

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report No. 50-312/85-22

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: August 12-16, 1985

Inspectors: Philip Qualls  
P. Qualls, Reactor Inspector

8/27/85  
Date Signed

Approved by: T. Young Jr.  
T. Young Jr., Chief, Engineering Section

8-27-85  
Date Signed

Summary:

Inspection during the period of August 12-16, 1985 (Report No. 50-312/85-22)

Areas Inspected: This announced inspection consisted of an inspection of licensee compliance with the requirements of 10 CFR 50 Appendix R and the fire protection program. The inspection involved a total of 183 hours onsite by one NRC inspector, 2 NRR system reviewers and 2 BNL consultants. This inspection involved activities covered in Temporary Instruction 2515/62 Rev. 2 which covers inspection procedures 37700, 37701, 41700, 42700, 64704, 72701 and 30703.

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

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## DETAILS

### 1. Persons Contacted

\*R. Rodriguez, SMUD, Assistant General Manager, Nuclear  
\*P. Oubre, SMUD, Manager, Nuclear Operations  
\*W. Spencer, SMUD, Plant Operations Supervisor  
\*L. Schwieger, SMUD, Manager, Quality Assurance  
\*L. Keilman, SMUD, Manager, Nuclear Engineering  
\*R. Dieterich, SMUD, Licensing Supervisor  
\*R. Daniels, SMUD, Supervisor, Electrical Engineer  
\*J. Field, SMUD, Technical Support Superintendent  
\*J. McColligan, SMUD, Nuclear Project Engineer  
\*M. Arata, SMUD, Safety/Fire Protection Specialist  
\*R. White, SMUD, Electrical Engineer  
\*T. Singh, SMUD, Associate Electrical Engineer  
\*A. Singh, NRC/NRR/DSI/ASB, Auxiliary Systems Engineer  
\*S. West, NRC/NRR/DE/CMEB, Fire Protection Engineer  
\*P. Qualls, NRC, Reactor Inspector  
\*K. Parkinson, BNL/NRC, Electrical Inspector  
\*A. Coppola, BNL/NRC, Systems Reviewer  
\*G. Perez, NRC, Resident Inspector  
\*J. Eckhardt, NRC, Sr. Resident Inspector  
\*S. Kammer, UESC, Lead Engineer  
\*L. Young, UESC, Lead Licensing Engineer  
\*K. Scown, Impell, Section Manager  
\*U. Witte, Impell, Senior Engineer  
\*S. Whitsett, Impell, Senior Engineer  
\*K. Payne, Impell, Principal Engineer  
\*D. Powell, Impell, Supervising Engineer  
\*B. Kolinger, Impell, Principal Engineer  
\*E. Kleinsorg, Impell, Supervising Engineer  
\*C. Robinson, Impell, Principal Engineer  
\*S. Wallsen, Impell, Senior Engineer  
\*J. Hall, Impell, Engineer  
\*J. Campbell, Impell, Engineer  
\*B. Harrison, Impell, Senior Engineer  
\*J. Saleeby, Impell, Engineer  
\*M. Kermani, Bechtel, Civil Engineer  
\*B. Leon, Bechtel, Engineer  
T. Chalian, Bechtel, Electrical Engineer  
I. Mathur, Bechtel, Electrical Engineer  
P. Hatago, Bechtel, Electrical Group Supervisor  
R. Gupta, Bechtel, Electrical Engineer  
G. Lalwani, Bechtel, Electrical Engineer

\*Denotes personnel at the exit meeting.

In addition numerous other members of licensee or contractor staff were contacted.

## 2. NRR Review Items

The following concerns were identified by the inspection team. These concerns had been identified by the licensee to the NRR project manager (PM). The inspection team discussed with the PM how he had previously told the licensee to resolve these issues as noted below:

