Troubled Nuke Plant Aims to Restart Reactor

MICHAEL R. BLOOD,Associated Press

LOS ANGELES (AP) — Eight months ago Southern California had a nuclear power plant that could generate enough electricity for 1.4 million homes. It might never be the same again.

Southern California Edison sketched out a proposal Thursday under which its long-shuttered San Onofre nuclear power plant might be stuck, perhaps permanently, in a sort of middle gear.

The company announced plans to repair and restart one of two damaged reactors, Unit 2, at reduced power to hopefully halt vibration that has caused excessive wear to scores of tubes that carry radioactive water. The outlook for its heavily damaged sister, Unit 3, appears grim and no decision on its future is expected until at least next summer.

The Nuclear Regulatory Commission is expected to take months to review the plan, and there is no timetable to restart the plant.

San Onofre, located between Los Angeles and San Diego, was long an anchor in the Southern California power supply. That clearly will change, with one reactor offline for an indefinite period and the other possibly running at no more than 70 percent power, at least initially.

With San Onofre dark, state officials patched together enough power last summer to fill the gap and avoid potential blackouts. Plans are already taking shape that envision lower output from San Onofre at least into 2013.

"Whenever you lose generation, it has implications," said San Diego Gas & Electric spokeswoman Jennifer Ramp. Contingency plans are being discussed by regional power and utility officials that could lead to new or upgraded transmission lines or power generation to account for limited or no power from San Onofre.

In the power-hungry region "the partial restart of the unit is helpful, however grid reliability risks in Southern California do not go away," said Stephanie McCorkle of the California Independent System Operator, which manages much of the state's power grid. "It remains unclear if Unit 2 will be available during the (2013) summer peak demand period and Unit 3 is offline indefinitely."

Company executives have left open the possibility that the generators in Unit 3 might be scrapped.

"The circumstances they are dealing with obviously are novel," said John Keeley, a spokesman for the Nuclear Energy Institute, an industry group. "The technical challenge here is distinctive, there is no question about that."

The trouble began Jan. 31, when the Unit 3 reactor was shut down as a precaution after a tube break. Traces of radiation escaped at the time, but officials said there was no danger to workers or neighbors. Unit 2 had been taken offline earlier that

month for maintenance, but investigators later found unexpected wear on hundreds of tubes inside steam generators in both units.

The problems center on four steam generators that were installed at San Onofre during a $670 million overhaul in 2009 and 2010. Tests found some tubes were so badly corroded that they could fail and possibly release radiation, a stunning finding inside the nearly new equipment.

In a March letter, federal regulators outlined a series of benchmarks Edison must reach to restart the plant, including determining the cause of vibration and friction that damaged tubes, and how it would be fixed and then monitored during operation.

Edison's plan calls for operating Unit 2 at reduced power for five months, then shutting it down for inspections. Company officials expressed confidence in the proposal, which followed more than 170,000 tube inspections over more than eight months.

"This is not an experiment," Pete Dietrich, senior vice president and chief nuclear officer at SCE, told reporters in a conference call.

The proposal was immediately denounced by environmentalists and anti-nuclear activists who have argued for months that restarting the plant would invite catastrophe. About 7.4 million Californians live within 50 miles of San Onofre's twin domes.

"Both these reactors are alike and neither is safe to operate," said S. David Freeman, a former head of the Los Angeles Department of Water and Power who advises Friends of the Earth. "While Edison may be under financial pressure to get one up and running, operating this badly damaged reactor at reduced power without fixing or replacing these leaky generators is like driving a car with worn-out brakes."

Meanwhile, the company is facing a state review of costs related to the long-running outage that could leave customers or shareholders with a huge bill for repairs and replacement power — a figure that had reached $165 million at midyear. The company did not update those figures Thursday.

In June, a team of federal investigators announced that a botched computer analysis resulted in design flaws that are largely to blame for unprecedented wear in the tubes.

Overall, investigators found wear from friction and vibration in 15,000 places, in varying degrees, in 3,401 tubes inside the four generators. And in about 280 spots — virtually all in the Unit 3 reactor — more than 50 percent of the tube wall was worn away.

In Unit 2, investigators found that the wall thickness had been worn away by at least 20 percent in 147 tubes. When about a third of the wall thickness wears away,

a tube is deemed too risky to keep in service. Edison has retired, or plugged, more than 500 tubes in Unit 2 because of damage or as a precaution, a number within the margin to continue operating the plant.

Gradual wear is common in such tubing, but the rate of decay at San Onofre stunned officials since the equipment was recently installed.

Dietrich said Unit 2 was susceptible to the same problems that ravaged Unit 3, but engineers believe that the extent of damage was different because of manufacturing and assembly differences that resulted in looser tubes in Unit 3. Running at lower power should correct the trouble, at least in Unit 2, he said.

The generators, which resemble massive steel fire hydrants, control heat in the reactors and operate something like a car radiator. At San Onofre, each one stands 65 feet high, weighs 1.3 million pounds, with 9,727 U-shaped tubes inside, each three-quarters of an inch in diameter. They were manufactured by Japan-based Mitsubishi Heavy Industries.

Cracked and corroded generator tubing has vexed the nation's nuclear industry for years.

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.

San Onofre is owned by SCE, San Diego Gas & Electric and the city of Riverside. The Unit 1 reactor operated from 1968 to 1992, when it was shut down and dismantled.

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