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October 5, 1983

Director, Office of Nuclear Reactor Regulation
Attention: D. M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
Systematic Evaluation Program
Topics II-3.A, II-3.B, II-3.B.1 and II.3.C
San Onofre Nuclear Generating Station
Unit 1

Your letter dated January 31, 1983 provided the draft evaluation of SEP Hydrology Topics II-3.A, "Hydrologic Description;" II-3.B, "Flooding Potential and Protection Requirements;" II-3.B.1, "Capability of Operating Plants to Cope With Design Basis Flood Conditions;" and II-3.C, "Safety Related Water Supply (Ultimate Heat Sink)." We were requested to examine the facts upon which the staff has based its evaluation and respond either by confirming that the facts are correct, or by identifying errors and supplying corrected information. Accordingly, the requested information is provided in Enclosure 1.

Please contact me if you have any questions or require additional information.

Very truly yours,

RWKrieger

R. W. Krieger
Supervising Engineer
San Onofre Unit 1 Licensing

Enclosures

cc: Document Control Desk, Washington D. C. (10)

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Enclosure 1

Comments On The Draft Safety Evaluation Report of

SEP Topics II-3.A, II-3.B, II-3.B.1 and II-3.C

Comment 1

The present San Onofre Unit 1 design basis for local precipitation is listed as "unknown" in Table 1, page 8. However, Amendment 50 to the San Onofre Unit 1 Final Safety Analysis requires the plant to be protected from probable maximum precipitation (PMP) as defined by the frontal storm of Hydrometeorological Report No. 36. Subsequent to Amendment 50, the thunderstorm defined in Section 2.4 of the San Onofre Units 2 and 3 Final Safety Analysis (FSA) was determined to result in flood conditions more severe than the frontal storm of Hydrometeorological Report No. 36. Since the intent of Amendment 50 is to assure plant protection from the most severe precipitation induced flood, the physical flood protection system was modified to safeguard against the thunderstorm defined in the San Onofre Units 2 and 3 FSA. This thunderstorm is characterized by 7.0 inches of precipitation in one hour and 12.25 inches in six hours. Table 1 should be revised accordingly.

Comment 2

Your recommendation that the design basis groundwater level should be +10 feet MLLW is discussed on page 9. However, this recommendation is inconsistent with our discussions of design basis groundwater level in our April 20, 1981 and September 12, 1982 submittals. We maintain that +5 feet MLLW is a reasonable groundwater design basis. Our April 20, 1981 and September 12, 1982 submittals should be reconsidered and your evaluation should be revised to reflect the adequacy of +5 feet MLLW as an acceptable groundwater design basis.

Comment 3

The following is stated on page 11:

> "This analysis (SEP Topic II-3.B) has not shown consideration for a postulated flood hazard resulting from seismic failure of the seawall. Should the seawall fail due to the forces resulting from the near source earthquake which generates the tsunami, a flood hazard may exist. To date SEP Topic III-6 Seismic Design Considerations, has not rendered an analysis of seismic stability of the tsunami wall. Should completion of SEP Topic III-6 demonstrate the seawall is unstable under seismic loading, further evaluations of flooding would be warranted under SEP Topic II-3.B."

The tsunami wall stability analysis and structural evaluation for appropriate design basis earthquake and tsunami loading combinations was provided in our letters dated December 8, 1981 and August 28, 1983. The results of this evaluation demonstrate that the tsunami wall satisfies current review criteria. Further evaluation of flooding due to failure of the tsunami wall is unnecessary.

Comment 4

You conclude as discussed on page 12 that PMP on the confined main plant area would produce a probable maximum flood (PMF) with a peak discharge of about 168 cfs. Our calculations show that PMP on the confined plant area would produce a PMF with a peak discharge of 136 cfs. The reason for this discrepancy cannot be determined without a review of your calculations. We recommend that your evaluation be revised based on a peak discharge in the confined plant area of 136 cfs or your calculations be provided in order to determine the reason for the discrepancy.

Comment 5

You conclude as discussed on page 12 that PMP on the drainage basin surrounding the confined plant area (Subbasins I, II, III and IV in Figure 1 of your evaluation) would produce a PMF with a peak discharge of 385 cfs. This conclusion is based on all runoff from Subbasins I and II flowing through the north drainage channel rather than over the north bluff and directly to the Pacific Ocean. However, the detailed topographical information necessary for an accurate determination of peak discharge through the north drainage channel was unavailable for your evaluation as stated on page 12. As discussed below, we performed an evaluation to determine the effects of PMP on the drainage basin surrounding the confined plant area. This evaluation is based on detailed site topographical drawings, which are provided in Enclosures 2 and 3. (Enclosure 2 provides a detailed topographical drawing of the north bluff drainage area. Enclosure 3 provides a detailed topographical drawing of the confined plant area and adjacent areas east of the confined plant area. These enclosures form a complete illustration of site drainage north of the San Onofre Units 2 and 3 powerblock. Flow arrows have been added to each drawing for clarity).