- a. The licensee recently completed revising and updating his Fire Hazards Analysis (FHA). In this process the licensee changed fire area boundaries. The licensee determined that he could decrease the number of fire areas by incorporating several smaller areas into a number of larger areas. As a result, there are now a number of fire areas that do not have area wide suppression and/or detection as required by Appendix R. The PM had stated that no exemption request was required because these changes would be reviewed when the updated FHA was reviewed and addressed in a Safety Evaluation Report (SER).
- b. A number of fire barriers in the plant have penetrations through them which are not fire rated. An analysis was performed for each to determine its applicability. Appendix R requires that penetrations be rated at the same rating as the barrier that they pass through. These penetrations were analyzed and are listed in the FHA. The PM said that no exemption request was needed because this would be inspected during the FHA review and addressed in a SER.
- c. The Auxiliary Feed Water (AFW) Pump separation exemption request states that a deluge system will be installed to protect the AFW pumps and prevent both pumps from being disabled by a single fire. The PM had accepted a March 1986 date to complete installation of the deluge system and required the licensee to conduct hourly fire watch inspections of the area.
- d. The requirement to have the Boric Acid pumps for cold shutdown had not yet been determined. If they are required they will be needed only after 130 full power operating days from the next startup. The PM had given the licensee until November 1, 1985 to determine that the Boric Acid pump is not needed to maintain cold shutdown or to have a repair procedure in place to accomplish a repair of the pumps. November 1, 1985 was well within 130 days from their next startup.
- e. Due to some statements made by NRR when denying a previous exemption request, the licensee discussions with the PM had indicated that no exemption request was needed concerning the lack of a suppression system in the control room. The inspection team felt that an exemption was needed for this area and the licensee committed to submit one. The draft exemption request was prepared while the team was on the site.

No violations or deviations were identified.

### 3. Outstanding Exemption Requests

In accordance with 10 CFR 50.48 licensees may request exemption from meeting Appendix R requirements in areas where they have taken equivalent fire protection measures. NRR evaluates these exemption requests on a case-by-case basis to determine their acceptability. The licensee had the following exemption requests submitted for NRR review. During the inspection, the NRR reviewers examined the proposed exemption requests and the fire areas for which they apply. They identified no additional concerns with these requests. However, the following items are open pending formal review of the exemption requests by NRR.

- a. Fire Area 69, separation of Auxiliary Feedwater Pumps, requested February 28, 1985 (85-22-01)
- b. Fire Area 69, Auxiliary Feedwater Valves do not have required suppression and detection, requested February 28, 1985 (85-22-02)
- c. Fire Area 68, Cables inside containment electrical penetration area, requested February 28, 1985 (85-22-03)
- d. Fire Area 69, Nuclear Service Cooling Water Pumps, requested May 24, 1985 (85-22-04)
- e. Fire Area RG1, cables inside auxiliary building electrical penetration area, requested February 28, 1985 (85-22-05)
- f. Fire Area RB1, Auxility Building mechanical penetration area, requested February 28, 1985 (85-22-06)
- g. 72 hour cold shutdown requirement, requested February 28, 1985 (85-22-07)
- h. Fire Area 110 NSRW pumps, requested February 28, 1985 (85-22-08)
- i. Fire Area 91, NSEB roof, requested April 4, 1985 (85-22-09)
- j. Fire Area 74, Auxiliary Building roof, control room HVAC unit separation, requested May 24, 1985 (85-22-10)
- k. Fire Area 74, Auxiliary Building roof, Nuclear Service cooling water surge tank level switches, requested May 24, 1985 (85-22-11)
- l. Control Room, the licensee committed to submit to NRR for review an exemption request concerning the lack of a fire suppression system in the control room. This had not been submitted due to a misunderstanding with NRR (85-22-12) (see paragraph 2.e of this report).
- m. Fire Area 68, Reactor Coolant Pump Lube Oil Collection System, tank capacity, requested February 28, 1985 (85-22-13)

No violations or deviations were identified.



4. Facility Design - 10 CFR 50 Appendix R Compliance

The licensee is required to meet the technical requirements of Appendix R to 10 CFR 50 in the facility's design as required by 10 CFR 50.48. The Appendix R criteria specified, requires that the fire protection features provided in the facility's design be capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or remote shutdown station be free of fire damage. Systems necessary to achieve and maintain cold shutdown conditions are required to be repairable in order to achieve cold shutdown within 72 hours from either the control room or remote shutdown station.

A collective assessment of selected areas containing structures, systems and components important to safe shutdown was made by the inspection team. The following conclusions were ascertained:

a. Compliance with Section III.G.2 and III.G.3

The Rancho Seco electrical distribution system was inspected to verify compliance with Appendix R.III.G.2 and 3 requirements. This inspection was performed on a sample of components and circuits and verified by in-plant walkdown of wiring, conduits and raceways. No conditions were identified that did not conform to Appendix R requirements except as previously identified by Appendix R exemption requests.

No violations or deviations were identified.

b. Common Bus Concern

A sample of Rancho Seco circuits were evaluated to verify that circuit coordination satisfied the common bus concern. Of the areas examined, no discrepancies were identified.

No violations or deviations were identified.

c. Spurious Signal Concern

Spurious signal concerns were evaluated to determine if a fire in an area could prevent operation or cause maloperation of redundant trains of safe shutdown equipment located in the same fire area. Rancho Seco has provided switches, optical isolators and multiplexers to provide satisfactory isolation of circuits and equipment. Of the areas examined no discrepancies were identified.

