### U. S. NUCLEAR REGULATORY COMMISSION

### **REGION V**

- Report No: 50-312/86-42
- 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;

Inspectors:

November 27, 1986 through January 30, 1987 2-18-87 Date Signed Resident Inspector Senior 2-18-87 Date Signed Resident/Inspector 2-18-8/ Date Signed Resident Inspector 2-18-87 Date Signed W. Tenbrook, Regional Inspector 2-18-87 Ang 10-Date Signed Ang Regional Inspector Z-18-8 Date Signed Miller, Chief, Reactor Projects Section II

Approved by:

Summary:

# Inspection between November 27, 1986 and January 30, 1987 (Report 50-312/86-42)

<u>Areas Inspected</u>: This routine inspection by the Resident Inspectors and in part by two Regional Inspectors, involved the areas of operational safety verification, maintenance, surveillance, cold weather preparations, engineered safety systems walkdown, and followup items. During this inspection, Inspection Procedures 30702, 30703, 37700, 37701, 61726, 62703, 71707, 71710, 71711, 71714, 73051, 73052, 90712, 92700, 92701, 92702, 92703, and 93702 were used. The inspection involved 532 hours of effort.

Results: No violations or deviations were identified.

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- 1. Persons Contacted
  - a. Licensee Personnel
    - J. Ward, Deputy General Manager
    - \*1K. Perkins, Restart Implementation Manager
      - G. Coward, Deputy Restart Implementation Manager
    - 1J. McColligan, Assistant Manager, Nuclear Plant
    - <sup>+</sup>R. Ashley, Licensing Manager
    - D. Army, Nuclear Maintenance Manager
    - B. Croley, Nuclear Technical Manager
    - G. Cranston, Nuclear Engineering Manager
    - S. Redeker, Nuclear Operations Manager
    - J. Shetler, Implementation Manager
    - T. Tucker, Nuclear Operations Superintendent
    - M. Price, Nuclear Mechanical Maintenance Superintendent
    - L. Fossom, Deputy Implementation Manager
    - R. Colombo, Regulatory Compliance Superintendent
    - J. Field, Nuclear Technical Support Superintendent
    - S. Crunk, Incident Analysis Group Supervisor
    - F. Kellie, Radiation Protection Superintendent
    - 15. Knight, Quality Assurance Manager
    - M. Hieronimos, Assistant to the Operations Superintendent
    - D. Eichorn, Supervisor, Emergency Preparedness Restart
    - R. Myers, Supervisor, Emergency Preparedness
    - P. Bosakowski, Assistant to Manager, Nuclear Engineering
    - C. Stephenson, Senior Regulatory Compliance Engineer
    - B. Daniels, Supervisor, Electrical Engineering
    - J. Irwin, Supervisor, I&C Maintenance
    - D. Prosch, I&C Engineer
    - C. Linkhart, Electrical Maintenance Superintendent
    - R. Cherba, Quality Engineering Supervisor
    - T. Shewski, Quality Engineer
    - J. Robertson, Licensing Engineer

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

\*Attended the Exit Meeting on February 6, 1987. Management analysis Company (MAC) Personnel

#### 2. Operational Safety Verification

The inspectors reviewed control room operations which included access control, staffing, observation of decay heat removal system alignment, and review of control room logs. Discussions with the shift supervisors and operators indicated understanding by these personnel of the reasons for annunciator indications, abnormal plant conditions and maintenance work in progress. The inspectors also verified, by observation of valve and switch position indications, that emergency systems were properly aligned for the cold shutdown condition of the facility.

Tours of the auxiliary, reactor, and turbine buildings, including exterior areas, were made to assess equipment conditions and plant conditions. Discussions were held with auxiliary operators while they were performing their duties, and various station logs were reviewed.

The tours also assessed the effectiveness of radiological controls and adherence to regulatory requirements. The inspectors observed plant housekeeping and cleanliness, looked for potential fire and safety hazards, and observed security and safeguards practices.

The inspector had discussions with the licensee on the licensee's Inservice Inspection program in preparation for a two week inspection by the NRC. The two week inspection, to be documented in inspection report 87-03, involved independent nondestructive testing of welds and piping.

