



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

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February 15, 1996

Sacramento Municipal Utility District
Rancho Seco Nuclear Generating Station
ATTN: James R. Shetler, Deputy Assistant
General Manager, Operations
14440 Twin Cities Road
Herald, California 95638-9799

SUBJECT: NRC INSPECTION REPORT 50-312/96-01


This refers to the inspection conducted by Messrs. Vincent Everett of this office and Richard Dudley of the Office of Nuclear Reactor Regulations on January 17-18, 1996 at the Rancho Seco Nuclear Generating Station facility. The purpose of the inspection was to determine whether activities authorized by the license were conducted safely and in accordance with NRC requirements. At the conclusion of the inspection, the findings were discussed with those members of your staff identified in the enclosed report.

Areas examined during the inspection are identified in the report. This inspection included a review of preparations underway for the movement of the spent fuel elements currently stored in the spent fuel pool to the Independent Spent fuel Storage Installation (ISFSI). Within these areas, the inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observation of activities in progress. The results of this inspection are documented in the enclosed report.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this inspection, we will be pleased to discuss them with you.

Sincerely,


for Ross A. Scarano, Director
Division of Nuclear Materials Safety

Docket: 50-312
72-011
License: DPR-54

Enclosure:
NRC Inspection Report
50-312/96-01

Sacramento Municipal Utility
District

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ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Inspection Report: 50-312/96-01

License: DPR-54

Licensee: Sacramento Municipal Utility District
Rancho Seco Nuclear Generating Station
14440 Twin Cities Road
Herald, California

Facility Name: Rancho Seco Nuclear Generating Station

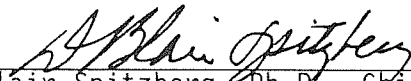
Inspection At: Rancho Seco Nuclear Generating Station
Herald, California

Inspection Conducted: January 17-18, 1996

Inspectors: J. V. Everett, Health Physicist
Nuclear Materials Licensing Branch

R. F. Dudley, Project Manager
Non-Power Reactor and Decommissioning Projects

Approved:



D. Blair Spitzberg, Ph.D., Chief
Nuclear Materials Licensing Branch

02-12-96
Date

Inspection Summary

Areas Inspected: Routine, announced inspection of activities related to the preparations for movement and storage of the reactor spent fuel from the spent fuel pool to dry cask storage at the Independent Spent Fuel Storage Installation (ISFSI).

Results:

- Activities related to the implementation of the dry cask storage program were reviewed including schedules and work activities, refurbishment of the gantry crane, completion of 10 CFR 50.59 and 72.48 reviews, plans for the examination of the spent fuel assemblies, and development of the training, radiological, and emergency preparedness programs to support the dry cask storage activities. Based on these reviews, the inspectors concluded that the licensee's program is progressing successfully toward

the implementation of requirements necessary to move spent fuel to the ISFSI (Section 1).

Summary of Inspection Findings:

- Open Item 9117-01, Emergency Callout System, was closed (Section 2).
- Inspection Followup Item 9601-01, Technical Specification change, was opened (Section 1.6).

Attachment:

- Persons Contacted and Exit Meeting

DETAILS

1 DRY CASK STORAGE OF SPENT FUEL (60847)

1.1 Rancho Seco's Dry Cask Storage System Design

Rancho Seco has purchased the Vectra NUHOMS dry cask storage system for the storage of the plant's spent fuel. The main components of the Vectra design are: (1) NUHOMS 24P stainless steel dry shielded canisters, (2) NUHOMS MP-187 steel transfer cask, and (3) reinforced concrete horizontal storage modules.

The spent fuel is loaded into the canister underwater in the spent fuel pool. The canister, while in the transfer cask, is then lifted out of the pool, drained, welded shut, and backfilled with helium. The canister provides confinement and criticality control for the storage and transfer of the spent fuel.

The transfer cask is used for transferring the canister from the spent fuel pool to the ISFSI. The transfer cask is a 100-ton steel cask designed to protect the canister during movement. The transfer cask can also be used if a canister, while in storage, develops a leak. The leaking canister is placed inside the transfer cask, and the cask is sealed, preventing further leakage.

The concrete horizontal storage modules provide radiation shielding for the storage of the canister at the ISFSI. After the canister is inserted into the horizontal storage modules, a round steel and concrete door is welded in place to provide for shielding and to restrict removal of the canister. Cooling is provided for the canisters by natural convection during storage through vents located at the top and bottom of the side walls of the horizontal storage modules.

There will be 22 horizontal storage modules located at the Rancho Seco ISFSI, each holding one canister. Each canister can hold 24 intact fuel assemblies. Two transfer casks will be stored at Rancho Seco. The fuel at Rancho Seco has been in the spent fuel pool for over 6 years, allowing for a significant decay of most of the fission products in the fuel.

