be installed in accordance with the approved plant drawings. These supports had been inspected and accepted by a quality control inspector.

In response to this citation the licensee stated that a 100% inspection of all visually accessible embed type NSEB HVAC system supports had been performed. The licensee determined that 12 other supports were deficient but found that all acceptances of deficient supports were the work of a single QC inspector, and that none represented significant safety problems. In addition to the HVAC supports, the licensee organized a multi-discipline task force to investigate other areas although they believed that the deficient HVAC supports in the NSEB were an isolated case. Training was also to be conducted as necessary for QC inspectors.

In a letter to the NRC on June 3, 1985 the licensee reported on the findings of the multi-discipline task force. This task force identified nine specific weaknesses in the licensee's programs for controlling modification work and listed the corrective actions to be taken.

The detailed report of the task force was examined as well as training records and procedure modifications resulting from the task force findings. The task force assignment was later extended to further address concerns which arose because of the failure of a 1 inch high point vent line on June 23, 1985. The NRC inspector concluded that the licensee had ultimately responded adequately to the concerns expressed in the subsequent notice of violation issued as a result of that event. All

pipng support concerns were addressed in enforcement action dated September 26, 1985.

As part of the close out action, a general tour of the NSEB was made. No further deviations or violations were found and this item is closed.

6. Enhanced Control Room and Plant Operation Observation Inspection

This inspection was conducted to intensely evaluate the licensee's performance during the start-up, physics power testing, and at various power levels. The inspection was carried out by senior members of the Region V staff, Project and Resident Inspectors assigned to operating power reactors in Region V, and the Senior Resident and Resident Inspectors assigned to the Rancho Seco Nuclear Power Plant site. The inspection consisted of the evaluation of the licensee's performance commencing on November 2, 1985 during plant heatup for criticality. The inspection consisted of around-the-clock coverage through November 4, 1985. From November 4, 1985 until November 7, 1985 the inspection consisted of day shift coverage. Then on November 8, 1985, continuous around-the-clock coverage began and continued through November 22, 1985 and then was modified to a sixteen hour coverage throughout the remaining report period.

Operating crew performance was assessed based upon the observation of (1) the conduct of scheduled plant evolutions during criticality and power physics tests, (2) crew response to unplanned events, and (3) thorough discussions with both licensed and non-licensed crew members. There were numerous occasions during the inspection when control room operators were asked about the reasons for actuated annunciators and other system and component status. On these occasions the operators demonstrated a good level of knowledge of plant instrumentation and equipment status. Other areas where the crews' performance as a whole was judged to be of good quality were: (1) training in the Control Room during plant manipulations, (2) watch-standing which appeared professional and attentive, and (3) auxiliary operators and equipment attendants' responses to questions about systems and status.

Shift turnover practices were observed frequently. In most cases, the shift turnover of plant and equipment status, particularly within the Control Room - including "walk down" of instrument and Control Room panels - was judged to be good. However, the inspectors were concerned with the large shift meeting, including the whole crew prior to relieving the earlier crew. This was held in the lunch room outside the Control Room. The lunch room appeared too small for the whole crew, and provided an informal atmosphere. The licensee management was informed of the concern, and stated that it was planned to provide a larger, more formal room for shift meetings.

As a whole the general condition of plant equipment and of housekeeping practices was considered good.

The licensee provided around-the-clock management coverage during the start-up, testing, and power manipulation phases. The inspectors interfaced with these managers frequently. The inspectors observed the

licensee managers to be involved with the activities affecting the plants operations. The managers exhibited a professional and positive attitude and provided meaningful coverage.

The inspectors discussed many observations with licensee management. These concerns were either addressed immediately by the licensee when possible, or a commitment to further investigate the concern was made. The following are a sample of items brought to the licensee's attention:

- (1) Numerous "nuisance alarms" were apparent in the Control Room, particularly alarms associated with entering and exiting the fire protection zones.
- (2) Unreliability of the IDADS system, apparently due to interface problems with the Bailey Computer,
- (3) The lack of a clear system to identify all equipment out of service to the operator, such as one log to record all clearances on "non-safety" related equipment,
- (4) Guidance for making 10CFR 50.72 phone call notifications was apparently lacking, and
- (5) In some instances, operators were unaware that fire watches should have been posted for inoperable fire doors.

The inspectors reviewed the licensee's corrective actions of the observation brought to management, and found the actions to be appropriate. The inspector had no further questions.

No violations or deviations were identified.

7. Safety Features System Walkdown

During this report period two safety features systems were verified for operability. These systems were the auxiliary feedwater system and the "A" diesel generator. The inspector reviewed the licensee's surveillance and system lineup procedures against the as-built configuration, examined the systems required auxiliaries for any degraded condition, inspected portions of the electrical instrumentation, verified proper calibration of instrumentation, and verified local and remote position indication of the system's value line-ups. No discrepancies were noted.

No violations or deviations were identified.