On December 8, 1986, the decay heat removal was lost for approximately fifteen minutes. The loss was caused by the momentary loss of the 4A electrical bus during a bus transfer operation. The licensee was switching the power source of the 4A bus from the startup transformer 1 to the startup transformer 2. The operation of the two startup transformer breakers must occur within a five second time delay. The operator closed in the startup transformer 2 breaker and opened the startup transformer 1 breaker after the five seconds had elapsed. The startup transformer 2 breaker opened and power to the 4A bus was lost. The emergency diesel started and loaded the bus as expected.

The breaker supplying power to the decay heat suction valve operator was lost when the 4A bus was de-energized, therefore the decay heat pump tripped off due to its interlock. The operators restored power to the 4A bus, secured the diesel generator, and reinitiated decay heat removal with the "B" train. Incore thermocouple readings remained stable.

On January 6, 1987, the licensee experienced an "A" channel reactor protection system (RPS) actuation. This occurred while changing an indicator light bulb in the RPS. Apparently while changing the light bulb, contact was made between the metal bracket for holding identification tags and the outside edge of the light socket by metal in the light cover. In addition, on January 17, 1987, the licensee reported a second light bulb change out that caused one RPS channel to trip. This occurrence was on the "C" channel. The inspector discussed these occurrences with licensee management, and the licensee committed to investigate these occurrences for generic implications. The licensee's followup will be reviewed in the next inspection.

On January 9, 1987, the licensee reported the discovery that the control room isolation switch to isolate the existing "A" emergency diesel generator control from the control room in the event of a control room evacuation was not installed; this was contrary to the design. The licensee has taken compensatory measures until the error is corrected. This event will be followed up further in a subsequent inspection.

On January 20, 1987, the licensee informed the NRC via the ENS phone that calles for the "B" channel hot leg high point vent valve and the pressurizer high point vent valves were routed in the same fire areas and that conductors for each set of valves were located in the same cable tray. Therefore, in the event of a fire in the control room during power operations spurious operations of both the "B" channel hot leg and pressurizer vents could occur, leading to a release of reactor coolant to the containment greater than what could be made up through the makeup system in a controlled shutdown. This was contrary to the fire hazards analysis assumptions. Further inspection will be documented in future inspection reports.

No violations or deviations were identified.

## 3. Monthly Surveillance

Surveillance testing was observed and reviewed to ascertain that it was conducted in accordance with requirements. This review included consideration of whether testing was in accordance with adequate procedures, whether test instrumentation was calibrated, whether limiting conditions for operation were met, whether removal and restoration of the affected components was accomplished, whether test results conformed with procedure requirements and were reviewed by personnel other than the individual directing the test, whether the reactor operator, technician or engineer performing the test recorded the data and the data were in agreement with observations made by the inspector, and whether any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The inspector observed portions of motor operated valve analysis and testing (MOVATS) being performed as part of the licensee's ongoing motor operated valve (MOV) refurbishment program. The inspector noted an apparent improvement since the last report period in the licensee's programmatic evaluation of as-found conditions for operability and reportability through the use of occurrence description reports (ODRs).

The inspector observed portions of functional testing of the new Transamerica DeLaval Inc. (TDI) emergency diesel generator GEB2 under special test procedure STP-1019A. The testing consisted of setting the overspeed trip setting and verifying its proper functioning. The inspector observed that some of the equipment operators did not appear to be adequately briefed in advance of testing. The inspector discussed his observation with the licensee test coordinator emphasizing the need for thorough pretest briefing of all individuals participating in the test.

The inspector observed portions of performance testing of the makeup pump (MUP) under special test procedure STP-1007. This post-maintenance testing was being used to determine proper pump capacity following extensive repair of pump damage incurred during the December 26, 1985 overcooling event in which the pump suction was inadvertently isolated during pump operation. During this testing, the MUP was aligned for suction from the decay heat removal pump and discharged into the reactor coolant system. The inspector observed that additional engineering evaluation of the resulting pump data was required to determine proper pump capacity under the test alignment which differed from the normal pump

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operating alignment. The MUP testing will be addressed further in future inspections of the licensee's systems review and test program.