Vectra obtained approval of the NUHOMS system under 10 CFR Part 72 for storage of spent fuel. Vectra has also applied for a 10 CFR Part 71 license for the MP-187 transfer casks. This will provide for a Multi-Purpose Cask (MPC) concept, allowing the NUHOMS canister planned for use at Rancho Seco to also be used with a 10 CFR Part 71 approved shipping cask. Rancho Seco applied for a 10 CFR Part 72 specific license in October 1993 for their ISFSI using the NUHOMS design. Approval from the NRC for the Rancho Seco 10 CFR Part 72 license will be delayed if the review for Vectra's 10 CFR Part 71 license determines that the NUHOMS canister requires modifications in design in order to be used as part of the Multi-Purpose Cask concept.

1.2 Schedule and Status of Activities for Dry Cask Storage

The inspector reviewed licensee reports and schedules of activities related to the dry cask storage effort. Rancho Seco has developed a detailed implementation schedule for the completion of activities related to the storage of spent fuel at the ISFSI. The schedule is reviewed during management meetings on a regular basis and is updated as activities and time frames change.

Construction is complete on the horizontal storage modules. Final delivery of the 22 modules is expected by the end of January. Construction of the canisters has not started due to potential redesign of the internal spacer concept of the canisters to meet criteria for obtaining a 10 CFR Part 71 license for the transfer cask.

Activities are progressing toward movement of fuel from the spent fuel pool to the ISFSI starting in late August 1996. The process will continue over a period of almost 1 year to complete the transfer of the fuel. In preparation for the movement of fuel to the ISFSI, a dry run practice exercise is scheduled for July 1996. Cask loading procedures are currently under development but were not reviewed during this inspection. The inspector found the licensee's schedules and preparations for the dry cask storage effort to be thorough and well documented.

1.3 Gantry Crane Refurbishment and Load Handling Issues

The inspector reviewed licensee activities related to the modification and refurbishment of the gantry crane. The gantry crane will be used to move the transfer cask and the canister loaded with spent fuel from the fuel building to the transfer vehicle outside the fuel building. In order to accomplish this, the gantry crane will operate from the cantilever portion of the crane (the end section). An analysis was completed and modifications performed on the crane to upgrade the cantilever portion of the crane from a 100 tons capacity to 130 tons. In addition, considerable refurbishing of the crane has been undertaken to ensure the crane's reliability. This will minimize problems that could occur during fuel transfer which would result in delays. Refurbishing has included the installation of a new main hoist wire rope, replacement of bridge, trolley, main hoist, and auxiliary hoist controls, addition of a radio control system, replacement of the main hoist "geared" limit switch with a programmable switch, refurbishment of the main hoist upper and lower load block, and additional limits established for crane motion in the fuel building.

Performance tests and a load test are scheduled. Refurbishing and the load tests will be completed by the end of January. An annual inspection of the crane will be conducted February 20, 1996. Crane operator training will be completed by April 1996.

NUREG 0612, "Control of Heavy Loads at Nuclear Power Plants," is being used as the basis for determining compliance for the crane. Each NUREG 0612 issue was

evaluated and documented to determine compliance with the criteria. The inspector noted that a very thorough evaluation and analysis effort was conducted by the licensee related to the NUREG 0612 issues.

Overall, the licensee had implemented a comprehensive effort to ensure that the gantry crane can be used safely and reliably during the movement of the spent fuel from the fuel pool to the transporter.

1.4 Spent Fuel Examination Prior to Storage

The inspector toured the spent fuel pool area and discussed with the licensee the planned activities for the examination of the fuel assemblies. There are 493 fuel assemblies stored in the spent fuel pool. The fuel is over 6 years old. Each fuel assembly will be examined underwater prior to loading into the canisters. Four underwater cameras have been placed to view the fuel assemblies from all four sides as the assemblies are lifted out of the rack. The process will be video taped and will be reviewed by an independent consultant. The licensee will be looking for failed fuel that could be a problem when loading the canisters. Rancho Seco knows of one failed fuel assembly. The remaining fuel assemblies are believed to be intact. The inspector determined that the plans for examining the fuel should be effective in identifying failed fuel assemblies.

person

1.5 Support Programs

The inspector reviewed the emergency planning, radiological, and training programs to determine their current status and the extent of changes being made to the programs. Overview training had been conducted for site personnel on the NUHOMS design. This training provided personnel with a very good overview of the various components of the NUHOMS system. The training partially satisfied the training requirements in the Certification of Compliance, Section 1.1.5, "Training Modules."

The emergency plan and procedures are undergoing site review and should be available to the NRC in early March for review. A matrix establishing a cross reference to the requirements of 10 CFR Part 72 with the new emergency plan was reviewed as well as the Emergency Action Levels. Preliminary comments were provided to the licensee on the need to establish additional Emergency Action Levels related to the ISFSI.

The radiological program was briefly reviewed to determine the status of activities in preparation for the movement of fuel. As low as is reasonably achievable estimates and goals had been established based on the current schedule of activities. Procedures are still under development.

The inspector noted that efforts are progressing to complete the necessary changes to the radiological, emergency planning, and training programs to support the movement of the fuel to the ISFSI.

