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50-362 San Onofre Nuclear Station, Unit 3, Southern Californ 05000362

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MIRAGLIA,F. Licensing Branch 3

SUBJECT: Forwards response to questions in NRC 800315 ltr.Also forwards "Watertight Reliability of Condensate Storage Tank & Concrete Encl Walls Under OBE Tornado Events."

SEE rpt

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September 29, 1980

Director of Nuclear Reactor Regulation
Attention: Mr. Frank Miraglia
Branch Chief
Licensing Projects Branch 3
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

Enclosed are sixty-three copies of responses to several NRC questions asked in the NRC letter dated March 15, 1979. Direct distribution of these responses will be made as part of the Amendment 21 distribution and will be in accordance with the service list provided by SCE's letter of October 29, 1979. An affidavit attesting to the fact that distribution has been completed will be provided within ten days of docketing of Amendment 21.

Also enclosed are seven (7) copies of the report referenced in the response to question 010.65. Section 1.8 of the FSAR will be revised to reflect this report in the next FSAR amendment, however no additional copies of this report will be provided.

Please let me know if you have any questions.

Very truly yours,

K P Baskin

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Responses to NRC Questions

San Onofre Nuclear Generation Station

Units 2 and 3

QUESTION	SUBJECT
010.65	Condensate Storage Capacity*
022.62 & .63	Debris in purge lines
131.33	Tendon surveillance

*Includes report "Watertight Reliability of Condensate Storage Tank and its Concrete Enclosure Walls Under DBE and Tornado Events," Bechtel Power Corp., September, 1980.

Responses to NRC Questions
San Onofre 2&3

Question 010.65 (RSP)

Your response to item 010.59 is not satisfactory. In Amendment 13, you state that the 150,000 gallon water supply from the Seismic Category I condensate storage tank is sufficient for at least two hours of hot standby and four hours for cooldown of the reactor coolant system to the point that the shutdown cooling system can be used. You also state that the 500,000 gallon non-seismic Category I Condensate storage tank is enclosed behind seismic Category I concrete walls and could be used as a backup water source. However, you did not provide sufficient information to demonstrate that these seismic Category I concrete walls will be sealed against leaks through cracks in the walls that may develop after a postulated safe shutdown earthquake. We require that you provide sufficient water from a seismic Category I source to (1) maintain the plant at hot standby conditions for four hours, and (2) allow sufficient cooldown of the reactor coolant so that the shutdown cooling system can be used, assuming the most limiting single failure. A total of twenty-four hours water supply including hot standby time will be acceptable. If you want to take credit for the 500,000 gallon non-seismic Category I condensate storage tank as a backup to the required water supply, you must shown that the seismic Category I wall that encloses the tank will not develop cracks during the SSE that will result in leakage such that the required water volume is unavailable when needed.

Response

The concrete walls that enclose the Siesmic Category II condensate storage tank, T-120, are designed as a Seismic Category I structure equavalent to a reinforced concrete water stroage tank. The design includes consideration of the hydrodynamic loads imposed on the walls by water from a failed tank during a seismic event. Water stops are provided at concrete construction joints, and watertight seals are provided at penetrations up to the maximum postulated water level. In addition, all non-Seismic Category I piping penetrating the wall will be designed and supported to Seismic Category I requirements, up to and including the nearest isolation valve. Where the nearest isolation valve is not in the immediate vicinity of the tank, additional Seismic Category I valves shall be installed.

A more detailed evaluation has been performed to verify that the Condensate Storage Tank and its concrete enclosure walls constitute a reliable storage facility to satisfy emergency cooling water requirements. The corresponding report has been submitted to the NRC as Reference 2 below.

Reference

1. See FSAR Section 2B.4.1.7 and 9.2.6, and page 3.8-124 FSAR change was made only in section 3.8.4.1.7 and page 3.8-124.

2. "Watertight Reliability of Condensate Storage Tank and its Concrete Enclosure Walls under DBE and Tornado Events" SCE submittal to NRC, dated September 29, 1980.

Question 022.62

The response to 022.53 does not demonstrate that adequate provisions are made to ensure that any debris entrained in the vented containment's atmosphere in the event of a LOCA will not prevent closure of the containment purge system isolation valve. It is our position that the ducting must be capable of remaining intact under accident conditions and that the registers in the ducts must be of sufficiently small mesh size to preclude the passage of debris which could inhibit valve closure. Therefore, either demonstrate that the currently proposed system design meets the above requirements or provide an alternative design which assures that blockage of the purge isolation valves will not occur.

Response

The mini-purge system containment isolation valves have been designed to close within 5 seconds in response to an SIAS, CIAS, or CPIS signal. In the event of a LOCA any one of the above signals will cause the valves to close within 5 seconds after receipt of the signal. In the event of a LOCA the closest break locations to the valves are at the bottom of the steam generator compartments at the opposite side of the steam generators from the valves. Between the break and the valves, there are numerous obstacles. The major obstacles are the steam generator compartment walls themselves. Other obstacles include: the steam generators, reactor coolant pumps and motors, and minor piping and structural steel supports. In addition, the secondary shield walls extend up to a minimum elevation of 85 ft - 0 in. Debris that would be generated due to a LOCA would be limited to items adjacent to the break or in the path of the jet. The only credible source of such debris is thermal insulation. As discussed in FSAR paragraph 5.2.2.1.2.5, this insulation comes in both reflective and encapsulated forms ranging in size from 1 foot by 1 foot to 3 feet by 6 feet. For this debris to become lodged in the mini-purge valves and prevent them from closing, it would have to be entrained in the jet, come around the steam generators, do a 90 degree turn at the top of the steam generator compartment, become entrained in the escaping air stream, and finally get into the 8-inch diameter mini-purge system ducting. It is not considered credible that any debris could take this path.