No violations or deviations were identified.

## 4. Monthly Maintenance

Maintenance activities for the systems and components listed below were observed and reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes or standards, and the 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 or calibration was 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 inspector observed portions of the activities to replace the upper and middle pressurizer heater bundles which were determined to have been damaged by overheating on November 21, 1986. This activity also included the weld repair of the pressurizer bolting flange surface which was found to be eroded from previous steam leakage during original startup testing when the joint was of a gasket design. Subsequent redesign of the joint had eliminated the gasket and incorporated a seal weld to preclude joint leakage.

The inspector observed portions of the modification activities to install new taps through the steam generator for sensing water level as part of the emergency feedwater initiation and control (EFIC) system.

At various times during this report period, the inspector observed refurbishment activities being conducted on motor operated valves (MOV) and valve operators as part of the licensee's ongoing MOV refurbishment program.

No violations or deviations were identified.

## 5. Cold Weather Preparations

The inspector reviewed the licensee's protective measures for systems susceptible to freezing under cold weather conditions. IE Bulletin 79-24, dated September 27, 1979 had requested licensees to review their plants to determine that adequate protective measures have been taken to assure that safety related process, instrument and sampling lines do not freeze during extremely cold weather. The licensee's response, dated October 23, 1979, had identified no history of freezing problems, and concluded that the heat tracing and insulation installed on critical lines during construction were adequate protective measures. The scope and depth of the licensee's review under IE Bulletin 79-24 had been examined previously in Inspection Report 79-26. During this inspection, the inspector reviewed the program currently being implemented by the licensee. The inspector reviewed the following procedures describing the licensee's present freeze protection measures:

Casualty Procedure C.33 - Freeze Protection Nuclear Engineering Procedure NEP 5108.8 - Freeze Protection NEP 5108.5 - Piping and Equipment Insulation NEP 5204.46- Electrical Heat Tracing System

On several occasions during this report period, the inspector observed Operations personnel implementing required freeze protection measures under Casualty Procedure C.33 when the air temperature dropped below 34°F. Furthermore, the inspector observed that heat tracing and insulation were restored following modification of the auxiliary feedwater system control valves. In discussions with Operations and Maintenance personnel, no recent operational problems were identified to indicate inadequate freeze protection.

Based on this procedural review, discussions with licensee personnel, and observations, the inspector concluded that the licensee appears to be effectively implementing a continuing program of protective measures for extreme cold weather.

No violations or deviations were identified.

6. Engineered Safety Systems Walkdown

The inspector performed a walkdown of the auxiliary feedwater system with reference to Figure 1-1 of the Auxiliary Feedwater System Status Report (SSR) Revision 1, dated December 1986.

The inspector found the following apparent errors in the SSR Figure 1-1:

- a. The line drawing did not correctly show the location of crosstie valves HV-31826 and HV-31827. The actual configuration did not include these valves in the pump discharge path to each steam generator.
- b. Crosstie valves HV-31826 and HV-31827 were actually motor operated valves rather than manual valves as shown.
- c. The figure did not show the existence of valve FWS-079 or the line off the crosstie header to the nuclear service cooling water (NSCW) surge tank.
- d. The figure showed valve FV-20581 downstream of FV-28527 whereas the actual valve downstream of FV-28527 was tagged HV-20581.
- e. The figure showed valve FV-20577 downstream of FV-20531 whereas the actual valve downstream of FV-20531 was tagged SFV-20577.

- f. The figure showed valve FV-20578 downstream of FV-20528 whereas the actual valve downstream of FV-20528 was tagged SFV-20578.
- g. The figure showed valve FV-20582 downstream of FV-20532 whereas the actual valve downstream of FV-20532 was tagged HV-20582.

In addition, during the walkdown the inspector noticed a fire extinguisher lying in safety related cable raceway, L10E1 (red). The inspector identified his observations to licensee management including the Quality Assurance Manager for resolution and emphasized a need for increased attention to detail in the SSR documents. As of February 11, 1987, licensee action to correct these findings and assess their implications to other drawings was incomplete. This action will be reviewed in the next inspection.

