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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SACRAMENTO MUNICIPAL UTILITY DISTRICT

DOCKET NO. 50-312

RANCHO SECO NUCLEAR GENERATING STATION

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 13
License No. DPR-54

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Sacramento Municipal Utility District (the licensee) dated November 26, 1976, as revised June 21, 1977, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR- 54 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 13, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert W. Reid, Chief
Operating Reactors Branch #4
Division of Operating Reactors

Attachment:
Changes to the Technical
Specifications

Date of Issuance: August 23, 1977

ATTACHMENT TO LICENSE AMENDMENT NO. 13

FACILITY OPERATING LICENSE NO. DPR-54

DOCKET NO. 50-312

Revise Appendix A as follows:

Remove Pages	Insert Pages
3-13	3-13
-	3-13a
3-14	3-14
3-14a	3-14a
-	4-48 - 4-50
-	4-51 - 4-57

New pages and changes on the revised pages are shown by marginal lines.

Page 3-14 is unchanged and is included for convenience only.

Limiting Conditions for Operation

3.1.6.9 Primary-to-secondary leakage through the steam generator tubes shall be limited to 1 GPM total for all steam generators. With any steam generator tube leakage greater than 1 GPM, reduce leakage to less than 1 GPM; or bring the reactor to cold shutdown conditions within 48 hours.

3.1.6.10 If reactor shutdown is required due to Section 3.1.6.9, restore the inoperable generator(s) to operable status by plugging the leaking tubes prior to increasing the average temperature above 200°F.

Bases

Every reasonable effort will be made to reduce reactor coolant leakage including evaporative losses (which may be on the order of 0.5 gpm) to the lowest possible rate and at least below 1 gpm in order to prevent a large leak from masking the presence of a smaller leak. Evaporative losses identified during startup testing of 0.5 gpm are not considered part of the 1 gpm unidentified leakage. Water inventory balances, radiation monitoring equipment, boric acid crystalline deposits, and physical inspections can disclose reactor coolant leaks. Any leak of radioactive fluid, whether from the reactor coolant system primary boundary or not can be a serious problem with respect to in-plant radioactivity contamination and cleanup or it could develop into a still more serious problem; therefore, first indications of such leakage will be followed up as soon as practicable.

Although some leak rates on the order of gpm may be tolerable from a dose point of view, especially if they are to closed systems, it must be recognized that leaks in the order of drops per minute through any of the walls of the primary system could be indicative of materials failure such as by stress corrosion cracking. If depressurization, isolation and/or other safety measures are not taken promptly, these small breaks could develop into much larger leaks, possibly into a gross pipe rupture. Therefore, the nature of the leak, as well as the magnitude of the leakage must be considered in the safety evaluation.

Bases (continued)

When the source of leakage has been identified, the situation can be evaluated to determine if operation can safely continue. This evaluation will be performed by the Operating Staff and will be documented in writing and approved by the Superintendent. Under these conditions, an allowable reactor coolant system leakage rate of 10 gpm has been established. This explained leakage rate of 10 gpm is also well within the capacity of one high pressure injection pump and makeup would be available even under the loss of off-site power condition.

If leakage is to the Reactor Building it may be identified by one or more of the following methods:

A. Sump Levels - All Reactor Building leakage is collected in the Reactor Building sumps. These sumps drain by gravity into a 120 gallon Reactor Building drain accumulation tank. The drain accumulation tank is used to measure the drain flow with level indicators at 20 gallons and 120 gallons. The tank is dumped into the East decay heat removal pump room sump. The frequency of dumping the accumulation tank and time interval between levels are recorded in the Control Room and are direct measures of the flow rate. Depending on the level at which the tank is dumped, the time to confirm a 1 gpm leak is between 40 minutes and 120 minutes.

Frequency of operation of the East DHR pump room sump pumps is recorded in the control room to provide verification of proper operation of the Reactor Building drain accumulation tank.

Since the Reactor Building drain system collects drainage from all components in the Reactor Building, a change in drain flow does not necessarily indicate a reactor coolant system leak. One method available for determining if the additional drain flow is reactor coolant is to collect drainage in the drain accumulation tank, draw a sample from the tank, and analyze the sample for boric acid concentration and radioactivity.

B. Radioactivity - Changes in the reactor coolant leakage rate in the Reactor Building may cause changes in the control room indication of the Reactor Building atmosphere particulate and gas radioactivities and of the Reactor Building radiation monitors.

The response time for the radiation monitors to detect a given leak rate are dependent on the coolant activity level and the minimum detector sensitivity.