A second source of debris is that which would tend to collect in the ducting during normal operation. This debris is limited to a large extent by the prefilter in the supply fan suction and by the high velocities in the mini-purge system ducting which are greater than 90 ft/s during normal operation.

Although it is not considered credible for debris to be present in sufficient quantity or size to prevent the mini-purge valves from functioning, diffusers with screens, shall be added to both the inlet and outlet of the mini-purge system ducting inside the containment. The screens have a 3/8 inch square opening and consist of 0.12 inch diameter wire on 2 x 3/16 inch bars spaced at 1 3/16 inch on centers. This screen is mounted on a diffuser that attaches to the mini-purge system ducting.

The diffuser is cone shaped with openings 8 inch diameter at one end and 20 inch diameter at the other end. The diffuser is designed for a differential pressure of 60 psi and is fabricated from 1/4 inch thick plate.

The above design of cone diffuser and the screen is similar to the design used at Diablo Canyon Nuclear Power Plant designed by Pacific Gas and Electric Company.

Reference

See revised FSAR subsections 9.4.1.

Question

022.63 The response to 022.53 does not demonstrate that adequate provisions are made to ensure that any debris entrained in the vented containment's atmosphere in the event of a LOCA will not prevent closure of the containment mini-purge system isolation valve. It is our position that the ducting which houses the registers must be capable of remaining intact under accident conditions and that the registers must be capable of remaining intact under accident conditions and that the registers in the ducts must be of sufficiently small mesh size to preclude the passage of debris which could inhibit valve closure. Therefore, either demonstrate that the currently proposed system design meets the above requirements or provide an alternative design which assures that blockage of the purge isolation valves will not occur.

Response

The response to questions 022.62 has been revised to provide greater detail on the design of the mini-purge debris screens and diffusers.

Reference

See revised response to NRC Questions 022.62 and 022.53.

Responses to NRC Questions
San Onofre 2&3

Question 131.33 (RSP)

It is our position that your proposed deviations from position C.4.2 of Regulatory Guide 1.35 Revision 2 are unacceptable. You must either meet position C.4.2 in its entirety, or propose an acceptable alternate surveillance program, such as that described in Revision 3 of Regulatory Guide 1.35 (to be published) and Regulatory Guide 1.35.1 (to be published).

Response

The surveillance program will be consistent with the recommendations of Regulatory Guide 1.35, Revision 3 and Regulatory Guide 1.35.1, Revision 1.

However, if the following clarifications and exceptions to these Regulatory Guides, which are consistent with those proposed by Bechtel Power Corporation, are accepted by the NRC, they will be incorporated into the surveillance program for San Onofre Units 2&3:

A. Regulatory position C.7.2 requires an investigation if the elongation, during detensioning and retensioning, corresponding to a specific load differs by more than 5% from that recorded during installation. This provision will cause problems since the elongations at installation and during inspection may vary more than 5% due to creep, shrinkage, thermal effects, and friction. Even if the elongations after 10% post-tensioning are compared (so as to eliminate, to a great extent, the effects of creep and shrinkage), the difference may be greater than 5% due to friction. Note that at the time of installation there is minimum grease in the ducts; thus, friction is at a maximum. On the other hand, during detensioning and retensioning, there will always be some grease left in the ducts which tend to reduce friction, thus, resulting in a more uniform prestress along the length of the tendon which, in turn, results in greater total elongation. It has been Bechtel's experience that, in wire systems, the differential elongation at a specific load is up to 15% greater during inspection than it is during installation.

   It is concluded that this is a rather complex problem and many parameters affect the elongation at different points in time. The practical implication of this requirement may be a detailed investigation of the post-tensioning system (even if all the other inspection results are positive) after every surveillance which is not the intent of the regulatory guide.

   For these reasons, we intend to require only a recording of the elongation throughout the history of inspection program so that a trend can be established. This data will be used in evaluating any unusual differences in elongation during installation and inspection.

Responses to NRC Questions
San Onofre 2&3

B. Regulatory position 7.4 considers presence of significant voids within the grease filler material to be reportable. It is desirable to quantify the term "significant". Thus, we propose that voids in excess of 5% of the net duct volume (as discussed in part B of Regulatory Guide 1.35, Revision 3) should be considered reportable. In determining the void volume, due consideration should be given to thermal conditions during installation and inspection.

In regards to presence of voids and free water, we would like to emphasize that what is more important is the condition of the wire or strand in the tendon. If wires or strands are covered with grease and free water does not cause any corrosion, voids and free water should not be considered detrimental to the integrity of the system.

Reference

See revised FSAR paragraphs 3.8.1.7.2, 16.4.6.1.6.1, and appendix 3A.1.35.