1.6 Review of 10 CFR 50.59 Process

The inspector conducted a review of the spent fuel building modifications made to support the transfer of spent fuel to the ISFSI as described in Design Change Packages R94-0007 and R95-0001. The following modifications were among those included in the design change packages:

- Installation of a new cask washdown and support structure to replace the existing washdown pit.
- Installation of a new jib crane near the cask pit.
- Installation of cask access platforms in the cask washdown area.
- Piping modifications to supply demineralized water and spent fuel coolant pump discharge flow to the cask washdown area.

These modifications were necessitated by the licensee's selection of a new multi-purpose spent fuel cask (MP-187) which is larger and has a different configuration than the previously-analyzed cask used at Rancho Seco. The new washdown structure will be able to maintain stability (with some plastic deformation) after a drop of a fully-loaded (126.5 ton) MP-187 cask. The new jib crane (1-ton capacity) will handle loads no greater than about 1300 lb over the spent fuel cask. Seismic analyses were performed to ensure that the jib crane will not impose loads on the seismic Class 1 spent fuel building structure which would violate design criteria or exceed allowable stress levels. The spent fuel pool cooling pump piping connection will be used to fill the spent fuel cask with water before placing it in the spent fuel pool. The licensee verified that this new piping connection will not change the failure mode of the spent fuel cooling system as addressed in Section 9.4.2.5 of the Defueled Safety Analysis Report. The demineralized water connection will provide demin water to the cask washdown area for use in decontaminating the cask. The cask access platforms will allow personnel access to decontaminate the cask after it is filled with spent fuel and removed from the pool.

The reactor facility Technical Specifications were reviewed relating to the above modifications. The review revealed that some clarification to existing Technical Specifications are warranted related to installation and utilization of the new jib crane. It appeared that Technical Specification D3/4.3 prohibited the handling of loads over fuel in the spent fuel pool except for the specific loads listed in the Technical Specification. Followup discussions with licensee personnel indicated that the jib crane would not be used to handle loads over the fuel in the shipping cask unless the shield plug is in place on the dry shielded canister. The massive dry shielded canister shield plug would protect fuel in the cask from any possible damage from dropped loads which could be handled by the jib crane. Handling light loads directly over fuel in the pool is not a safety concern since the bases for Technical Specification D3/4.3 determined that the consequences of dropping

loads not greater than the combined weight of a fuel element, control element, and handling tool would be bounded by the design basis accident, i.e. drop of a single fuel assembly. The licensee agreed to clarify this Technical Specification related to movement of loads over the cask in the next license amendment submitted to NRC Headquarters. This item will be tracked as Inspection Followup Item 312/9601-01.

The inspector also reviewed the analyses prepared by the licensee which concluded that the modifications described above would not increase the probability of occurrence or the consequences of an accident or malfunction evaluated in the Defueled Safety Analysis Report. Nor would the modifications create the possibility of an accident or malfunction different from those evaluated previously in the Defueled Safety Analysis Report. Based on the above review, the inspectors determined that the facility modifications discussed above were consistent with 10 CFR 50.59 requirements.

1.7 Conclusion

Activities related to the implementation of the dry cask storage program were reviewed including schedules and work activities, refurbishment of the gantry crane, completion of 10 CFR 50.59 and 72.48 reviews, plans for the examination of the spent fuel assemblies, and development of the training, radiological, and emergency preparedness programs to support the dry cask storage activities. Based on these reviews, the inspectors concluded that the licensee's program is progressing successfully toward the implementation of requirements necessary to move spent fuel to the ISFSI.

2 FOLLOWUP (92701)

(Closed) Open Item 312/9117-01: Delayed Emergency Response Organization Callout

During the December 1991 annual emergency exercise, there was a problem with the callout procedure performed by the Sacramento Municipal Utility District (SMUD) Headquarters Security. The callout was scheduled by the scenario to occur about 8:10 a.m. The callout actually began at about 8:24 a.m. The first beeper indicating the callout was heard in the control room at about 8:37 a.m. It was surmised at the time that this was an equipment failure problem. The licensee subsequently reviewed and tested the entire system after the exercise and found no problem. The system responded and initiated as designed. The system has been tested monthly in accordance with Emergency Plan Implementing Procedure 5660, titled "Emergency Preparedness Surveillance Program," and has functioned properly in each case tested since this 1991 occurrence.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Licensee Personnel

- J. Delezenski, Nuclear Quality & Compliance Superintendent
- *J. Field, Nuclear Technology Services Superintendent
- D. Gardiner, Nuclear RP/Chem Superintendent
- R. Lawrence, Principal Mechanical Engineer
- R. Mannheimer, Sr. Licensing Engineer
- *K. Miller, Plant Closure/Decommissioning
- *S. Redeker, Plant Manager
- F. Thompson, Emergency Planning Specialist

1.2 NRC Personnel

- *S. Bajwa, Section Leader, Decommissioning
- *R. Dudley, Project Manager
- *V. Everett, Health Physicist

* Denotes persons that attended exit meeting

2 EXIT INTERVIEW

An exit meeting was conducted at the conclusion of the inspection on January 18, 1996. During this meeting, the inspectors reviewed the scope and findings of the inspection with the participants. The licensee did not identify as proprietary any information provided to, or reviewed by, the inspector.