For a leak rate of 1 gpm, the following gaseous radiation monitor response times were calculated:

Coolant Activity	Response Time
1% defective fuel	67 seconds
0.1% defective fuel	5.3 minutes

The airborne particulate radiation monitor response time is dependent upon the speed of filter paper advance which, during normal operation, will be the slow speed. Thus, assuming either 0.1 percent defective fuel and a 1 gpm leak or expected corrosion product activity and a 1 gpm leak, the response time will be about 1 to 2 hours. This time period is associated with filter tape movement from the point of particle deposition to the detector. If leakage is indicated by another leak detection method, the filter paper can be manually advanced to verify that a substantial leak has occurred. By stopping the filter tape advance mechanism, an integrated sample can be taken over a short period of time (e.g. 5 minutes) for a quick evaluation of the situation.

Coolant Activity	Response Time Excluding Filter Advance
1% defective fuel	40 seconds
0.1% defective fuel	41 seconds
No defective fuel, corrosion products only	18 minutes

C. Reactor Coolant Inventory - Total reactor coolant system leakage rate is periodically determined by comparing indications of reactor power, coolant temperature, pressurizer water level and makeup tank level over a time interval. All of these indications are recorded. Since the pressurizer level is maintained essentially constant by the pressurizer level controller, any coolant leakage is replaced by coolant from the makeup tank resulting in a tank level decrease. The makeup tank capacity is 31 gallons per inch of height and each graduation on the level recorder represents 1 inch of tank height. This inventory monitoring method is capable of detecting changes on the order of 31 gallons. A 1 gpm leak would therefore be detectable within approximately one-half hour.

As described above, in addition to direct observation, the means of detecting reactor coolant leakage are based on two different principles, i.e., activity and sump level and reactor coolant inventory measurements. Two systems of different principles provide, therefore, diversified way of detecting leakage to the reactor building.

The upper limit of 30 gpm is based on the contingency of a complete loss of plant power. A 30 gpm loss of water in conjunction with a complete loss of plant power and subsequent cooldown of the reactor coolant system by the turbine bypass system (set at 1,040 psia) and steam driven emergency feedwater pump would require more than 60 minutes to empty the pressurizer from the combined effect of system leakage and contraction. This will be ample time to restore electrical power to the plant and makeup flow to the reactor coolant system.

The plant is expected to be operated in a manner such that the secondary coolant will be normally maintained within those chemistry limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is consistently not maintained within these chemistry limits, over some period of time localized corrosion could occur and might result in stress corrosion cracking. The extent of cracking during plant operation would be limited by the limitation of steam generator tube leakage between the primary coolant system and the secondary coolant system (primary-to-secondary leakage = 1 GPM). Cracks having a primary-to-secondary leakage less than this limit during operation will have an adequate margin of safety to withstand the loads imposed during normal operation and by postulated accidents. Operating plants have demonstrated that primary-to-secondary leakage of 1 GPM can be detected by monitoring the secondary coolant. Leakage in excess of this limit will require plant shutdown during which the leaking tubes will be located and plugged.

PAGES 4-48 - 4-50 ARE RESERVED FOR

SECTION 4.16

4.17 STEAM GENERATORS

Applicability

Applies to inservice inspection of the steam generator tubes.

Objective

To verify the operability of each steam generator and ensure the structural integrity of the tubes as part of the reactor coolant boundary.

Specification

Each steam generator shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 1.3.

4.17.1 Steam Generator Sample Selection and Inspection

Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting steam generators as specified in Table 4.17-1.

4.17.2 Steam Generator Tube Sample Selection and Inspection

The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.17-2. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.17-3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.17.4. The tubes selected for these inspections shall include at least 3% of the total number of tubes in both steam generators and be selected on a random basis except:

a. If experience in similar plants with similar water chemistry indicates critical areas to be inspected, then at least 50% of the tubes inspected shall be from these critical areas.

4.17.2 (continued)

b. The first sample inspection during inservice inspection (subsequent to the first inservice inspection) of each steam generator shall include:

1. All nonplugged tubes that previously had detectable wall penetrations (>20%), and

2. Tubes in those areas where experience has indicated potential problems.

c. The second and third sample inspections during each inservice inspection may be less than a full tube inspection by concentrating (selecting at least 50% of the tubes to be inspected) the inspection on those areas of the tube sheet array and on those portions of the tubes where tubes with imperfections were previously found.

d. A tube inspection (pursuant to Specification 4.17.4.5) shall be performed on each selected tube. If any selected tube does not permit the passage of the eddy current probe for a tube inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection ("Adjacent" is interpreted to mean the nearest tube capable of being inspected.) Tubes which do not permit passage of the eddy current probe will be considered as degraded tubes when classifying inspection results.

The results of each sample inspection shall be classified into one of the following three categories:

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but not more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

Note: In all inspections, previously degraded tubes must exhibit significant (>10%) further wall penetrations to be included in the above percentage calculations.