The inspector also performed a walkdown of safety related portions of the main feedwater system including the main feedwater control valve included in recent EFIC modifications.

No violations or deviations were identified.

# 7. Licensee Event Report (LER) Followup

#### (Closed) LER 83-17-L1 - Replacement of Wilmar Electronic Relays

Inspection report 50-312/86-17 had documented evaluation of LER 83-17-LO, considered the licensee action to be reasonable and closed the LER. However, Revision 1 of the LER had also been submitted but was not closed. A review of LER 83-17-L1 (Rev. 1) was performed. Rev. 1 updated the original LER submittal by providing results for the tests performed on the subject relays. Rev. 1 did not substantially change the reasonableness of the licensee's corrective action. LER 83-17-L1 is Closed.

# (Closed) LER 84-04 - Meteorological Tower Power Failure

LER 84-04 was closed based on interviews with the licensee regarding measures taken to supply a stable of source of temporary power to the meteorological tower when the normal power supply is unavailable. A propane fueled generator has since been installed to provide a reliable temporary power source. LER 84-04 is Closed.

#### (Closed) LER 84-05 - Emergency Siren Malfunction

LER 84-05 was closed based on positive FEMA findings for siren system operation during licensee emergency preparedness exercises. No additional failures of siren transmitter/encoders have occurred. LER 84-05 is Closed.

#### (Closed) LER 84-15 - Related Incidents to Hydrogen Explosion

LER 84-15 had documented the March 19, 1984 hydrogen explosion that occurred in the turbine/generator casing. The event and followup by the NRC had been documented in inspection report 50-312/84-19 which addressed various concerns as individual NRC open items. Therefore, LER 84-15 is Closed.

# (Closed) LER 85-13 and 85-13 Rev. 1 - Diesel Generator "A" Initiation

LER 85-13 discussed an overvoltage condition which had existed on safety related and V buses 4A and 4A2. This condition involved an overvoltage caused by the number 1 startup transformer when increased load is placed on the transformer.

The licensee's action appeared adequate to the inspector and their final resolution to the problem was a proposed technical specification change to table 3.7-1. The licensee stated in the LER that the technical specification change will be submitted by fuel cycle 8.

A review conducted by NRC headquarters revealed that no immediate notification (red phone call) had been made reporting the diesel generator start of June 22, 1985. The event did meet the criteria of 50.72 (b)(2)(ii) as a four hour report which is "Any event or condition that results in manual or automatic actuation of any Engineered Safety Feature (ESF) ...". This apparent failure to report will be tracked as an unresolved item until the licensee red phone log is reviewed. (Unresolved item 86-42-01)

# (Closed) LER 85-16 and 85-16 Rev. 1 - Spurious Closure of DHR Dropline Isolation Valve

LER 85-16 discussed the loss of coolant flow to the reactor core due to a spurious high pressure signal which caused isolation of the decay heat removal system (DHR). The spurious signal caused the closure of isolation valves on the DHR system to protect the system from overpressure.

The events had occurred on August 8 and 14, 1985 with the plant in cold shutdown and had been reported by the licensee in LER 85-16 on September 5, 1985. The licensee's investigation of the events did not identify the root cause of events. However, a recorder was installed to monitor the output of the pressure transmitter (PT-21099) which generated the high pressure trip signal. This appeared to the inspector to be adequate action at the time to identify the root cause.

Three more spurious actuations of the DHR system isolation occurred on December 29, 30 and 31, 1985. During all trips of the DHR system, core coverage by water was maintained and core cooling was reestablished.

Following the spurious actuations of December, the licensee identified an improperly routed instrument cable (1R1S04B6A) which had been routed in a power cable tray. The licensee concluded that the proximity of the instrument cable to the power cables had been generating the spurious isolation signals. Licensee action in this investigation appeared adequate to the inspector. LER 85-16 Rev. 1 is closed.