No violations or deviations were identified.

d. High-Low Pressure Interface

High-Low pressure interface concerns at Rancho Seco are resolved by procedurally isolating components causing the potential problem. For example, the pressurizer relief valve and blocking valve are

kept closed by de-energizing the respective actuators. Of the areas examined no discrepancies were noted.

No violations or deviations were identified.

e. High Impedance Faults

An analysis performed by Rancho Seco demonstrated to the inspectors that high impedance faults would not result in loss of required safe shutdown circuits. Of the areas examined no discrepancies were noted.

No violations or deviations were identified.

f. Common Enclosure

The inspector examined a sample of circuits required for safe shutdown. The licensee demonstrated:

- ° That the reviewed circuits were protected electrically by buses, circuit breakers or relays and
- ° That redundant safe shutdown circuits were not routed in common enclosures.

Of the areas examined no discrepancies were noted.

No violations or deviations were identified.

g. Communications

The licensee demonstrated to the inspectors that the Rancho Seco communications system provided satisfactory redundancy to support the necessary communications during a fire. No discrepancies were noted.

No violations or deviations were identified.

5. Compliance with Sections III.G.3 and III.L.

Where it is not possible or practical to meet the requirements of Section III.G.2. of Appendix R, alternative or dedicated shutdown capability must be provided in accordance with sections III.G.3 and III.L of Appendix R. Due to the adequacy of separation and protection of redundant safe shutdown trains outside the control room, the licensee provided alternative shutdown capability for only one area (control room). This capability is independent of the control room and consists of a remote shutdown panel; local operations for the charging system, diesel generators and reactor coolant system; and, local operation of various valves and circuit breakers.

Alternative shutdown capability is provided for one division of safe shutdown systems (Train A). Train "A" is electrically isolated from the control room. Disconnect/transfer switches are provided on Train "A"

which are properly designed to provide true isolation as is discussed in Information Notice No. 85-09. Given a control room fire that damages both redundant safe shutdown trains inside the control room, Train "B" could be lost in the control room. Because of the electrical isolation features, the disconnect/transfer switches provided. Train "A" would be used to mitigate the consequences of circuit failures inside the control room and enable local control of equipment required for hot shutdown from the remote shutdown panel and other local control stations.

The remote shutdown panel provides the capability to control the auxiliary feedwater system including atmospheric dump valves. Instrumentation monitoring pressurizer pressure and level, reactor coolant system hot and cold leg temperatures, steam generator pressure and level is provided. Auxiliary feedwater flow and condensate storage tank level is provided locally. The control room alternative shutdown capability was determined to be satisfactory. The details are discussed below.

No violations or deviations were identified.

#### (1) Hot Shutdown Procedures

Based on the control room alternative shutdown methodology used by the licensee, procedures have been developed and implemented (Procedure No. C13A dated July 85) in accordance with Section III.L. of Appendix R.

The inspectors evaluated the procedure to verify the feasibility of required operator actions that provide control of process variables such as reactivity control, reactor coolant makeup, decay heat removal, process monitoring and support functions when offsite power is available and when offsite power is unavailable.

The procedure review resulted in the inspectors concluding that the performance goals for the shutdown functions could be met within the minimum threshold criteria specified in the FSAR, SER and plant technical specifications and that required operator actions were achievable.

To verify the effectiveness of the procedure, a walkdown of the procedure was conducted by the inspectors and the licensee's staff during the inspection. The licensee provided additional operations personnel to demonstrate the required operator actions. Therefore, normal plant operations were not interrupted during this activity.

The walkdown demonstrated that disconnect/transfer controls, control switches, circuit breakers, manually operated valves and other equipment required for safe shutdown were accessible and properly identified. All operations were determined to be feasible and it appeared that plant operators could accomplish them without difficulty. The operations personnel who participated in the demonstration were competent and knowledgeable of the required operator actions.

No violations or deviations were identified.

(2) Cold Shutdown Procedures

The operator actions required to achieve and maintain cold shutdown conditions for the control room fire are contained in procedure C13B dated July 1985. The procedure as written will accomplish the goals required by Appendix R.

The licensee has requested an exemption to the 72-hour cold shutdown required by Section III.L of Appendix R. The NRR systems reviewer stated that this was needed for the Rancho Seco reactor design and anticipated no difficulty in this area. The exemption request (see paragraph 3.g) had not been formally approved.

The licensee had not yet determined the necessity of the Boric Acid pumps for cold shutdown. This is addressed in paragraph 2.d.

No violations or deviations were identified.

(3) Manpower Requirements

The licensee demonstrated that the fire brigade could be manned concurrent with performing the safe shutdown procedures as required by Appendix R Section III.L.