4.17.3 Inspection Frequencies

The above required inservice inspections of steam generator tubes shall be performed at the following frequencies:

a. The first inservice inspection shall be performed during the first refueling outage. Subsequent inservice inspections shall be performed at intervals of not less than 12 nor more than 24

4.17.3 Inspection Frequencies (Continued)

calendar months after the previous inspection. If two consecutive inspections following service result in all inspection results falling into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no significant additional degradation has occurred, the inspection interval may be extended to a maximum of once per 40 months.

b. If the results of the inservice inspection of a steam generator conducted in accordance with Table 4.17-2 at 40-month intervals falls in Category C-3, the inspection frequency shall be increased to at least once per 20 months. The increase in inspection frequency shall apply until a subsequent inspection meets the conditions specified in 4.17.3a and the interval can be extended to a 40-month period.

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.17-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.10,

2 A seismic occurrence greater than the Operating Basis Earthquake,

3. A loss-of-coolant accident requiring automatic actuation of the engineered safeguards, or

4. A main steam line or feedwater line break as defined in the FSAR.

4.17.4 Acceptance Criteria

a. As used in this Specification:

1. Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications of less than 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube.

4.17.4 Acceptance Criteria

3. Degraded Tube means a tube containing imperfections ≥20% of the nominal wall thickness caused by degradation.

4. Defective Tube means a tube containing an imperfection ≥40% of the nominal tube wall thickness unless higher limits are shown acceptable by analysis. Defective tubes shall be plugged.

5. Tube Inspection means an inspection of the steam generator tube from the point of entry completely to the point of exit (except as noted in 4.17.2c).

b. The steam generator shall be determined OPERABLE after completing the corresponding actions required by Table 4.17-2.

4.17.5 Reports

a. Following each inservice inspection of steam generator tubes, the number of tubes plugged in each steam generator shall be reported to the Commission within 15 days.

b. The results of the steam generator tube inservice inspection shall be included in the Annual Operating Report for the period in which this inspection was completed. This report shall include:

1. Number and extent of tubes inspected.

2. Location and percent of wall-thickness penetration for each indication of an imperfection.

3. Identification of tubes plugged.

c. Results of steam generator tube inspections which fall into Category C-3 and require notification of the Commission shall be reported pursuant to Specification 6.9 prior to resumption of plant operation. The written followup of this report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.

Bases

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the RCS will be maintained. The surveillance requirements of steam generator tubes are based on a modification of B&W - Standard Technical Specifications dated June 1, 1976. Inservice inspection

Bases (Continued)

of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion. Inservice inspection of steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken.

Wastage-type defects are unlikely with AVT chemistry treatment of the secondary coolant. However, even if a defect should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging will be required for defective tubes. Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

Whenever the results of any steam generator tubing inservice inspection fall into Category C-3, these results will be reported to the Commission pursuant to Specification 6.9 prior to resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, tests, additional eddy-current inspection and revision of the Technical Specifications, if necessary.

TABLE 4.17-1

MINIMUM NUMBER OF STEAM GENERATORS TO BE
INSPECTED DURING INSERVICE INSPECTION

Preservice Inspection	No
No. of Steam Generators per Unit	Two
First Inservice Inspection	All
Second & Subsequent Inservice Inspection	One[1]

Table Notation:

1. The inservice inspection may be limited to one steam generator on a rotating schedule encompassing 6% of the tubes in the steam generator if the results of the first or previous inspections indicate that both steam generators are performing in a like manner. Note that under some circumstances, the operating conditions in one steam generator may be found to be more severe than those in the other steam generator. Under such circumstances the sample sequence shall be modified to inspect the most severe conditions.

TABLE 4.17-2

STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S of the Tubes per S.G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug defective tubes and inspect additional 2S of the tubes in this S.G.	C-1	None	N/A	N/A
			C-2	Plug defective tubes and inspect additional 4S of the tubes in this S.G.	C-1	None
					C-2	Plug defective tubes
					C-3	Perform action for C-3 result of first sample
			C-3	Perform action for C-3 result of this sample	N/A	N/A
	C-3	Inspect all tubes in this S.G., plug defective tubes and inspect 2S of the tubes in the other S.G. Notification to NRC pursuant to specification 6.9	The other S.G. is C-1	None	N/A	N/A
			The other S.G. is C-2	Perform action for C-2 result of second sample	N/A	N/A
			The other S.G. is C-3	Inspect all tubes in each S.G. and plug defective tubes. Notification to NRC pursuant to specification 6.9	N/A	N/A

$S = \frac{6}{n}\%$ Where n is the number of steam generators inspected during an inspection

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