# (Closed) LER 85-17-10 - HEPA Filter Bank Leak

LER 85-17-LO reported that a bypass flow path around the filtration unit of the auxiliary building "A" ventilation unit (A-542A) had been identified and had been determined to have existed since initial construction. The LER further stated that the unfiltered bypass flow alone was not sufficient to prevent the auxiliary building filter system from meeting the surveillance scandards established by Rancho Seco Technical Specifications Section 4.12.

A review of Licensee Records indicated that the reported condition had been corrected by installation of seal plates. A similar unit, A-542B, was inspected by the licensee and determined to have the seal plates. A third unit, A-536, from the same vendor, was also inspected but was determined to be of a different configuration and determined to have no visible indications of a bypass flow path.

A review by the NRC inspector of the A-542A and A-542B ventilation unit drawings, A683-5904 Chg. O, was performed. The drawing did not show a detail of the area where the bypass flow existed nor did it require installation of the seal plates. The lack of drawing details was discussed with the licensee, and the licensee committed to change drawing A683-5904 to require the installation of the seal plates to preclude recurrence of the identified condition.

The licensee's corrective action and committed action to preclude recurrence were determined by the inspector to be adequate. LER 85-17-L0 is Closed.

### (Closed) LER 85-18 - "A" EDG Output Breaker Lockout

LER 85-18 discussed an event where the 4KV safety related bus 4A had tripped from high voltage on the offsite power system while the plant was in cold shutdown. The emergency diesel generators picked up and carried the bus until the operators could reestablish normal offsite power to the bus.

When the plant operators tried to parallel the emergency diesel generators and 4A bus to the offsite electrical grid, the operator raised the diesel generator voltage to match offsite grid voltage. The generator output voltage, however, exceeded the bus trip voltage and caused a breaker lockout condition. Licensee followup and investigation appeared adequate. The diesel generator system was also included in the System Review and Test Program and will be further tested as a selected system within that program. Based on the planned testing to be performed and past licensee investigation, LER 85-18 is closed.

A review conducted by NRC headquarters revealed that no immediate notification (red phone call) had been made of the diesel generator start and loading of the 4A bus on September 7, 1985. The event did meet the criteria of 50.72 (b)(2)(ii) as a four hour report which is "Any event or condition that results in manual or automatic actuation of any Engineered Safety Feature (ESF) ... ". This apparent failure to report will be tracked as an unresolved item until the licensee's red phone log is reviewed. (Unresolved item 86-42-02)

## (Closed) LER 85-20 - Essential HVAC Flow Controller Error

LER 85-20 documented discovery of an error in the design of the essential control room and technical support center filtration units (trains A & B) in that the air flow controllers were not specified to assume automatic mode following reenergization from a loss of external power.

The licensee investigated the event and has changed their engineering procedures. This system was also a selected system as part of the System Review and Test Program and will have additional testing performed prior to startup. LER 85-20 is closed.

A review conducted by NRC headquarters revealed that no immediate notification was made on the essential HVAC system failure to function in accordance with the design basis report and technical specification 4.10 requirement to control flow to 3200 cfm  $\pm$  10%. This event did meet the criteria of 50.72 (b)(2)(i) as a four hour report which is "Any event, found while the reactor is shutdown, that, had it been found while the reactor was in operation, would have resulted in the nuclear power plant, including its principal safety barriers, being seriously degraded or being in an unanalyzed condition that significantly compromises plant safety". This apparent failure to report will be tracked as an unresolved item until the licensee red phone log is reviewed. (Unresolved item 86-42-03)

8. IE Information Notice

#### (Closed) IN-86-10 - "Safety Parameter Display System Malfunctions"

The licensee has verified receipt of IN-86-10. Several changes to the SPDS system are being implemented as a result of this notice and inspection report 86-07, open item RV-E-13. SPDS improvements unrelated to report 86-07 include positive action switches, additional area radiation monitor indications and Class 1 displays. Therefore, due to the licensee's action this Information Notice is Closed.

# 9. IE Bulletin

### (Closed) IB-86-02 - "Static O Ring Differential Pressure Switches"

The above bulletin requested the licensee to submit a report on the extent to which SOR Model 102 or 103 differential pressure switches are installed (or planned) as electrical equipment important to safety.