No violations or deviations were identified.

(4) Training

The inspector verified that adequate training had been performed by the personnel required to perform the safe shutdown procedures.

No violations or deviations were identified.

6. Compliance with Section III.J, Emergency Lighting

The emergency lighting was examined to determine compliance with Appendix R Section III.J. 8-hour battery powered lights were provided in all areas required for safe shutdown and in the access and egress routes thereto.

No violations or deviations were identified.

7. Compliance with Section III.0 - Reactor Coolant Pump Oil Collection System

The lube oil collection system for the reactor coolant pumps was examined for compliance with the requirements of 10 CFR 50 Appendix R Section 0. Rancho Seco provided a lube oil collection system for the non-welded joints that will collect oil from leakage during normal or accident conditions of after a safe shutdown earthquake. The system consist of two tanks each collecting the leakage from two pumps. Each tank has capacity above the volume of one reactor coolant pump oil system. Each



tank is closed and vented. An exemption request is pending NRR review of the system capacity (see paragraph 3.m).

No violations or deviations were identified.

8. Corridor to Elevation 47 (Fire Area 47)

By letter dated March 17, 1981, the licensee requested exemption from Section III.G.2 of Appendix R to 10 CFR 50 to the extent that it requires the installation of an automatic fire suppression system in a fire area that contains redundant safe shutdown components. By letter dated January 10, 1983, NRR granted the licensee's request for exemption in Fire Area 47.

In the evaluation, NRR stated that the fire area is separated from other plant areas by 3-hour fire rated barriers. During our site audit, the licensee informed the team that four undampened ducts pass through Fire Area 47 and, therefore, the area is not separated from other plant areas by 3-hour fire rated barriers. Moreover, the licensee's March 17, 1981 letter does not state that Fire Area 47 is separated from other plant areas by 3-hour fire rated barriers.

During the site audit, the NRR CMEB reviewer walked down Fire Area 47 and the surrounding areas and reviewed the licensee's nonrated penetration analysis, which was available on site.

Based on his review of the analysis and walkdown, he concluded that the safety evaluation of the exemption request in the January 10, 1983 letter does not change. The exemption from Section III.G.2 of Appendix R to 10 CFR 50 for Fire Area 47 is, therefore, still valid.

No violations or deviations were identified.

9. Fire Protection Program

The inspection team reviewed the revised Rancho Seco fire protection program. The licensee had revised his program to ensure that, as changes are made to plant systems and structures, the FHA will be kept updated. The licensee also increased his program staffing and re-designated a number of responsibilities.

The revised plan appeared to be adequate to ensure that licensee fire protection program will be implemented and maintained.

No violations or deviations were identified.

10. Administrative Procedures

To implement the revised fire protection plan, the licensee revised a number of his administrative procedures. The inspector reviewed these requirements against BTP ASB 9.5.1. The inspector found no areas where the licensee did not comply with his previous commitments.

No violations or deviations were identified.

11. Plant Toura. Housekeeping

The housekeeping in the plant appeared to be in good order. Combustibles were controlled and not allowed to accumulate to unsafe levels.

No violations or deviations were identified.

b. Equipment

Fire protection systems and equipment appeared to be in good working condition and to be well maintained. Fire extinguishers were in place and had their current inspection tags attached. Fire doors appeared to be operable and well maintained.

No violations or deviations were identified.

12. Followup on Open Itemsa. (84-22-03) (Closed), 84-19-12 (Closed) Fire Protection Program

The licensee revised his administrative procedures to incorporate all fire protection commitments.

No violations or deviations were identified.

b. 84-19-02 (Closed), 84-22-04 (Closed), 84-22-05 (Closed) Improper Housekeeping and Storage

The revised fire protection program appears to incorporate adequate controls to prevent recurrence of these housekeeping items. During this inspection no deficiencies were noted.

No violations or deviations were identified.

c. 84-22-01 (Closed), 84-22-02 (Closed) Training

During the inspection these items were noted to have been corrected. Licensee action taken prevent recurrence appears adequate.

No violations or deviations were identified.

d. 84-22-06 (Closed) Fire Doors

During the inspection the operability of fire doors was examined. No problems were noted.

No violations or deviations were identified.

e. IN-85-09 (Closed) Isolation Transfer Switch and Post Fire Shutdown Capability

The safe shutdown circuitry was examined to ensure that a control room fire would not disable any equipment that is needed to shut the plant down from the remote shutdown panel.

No violations or deviations were identified.

13. Exit Meeting

An exit meeting was held with members of licensee staff on August 16, 1985. The items mentioned in this report were discussed at that time.