

March 13, 2012

The Honorable Barbara Boxer
Chairman, Committee on Environment
and Public Works
United States Senate
Washington, D.C. 20510

Dear Madam Chairman:

On behalf of the U.S. Nuclear Regulatory Commission (NRC), I am responding to your letter of February 8, 2012, regarding recent events at the San Onofre Nuclear Generating Station (SONGS). The specific concerns you cited related to the Unit 2 and Unit 3 steam generators, a worker fall during refueling, and an ammonia leak.

The NRC requires licensees to implement a steam generator inspection program to ensure tube integrity. In accordance with this program, a 100 percent inspection of all steam generator tubes was conducted (approximately 10,000 tubes per steam generator), during a scheduled refueling outage at Unit 2 that began on January 10, 2012. Wear (tube thinning) was observed at various locations along the tube lengths, similar to what has been observed in steam generators that are similar to those at SONGS. A limited number of unexpected wear indications were observed at a particular support structure that is unique to steam generators fabricated by Mitsubishi. These wear indications were large enough to warrant additional testing, which was performed and confirmed the structural integrity of the tubes.

Following completion of the steam generator tube testing, six tubes were plugged based on an established plugging criteria for removing tubes from service. Plugging is a method that prevents reactor water from entering a tube, thus removing it from service and stopping it from leaking to the non-radioactive portion of the steam generator. Precautionary plugging of 186 additional tubes where unexpected wear was identified also was completed.

NRC specialist inspectors and an NRC steam generator expert have been observing licensee actions during this testing as part of our normal inspection program. They also will verify that the licensee's actions meet NRC regulations and review the licensee procedures to ensure the steam generators will perform their function safely through the next operating cycle.

Unit 3 had been operating for approximately one year following replacement of the steam generators when operators in the control room received alarms on January 31, 2012, indicating that reactor cooling water was leaking into one of the steam generator's secondary, or non-radioactive side. The leak was unexpected, and the licensee responded in accordance with its procedures to perform a rapid shutdown, as a precautionary measure. The estimated leak rate was 75 gallons per day, about half the rate that would require action by the licensee.

The first indications of the leak were radiation alarms from monitors that continuously sample a vent stack for the purpose of rapidly identifying steam generator tube leaks. The small amount of radioactivity that was released through this vent stack, confirmed by NRC inspectors, was much smaller than is allowed by NRC regulations.

SONGS operators brought the unit into cold shutdown on February 2, 2012, and began steam generator tube inspections on February 12, 2012. The inspection confirmed the location of the leak was limited to one tube. NRC staff is continuing to review the licensee's evaluation of the cause of the leaking tube and the licensee's inspection of 100 percent of the tubes in both steam generators. As in Unit 2, the steam generator tubes will be pressure tested to evaluate their integrity. The root cause of the tube leak has not yet been determined. For both Units 2 and 3, SONGS will evaluate the results of their inspections to determine the appropriate length of time before the next inspection. NRC approval is not required for the licensee to restart Units 2 and 3. NRC inspectors will perform an independent evaluation of the licensee's operational assessment report and preliminary cause evaluation prior to startup.

Regarding the contract worker who fell into the refueling cavity at Unit 2 during refueling activities, he was adjusting the position of a pole-mounted light used to illuminate the refueling cavity at Unit 2 when he lost his balance and fell into the reactor cavity. At the time of the incident, all of the reactor fuel had already been removed and was in the spent fuel pool. Since the cavity was completely flooded, it was only a one-foot fall, and the flotation vest the individual was wearing prevented him from submerging more than a few feet into the water. He did not suffer any injuries.

The licensee evaluated the individual's dose as a result of falling into the water. Although the water is filtered, it does contain low levels of radioactive contamination. The licensee found small amounts of contamination on the worker's skin, which was easily removed by soap and water. The licensee also used bioassay techniques (including urine testing) to estimate any internal contamination. The total dose to the individual was estimated at less than five millirem. The allowed dose for plant workers is 5,000 millirem per year.

Finally, as a result of an ammonia leak from a tank in the turbine building, on November 1, 2011, operators at SONGS declared an alert, in accordance with the plant's approved procedures. Operators exited the alert after approximately three hours, when the leak had been isolated and ammonia levels in the turbine building had reduced sufficiently to allow personnel access. Ammonia is used for maintaining the water chemistry in the secondary water (steam cycle side) of the power plant.

The cause of the leak was attributed to operators failing to promptly find and stop a slowly rising level in the ammonia tank, which eventually resulted in the tank overflowing. The ammonia was contained within a berm around the tank; however, the ammonia vapors quickly flowed into the turbine building, causing the building to be evacuated.

Since that time, the licensee has improved the procedure related to ammonia tank level problems and improved the general maintenance performed in the secondary parts of the plant. The ammonia spill was not large enough to affect individuals offsite.

In all of these cases, there has been extensive engagement by NRC staff with the licensee, and our inspection efforts have been closely coordinated. If the NRC determines that there are any generic issues of interest resulting from these events, we will not hesitate to share that information widely through our operating experience program.

Thank you for your interest in this matter. Please contact me or Ms. Rebecca Schmidt, Director of the Office of Congressional Affairs, at (301) 415-1776, if you have any questions or would like to discuss this further.

Sincerely,

/RA/

Gregory B. Jaczko