The licensee responded to this bulletin by letter dated January 9, 1986 from J. E. Ward to J. B. Martin. In the response the licensee stated that no SOR Model 102 and 103 differential pressure switches were installed or planned to be installed. However, the licensee had twenty-seven SOR switches, none of which were differential pressure switches. Therefore, the licensee has met the requirements of this bulletin. This item is closed. (IEB 86-02, Closed)

#### 10. Restart Inspection Items

Following the December 26, 1985 event, the NRC conducted various special investigations. One of these investigations, documented in inspection report 50-312/86-07, detailed the licensee's activities relating to the preparation of Rancho Seco for restart and identified various restart issues. Of those restart issues, the following were closed during this inspection period. (The following list identifies each restart issue using the NRC Region V restart list number.)

## RV-0-3 (Closed)

Develop Procedures for Switching From Auxiliary Feedwater (AFW) to Main Feedwater (MFW) Including Reset of AFW Valves When MFW is Reset. Assure Operator Understanding of Equipment Response. (Trip Report #73, 10/2/85 Event).

The inspector reviewed the licensee's procedure A.51 "Auxiliary Feedwater System" Rev. 31. The procedure incorporated instructions in step 7.9 for transferring steam generator feed from AFW pumps to MFW pumps. Training on this particular operating procedures was part of the licensee's operator training program, In addition, the inspector interviewed various operators and concluded their knowledge of the feedwater transfer operation was adequate. Therefore this item is closed. (Closed, RV-0-3)

#### RV-E-3 (Closed)

## Perform Root Cause Analysis for the 12/26/85 Event

As stated in inspection report 86-07, the licensee had performed an acceptable root cause analysis and issued their report which had been examined by Region V. Presently, the licensee is tracking the recommendations from the root cause report under the Quality Tracking System (QTS) to insure their implementation. Therefore, because the QTS is tracking the recommendations, this item is closed. (Closed RV-E-3)

#### RV-E-7 (Closed)

#### Complete Post Trip Report

The licensee's trip report for the December 26, 1985 event, Trip Report No. 75, had been prepared by the licensee on March 21, 1986. The Plant Review Committee had reviewed and commented on the report on April 17, 1986. A revised report had been issued on August 4, 1986. The inspector reviewed the report and found that the pertinent details of the event had been incorporated and that the event description appeared adequate. The licensee is presently tracking the recommendations with the use of the QTS system. Therefore, since a system is in place to track the licensee's generated recommendations to completion this item is closed. (Closed RV-E-7)

## RV-E-11 (Closed)

# Determine and Identify Control Room Instruments Which Fail on Loss of ICS Power

As stated in inspection report 86-07, the licensee had identified the equipment in the control room which failed on loss of ICS power. The licensee has labeled the affected equipment in the control room to permit the operators to readily identify the equipment which fails on loss of ICS. This item is closed. (Closed RV-E-11)

## RV-E-18 (Closed)

#### Prepare LER on RCS Overcooling

The licensee had submitted a revision to LER 85-25 on June 10, 1986. The LER appeared to the inspector to have highlighted the important details of the event but did not include the numerous corrective actions being implemented. The licensee's corrective actions were enumerated in the Rancho Seco Action Plan for Performance Improvement. This item is closed. (Closed RV-E-18)

No violations or deviations were identified.

#### 11. Commissioner Visit

Commissioner Carr visited the Rancho Seco site on January 21, 1987. Accompanying the Commissioner was the Regional Administrator and senior staff members of Region V. The Commissioner met with SMUD management and discussed the licensee's action plan for restart and the various improvement programs that were in progress at the site. In addition, the Commissioner toured portions of the site and walked down various systems.

No violations or deviations were identified.

#### 12. Exit Meeting

The resident inspector met with licensee representatives (noted in Paragraph 1) at various times during the report period and formally on February 6, 1987. The scope and findings of the inspection activities described in this report were summarized at the meeting. Licensee representatives acknowledged the inspector's findings.