Enclosure 2 clearly shows that Area 7 (corresponding to Subbasin I in Figure 1 of your evaluation, excluding Area 2B in Enclosure 2) will flow over the north bluff and directly to the Pacific Ocean. Enclosure 2 also shows that Area 1B (part of Subbasin III) does not contribute to flow through the north drainage channel. Area 2A (Subbasin III, excluding Area 1B), Area 6 (Subbasin IV), Area 2B (part of Subbasin I) and Area 2C (Subbasin II) will flow through the north drainage channel. Our calculations show that a PMP will produce a PMF with peak discharge external to the confined plant area of 230 cfs. Your evaluation should be revised consistent with our determination of peak discharge since our evaluation is based on actual site topography.

Comment 6

You discuss on pages 13 and 14 two scenarios which were evaluated based on the degree to which the storm drain systems were clogged by debris. We contest the validity of these evaluations as discussed below:

A. You evaluated both scenarios based on a confined plant area peak discharge of 168 cfs and a peak discharge to the north drainage channel of 385 cfs. Comment 4 above presents our conclusion that the confined plant area peak discharge would be 136 cfs while Comment 5 above presents our conclusion that the peak discharge to the north drainage channel would be 230 cfs. Your evaluation of both scenarios should be revised consistent with our determinations of peak discharges.

B. You evaluated both scenarios based on operation of the twin 48 inch diameter corregated metal pipes (CMP's) at 90% capacity. The basis for this assumption is not provided in your evaluation. Our March 15, 1982 submittal discusses the engineering safeguards included in the design of the north drainage channel and the twin CMP's. The twin CMP's were designed to preclude flow degradation due to sediment and debris. Sediment deposit in the CMP's is prevented since the top of the diversion wall basin (entrance to the twin CMP's) is approximately 3 feet, 9 inches higher than the expected sediment buildup in the north drainage channel while flow through the CMP's would be sufficient to scour out any debris. Blockage of the inlet to the CMP's is prevented by the height of the diversion basin wall, the substantial inlet surface area and a screen to prevent debris intrusion to the CMP's. These engineering safeguards assure the twin CMP's would operate near full capacity during a PMF. Your evaluation should reflect these engineering safeguards or provide the basis for assuming operation at 90% capacity.

C. Your evaluation of Scenario 2 assumed that the yard drainage system is completely blocked, but the basis for this assumption is not provided. The San Onofre Unit 1 plant yard is a fully developed area covered by pavement and buildings. The yard is reasonably free from sand, silt and other loose debris. In the event of a PMF, the yard drainage system is expected to convey a significant amount of precipitation to the intake structure. Franklin Research Center (FRC), your contractor for this topic, determined the yard drainage system would discharge 150 cfs during Scenario 1 (page 24 of the FRC Technical Evaluation Report). We maintain there are no credible mechanisms that would cause complete blockage of the yard drainage system. Your evaluation of Scenario 2 should be revised to include credit for operation of the yard drainage system consistent with Scenario 1 or the basis for your assumption should be provided.

D. Due to the above concerns regarding your evaluation of flooding potential, we performed an evaluation based on our determination of peak discharges and flood protection system capabilities. Our evaluation shows that the ponded water surface elevation at the lowest point in the plant area during a PMF would be +12.61 ft. MLLW. The lowest elevation at which water could penetrate a structure housing safety related equipment is +14.0 ft. MLLW (page 13 of the FRC Technical Evaluation Report). Therefore, safety related equipment would not be flooded during a PMF. Your evaluation should be revised accordingly.

Comment 7

Ponding due to PMP on the fuel storage building and the ventilation building roofs is discussed on page 15. Compliance with current criteria was not determined since the design bases for these roofs were unavailable to FRC.

We have reviewed FRC's conclusions regarding ponding depths and resultant loads (9 inches and 46.6 psf on the fuel storage building, 7.5 inches and 38.9 psf on the ventilation building) and identified discrepancies between FRC's evaluation and our evaluation.

The roofs of these buildings are equipped with 2 inch by 8 inch scuppers located directly above the roof drains. The scuppers are 2.5 inches above the low point of the ventilation building roof and 3.5 inches above the low point of the fuel storage building roof. If the drains clog during a PMP, water will eventually start spilling through the scuppers.

Our calculations show that maximum ponding will be 5.0 inches on the ventilation building roof and 7.6 inches on the fuel storage building roof. This results in a live load of 26 psf on the ventilation building roof and 40 psf on the fuel storage building roof. The roofs were originally designed for 20 psf live load. Our calculations also show that the stress and deflection levels of the roof framing in the northern portion of the fuel storage building roof slightly exceed acceptable limits in some cases. While the need to modify the drainage/scupper system will be determined in the integrated safety assessment, your evaluation should be revised based on our evaluation of ponding depths and resultant live loads.

Comment 8

The discussion on page 17 suggests that the instruction to close the intake and outlet hydraulic stop gates be an immediate rather than subsequent operator action in the emergency procedure response to an unpredicted tsunami. Your conclusion on page 20 repeats this suggestion but specifies the emergency procedure for a predicted tsunami. The conclusion on page 20 should be revised consistent with the discussion on page 17.

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