8. Followup on Licensee Event Report (LER) 85-22: Pressurizer Sample Line Isolation Valve Found Open

On November 20, 1985, the licensee discovered that the pressurizer sample line valve (HV-21516) was open, which was an incorrect position for this valve during normal plant operation. By procedure, when this valve is not being used for a pressurizer liquid sample, the valve should be closed with its power supply breaker racked out. The inspectors

determined the following about the incident: The last time the breaker was racked in and the valve opened was in preparation for a pressurizer sample on November 19, 1985 at 1510 hrs. This was performed by procedure, which involved a dual verification of the breaker's position and the valve's position and was documented in the Control Room logs. At 1600 hrs the sample was taken and completed by the chemist. The valve was not closed at this time yet the breaker was racked out; in addition, no log entry was found for this action. Subsequently, at 0218 hours on November 20, 1985, when another pressurizer sample was to be taken, as the operator racked in the valve's breaker, valve HV-21516 was found to be open. The licensee has also identified these findings and has issued a licensee event report, LER. 85-22, which describes the event. The licensee has committed to perform a root cause analysis of the event. This item remains open pending further review of the event. Open Item (85-32-01).

9. Plant Trip of December 5, 1985

The NRC Region V staff met with representatives of the licensee on December 11, 1985 at the request of the NRC. The purpose of the meeting was to review the sequence of events for the December 5, 1985 plant trip, corrective actions taken, and actions taken to improve the overall plant operational program.

The licensee presented an overview of the events on December 5, 1985. The plant was at 91% power beginning final preparation to increase power to 100%. During the day shift, a portion of the Integrated Control System (ICS) was placed into manual (Reactor Demand and Diamond Stations) so that the I&C technicians could perform a reactor coolant system flow scaling calibration. Both swing shift and the licensee's shift management coverage began at 1600 hours. Over a period of two hours, prior to shift change, the megawatt electric (MWE) production dropped by about 20 MWE. Feedwater tracings exhibited a small sawtooth cyclic characteristic. To dampen this transient, the operator placed the steam generator reactor demand stations of the ICS into manual, but this did not eliminate the oscillations. The operator then placed the reactor demand stations into auto from manual and immediately observed an increase in feedwater flow to the steam generators. To control this feedwater increase the operator took manual control of the feedwater loop demands. The operator began decreasing feedwater flow while watching the feedwater trend recorders. The feedflow to the "B" once through steam generator (OTSG) observed on the recorder began to decrease; the "A" OTSG recorder was not observed to decrease, but in fact it was decreasing. The operator continued to decrease feedwater flow, causing an underfeeding of the steam generators for the power level. This quickly increased the primary system's temperature and pressure until the plant tripped on high reactor coolant pressure.

The plant exhibited a normal response to the trip except for a 4A heater relief valve which lifted and a main steam cool safety valve which simmered and did not completely seat for approximately one hour.

The licensee's investigation has identified the following:

ICS

When the operator placed the reactor diamond station in auto, the system did not perform properly. The licensee identified a relay with a high contact resistance which prevented an error signal to the feedwater system from decaying to zero. This has been corrected by rejuvenating the relay by operating the relay several times with rated current. This procedure eliminated the high contact resistance. The licensee also identified twenty-nine relays in the ICS and NNI (non-nuclear instruments) which could potentially affect the operation of the ICS and NNI if the relays exhibited a high contact resistance; these relays were also rejuvenated. The licensee performed a series of tests prior to criticality and at various power levels on the ICS to confirm the effectiveness of this rejuvenation. During these tests no oscillations were evident.

Stuck "A" OTSG Feedwater Recorder

One of the contributory causes to the operator underfeeding the steam generators was a stuck pin on a trend recorder for feedwater flow. The stuck pin was indicating a high feedwater flow in the "A" OTSG and not to the actual plant condition of feedwater flow decreasing in response to the operator's input. The licensee was not able to identify the cause of the stuck pin. They did recalibrate and cycle the recorder numerous times, but could not duplicate the failure. Due to not having a replacement for the recorder, the licensee placed the recorder in a less significant location, and replaced it with another which had not been observed to malfunction.

Pegging Steam Controls

As a result of the licensee's corrective actions with the pegging steam controls after the reactor trip of October 2, 1985, the licensee discovered the pegging steam supply control band overlapped the setpoint of the the feedwater heater shell relief valves. The licensee's corrective actions included reducing the controller set point and increasing the relief valve lift point. After the plant trip on December 5, 1985 the 4A heater relief valve lifted, and closed when the operators secured the pegging steam to the heater. The licensee performed a functional test of the as-found condition of the pegging steam system and found that the control valves overshoot their set point when initially opened. This overshoot was sufficient to open the water relief valves. A calculation was performed to justify a reduced pressure set point of the controller. After the new set point was implemented, the same functional test was repeated and the results were satisfactory.

Operation

The licensee and a B&W representative reviewed the procedure for operating the ICS and insisted that the procedure was adequate to control the ICS. Regional management representatives disagreed, and concluded that the procedure needed more definition of what to do

with the ICS when it malfunctioned and when to do it. Changes were made to clarify the procedure and provide a definite hierarchy in putting ICS stations from manual into auto. Formal training was provided for all shifts.

Root Cause

The licensee will have their root cause group analyze the December 5, 1985 trip and review the corrective actions taken and provide comments.

The NRC representatives questioned the licensee on all aspects of the event. All the questions were answered to the representatives' satisfaction. No further concerns were addressed at the meeting. The inspectors observed the training provided by the licensee for all the operations crew prior to the crews assuming watch. In addition portions of the ICS relay rejuvenation program and the ICS system testing were observed.

No violations or deviations were identified.

10. Exit Meeting

The resident inspectors met with licensee representatives (denoted in paragraph 1) at various times during the reporting period and formally on December 17, 1985. The scope and findings of the inspection activities as given in this report, were summarized at the meeting. The licensee representatives acknowledged the inspectors' findings.