

Tube wear detailed at CA nuke plant

Michael R. Blood, The Associated Press

LOS ANGELES (AP) — Federal regulators Thursday disclosed the most detailed information to date on damage at California's idled San Onofre nuclear power plant, where thousands of tubes that carry radioactive water have eroded at an alarming rate.

The detailed data, posted obscurely on the Nuclear Regulatory Commission website, has implications for the future of the seaside plant that has been offline since a tube break in January released traces of radiation.

The records show the extent of wear from friction and vibration in 3,401 tubes, among a total of nearly 40,000 inside the plant's four steam generators. Evidence of wear was found in 15,000 places in those tubes at varying degrees. In about 280 spots — virtually all in the Unit 3 reactor — more than 50 percent of the tube wall was worn away.

Gradual wear is common in such tubing, but the rate of erosion at San Onofre startled officials since the equipment is relatively new. The generators were replaced in 2009 and 2010 in a \$670 million overhaul.

The company has said previously that 1,300 tubes will be taken out of service, although the number is well within the margin to allow the generators to keep operating. Tubes have to be retired if more than a third of the alloy tube wall wears away.

The generators function something like a car radiator, which controls heat in a vehicle's engine. The generator tubes circulate hot, radioactive water from the reactors, which heat a bath of non-radioactive water surrounding them. That makes steam, which is used to turn turbines to make electricity.

The tubes represent a critical safety barrier — if a tube breaks, there is the potential that radioactivity can escape into the atmosphere. Also, serious leaks can drain protective cooling water from a reactor.

The four generators each have nearly 10,000 alloy tubes.

The trouble began to unfold in January, when the Unit 3 reactor was shut down as a precaution after a tube break released traces of radiation. That began a spiral of events that led to a months-long federal probe.

The NRC blamed a botched computer analysis for creating excessive vibration inside the generators that damaged tubes, with agency officials saying last month it's not known how the generators can be fixed.

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The NRC left open the possibility that one or more of the huge machines might have to be replaced.

Decaying generator tubes helped push San Onofre's Unit 1 reactor into retirement in 1992, even though it was designed to run until 2004. The following year, the Trojan nuclear plant, near Portland, Ore., was shuttered because of microscopic cracks in steam generator tubes, cutting years off its expected lifespan.

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