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Southern California Edison Comments on MHI Evaluation of San Onofre Nuclear Plant Steam Generators

ROSEMEAD, Calif., March 8, 2013 — An evaluation by Mitsubishi Heavy Industries (MHI) made public today cites ineffective tube supports, dry steam and high steam flow velocity as causes of excessive wear in the steam generators MHI supplied to Southern California Edison's (SCE) San Onofre Nuclear Generating Station.

SCE previously disclosed these same causes based on its own investigation, and the Nuclear Regulatory Commission's (NRC) augmented inspection team report last July found that MHI's use of faulty computer modeling in the design process caused MHI engineers to inadequately predict the dryness of the steam, measured by void fraction, in the replacement steam generators.

MHI repeatedly reassured SCE of the efficacy of the design. During the design phase of the project, MHI advised SCE that, based on its own review and analysis, the maximum void fraction that MHI expected to occur was acceptable, did not require additional design changes or measures, and that the replacement steam generators would perform as warranted.

"SCE's own oversight of MHI's design review complied with industry standards and best practices," said Pete Dietrich, SCE senior vice president and chief nuclear officer. "SCE would never, and did not, install steam generators that it believed would impact public safety or impair reliability."

In fact, MHI states in its root cause report (page 41), that its analysis of conditions in the steam generator during the design phase (which calculated void fraction and steam flow velocity) concluded that the thermal hydraulic conditions in the San Onofre steam generators were acceptable, and specifically that there was no need to reduce void fraction.[1]

Additionally, SCE never rejected a proposed design change to address void fraction based on its impact on compliance with 10 CFR 50.59.

"At no time was SCE informed that the maximum void fraction or flow velocities estimated by MHI could contribute to the failure of steam generator tubes," said Dietrich. "At the time, the design was considered sound."

SCE is disappointed that MHI decided on its own to redact some information in its evaluation about the flaws in the computer codes. However, the NRC publicly disclosed the computer code flaws three months before MHI completed its evaluation. In addition, the corrective actions and other statements included in the

[1] MHI Root Cause Analysis, page 41: T/H condition "was judged acceptable by FIV analysis" and "T/H analysis (FIT-III) did not indicate the necessity to reduce the high steam quality (void fraction)."

evaluation make it evident that there were problems with the computer modeling that failed to predict conditions that led to the tube-to-tube wear.

SCE has proposed operating Unit 2 at 70 percent to decrease velocity and decrease steam dryness to increase damping, thus preventing the conditions that led to excessive wear. The proposed restart plan was validated using a different computer model and has been reviewed by independent experts.

The San Onofre nuclear plant is the largest source of baseload generation and voltage support in the region and is a critical asset in meeting California's summer electricity and clean energy needs. Both units at San Onofre are currently safely shut down. Unit 2 remains shut down since it was taken out of service Jan. 9, 2012, for a planned outage. Unit 3 was safely taken offline Jan. 31, 2012, after station operators detected a leak in a steam generator tube.

NRC approval is required before SCE can restart Unit 2. The repair, corrective action and restart plan for Unit 2, along with additional technical information to address questions from the NRC, are available to the public at www.SONGScommunity.com

More information, including videos that explain how a steam generator works and the role San Onofre plays in providing reliable electricity to the region, is available at www.edison.com/SONGSupdate and at www.SONGScommunity.com. San Onofre is jointly owned by SCE (78.21 percent), San Diego Gas & Electric (20 percent) and the city of Riverside (1.79 percent). Follow us on Twitter (www.twitter.com/SCE) and like us on Facebook (www.facebook.com/SCE).

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