OFFICE OF NUCLEAR REACTOR REGULATION

SECOND REQUEST FOR ADDITIONAL INFORMATION

THIRD TEN-YEAR INSERVICE INSPECTION INTERVAL RELIEF REQUEST ISI-3-31

FLAW EVALUATION OF HIGH ENERGY SCHEDULE 10S
EMERGENCY CORE COOLING SYSTEM PIPING

SAN ONOFRE NUCLEAR GENERATING STATION, UNITS 2 AND 3

SOUTHERN CALIFORNIA EDISON

DOCKET NUMBERS: 50-361 AND 50-362

By letter dated May 19, 2010, (Agencywide Document Access and Management System Accession Number ML101440381) Southern California Edison (the licensee) proposed contingency alternative evaluation criteria as shown in Relief Request ISI-3-31 for temporary acceptance of flaws in certain high energy Class 2 and 3 Emergency Core Cooling System (ECCS) schedule 10s piping at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. The licensee proposes to follow the requirements of ASME Code Case N-513-2, except that the proposed alternative in Relief Request ISI-3-31 will be applied to piping with a higher operating temperature and with a smaller diameter than permitted by the code case. The enclosure to the licensee's May 19, 2010 letter contains the information provided in support of Relief Request ISI-3-31.

By e-mail dated August 31, 2010, the NRC requested additional information in support of its review of Relief Request ISI-3-31. By letter dated December 20, 2010, the licensee responded to the staff's request for additional information. After reviewing the licensee's responses, the staff requests the following clarifications.

1. The licensee's response to NRC Question 3(2)(b) stated that through-wall flaws will be observed by daily walkdowns to confirm that the analysis conditions remain valid and that flaw size stays within the allowable limit. (1) Clarify whether the allowable through-wall flaw sizes in Tables 2 and 3 of the relief request are applicable to partial through-wall flaws. (2) If the allowable flaw sizes in Tables 2 and 3 are applicable to partial through-wall flaws, discuss how the daily walkdowns can monitor those flaws that are opened to the outside surface of the pipe (i.e., do the walkdowns require physical measurement of the flaw length?). (3) Discuss whether any candidate pipe is located in the high radiation area such that daily walkdowns or monthly ultrasonic examinations cannot be performed. In such situations, describe how inspections will be performed.

2. The licensee's response to NRC Question 5 stated that "…If ultrasonic testing is impractical due to geometry, obstructions, or other reasons, then physical measurement of the flaw will be performed…" The staff does not object to the physical measurement in the above situation. (1) However, discuss why eddy current testing or penetrant testing was not considered if ultrasonic testing is impractical. (2) The flaw length on the inside surface of the pipe may be longer than the outside surface of the pipe. The flaw may grow more at the inside surface than

at the outside surface. Discuss how the physical measurement can detect the flaw growth of the through-wall flaw to ensure structural integrity of the degraded pipe.

3. The licensee's response to NRC Question 6(2) stated that if the flaw growth is found to be at a greater rate than originally expected and operation for the operating cycle would no longer be justified, the licensee would perform a mid-cycle repair. Similarly, the licensee's response to NRC Question 13(3) stated that "…a repair or replacement shall be performed no later than when the predicted flaw size from periodic inspection or flaw growth analysis exceeds the acceptance criteria, or the next scheduled outage, whichever occurs first…". (1) Specify the acceptance criteria for the flaw growth analysis and the acceptable flaw growth rate that corresponds to each flaw size in Tables 2 and 3. Is there a growth rate that will be considered unacceptable? (2) If a detected flaw in a candidate pipe is the same size as the allowable flaw size, discuss whether the degraded pipe will be repaired or replaced at the time of discovery.

4. The licensee's response to NRC Question 7(1) stated that "…[t]here would be sufficient time following an accident initiation to evacuate personnel from areas near any known through wall flaws…" The staff does not think the evacuation of personnel is sufficient. The staff still has concerns regarding the application of the proposed relief request to flaws that result in hot steam leakage because of personnel safety and the potential that the steam may affect nearby piping systems or electrical equipment. In addition, the exiting steam may prevent physical measurement or ultrasonic examination. (1) Propose additional measures that would contain and isolate exiting steam to safeguard plant personnel and nearby safety-related components. (2) Describe how the flaw size can be measured or inspected accurately considering the presence of exiting hot steam.

5. In the last paragraph on page 9 of the enclosure to the December 20, 2010, letter, the licensee's response to NRC Question 7(2) states that "…a non-leaking flaw may develop leakage during the period between inspections. However, it is not expected to reach the critical size within one month period based on either the fracture mechanics or the leak rate evaluation…" The staff is concerned about the structural integrity of the candidate pipes if the allowable flaw sizes in Tables 2 and 3 of the relief request are the same as the associated critical crack size. Provide the ratio (safety margin) between each allowable flaw size in Tables 2 and 3 of the relief request and the corresponding critical crack size.

6. The licensee's response to NRC Question 7(3) stated that "…[t]he current Control Room dose due to a LOCA is 2.8 rem Total Effective Dose Equivalent (TEDE). This is only 2.2 rem TEDE below the 5 rem TEDE limit. ESF leakage of approximately 0.25 gpm has been estimated to result in a Control Room Dose equal to the 5 rem TEDE limit. Thus any leakage resulting from a potential flaw in the Schedule 10 piping affected by Relief Request ISI-3-31, when added to existing known leakage, must be limited to 0.25 gpm…" (1) Discuss (and provide the basis for your

conclusion) whether any of the allowable flaw sizes in Tables 2 and 3 will result in leakage more than 0.25 gpm? (2) If the leakage from a flaw exceeds 0.25 gpm, discuss whether the affected pipe will be repaired at the time of discovery (i.e., a potential for a mid-cycle repair). (3) It appears that 0.25 gpm is an acceptance criterion beyond which a leaking pipe will not be allowed to remain in service. Explain why this criterion is not part of the proposed alternative. (4) Discuss how the RCS leakage detection systems can detect and quantify a leak rate of 0.25 gpm from the candidate piping systems in the relief request.

7. The licensee's response to NRC Question 14 stated that "…Code Case N-513-2 does provide provisions where planar flaw analysis may be used to evaluate non-planar flaws under the requirements of 3(d)(1) or 3(f) of the case. This will allow the use of the relief request to evaluate non-planar flaws, such as localized pitting, or intergranular attack, if such degradation is detected…" However, the allowable flaw sizes in Tables 2 and 3 in the relief request are derived based on the assumption that the flaw is planar, not non-planar. Therefore, it appears that the allowable flaw sizes in Tables 2 and 3 of the relief request are not applicable for dispositioning the non-planar flaws in the candidate pipes. If the relief request is applicable to non-planar flaws, provide justification.