

Problems at the Davis-Besse nuclear reactor near Toledo are worse than expected

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FirstEnergy Nuclear Operating Company via AP file



FirstEnergy Nuclear Operating Company via AP file The Davis-Besse Nuclear Power Station on the shore of Lake Erie near Port Clinton.

As many as 16 critical parts in the Davis-Besse reactor lid are cracked or flawed, and the problem could get worse.

Engineers expect to find additional problems when they conduct a third round of high-tech inspections in the coming weeks.

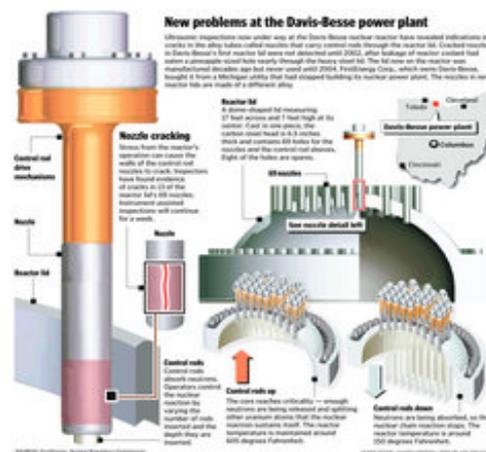
The cracks can lead to radioactive coolant seeping into reactor lid, corroding it and ultimately leaking into the heavy-walled building containing the reactor. That's what happened to Davis-Besse in 2002.

The reactor has been shut down since Feb. 28 for what owner [FirstEnergy Corp.](#) initially thought would be a fairly routine refueling and safety inspection. There is no re-start date at this point because of the time-consuming repairs that have barely begun and the planned additional inspections..

[The Nuclear Regulatory Commission](#) dispatched a special inspection team to Davis-Besse weeks ago to keep an eye on the company inspections as well as its repairs. The team is also looking into how the company has operated the plant since federal authorities allowed it to restart in 2004.

[The Union of Concerned Scientists](#), a watchdog group that does not oppose nuclear energy, has petitioned the NRC to force FirstEnergy to keep Davis-Besse shut down until it can prove the reactor can be safely operated.

The NRC team plans a public meeting with the company to explain its preliminary findings, a commission spokeswoman said. No date has been set.



The trouble-prone components in the reactor lid are corrosion-proof alloy tubes or cylinders tightly fitted and welded into the heavy steel lid.

Called "nozzles" because they resemble hose nozzles, the 69 tubes carry critical control rods into and out of the reactor, allowing operators to control the nuclear fission and operate the reactor.

Ultrasonic inspection of the nozzles turned up 12 nozzles with definite cracks and four more with indications of flaws that could become cracks, company spokesman Todd Schneider said.

So far, only three nozzles have been completely repaired, he said, a complicated, robotic procedure that involves grinding away the cracked nozzles and welds, sealing them into the lid, re-welding the affected area, grinding the new welds and then instrument-testing to make certain the repairs have been done correctly.

After the ultrasonic scans revealed the 16 nozzles with problems, the company dye-tested eleven of the 16, a procedure designed to reveal whether the cracks have allowed reactor coolant to leak into the center of the carbon-steel lid.

Schneider said two of the nozzles had such cracks, but testing revealed that only one showed a definite leak path into the carbon steel.

Engineers also plan to do an electro-magnetic test of the welds of about 50 of the remaining nozzles in order to detect weld flaws that could become cracks. "We're doing the final test to ensure all the nozzles have structural integrity to allow safe and reliable operations," he said.

Undetected nozzle cracks in the past caused unprecedented corrosion that ate a pineapple-sized hole through the 6 1/2-inch thick carbon steel, leaving only a 3/8-inch stainless steel liner to hold back pressures of more than 1 ton per square inch.

The NRC kept Davis-Besse shut down from February 2002 to March 2004 while the company installed another lid and made plant-wide repairs and design changes to many of the reactor's safety systems.

The company ordered a new reactor lid from Europe but has not yet taken delivery on it. FirstEnergy installed a lid purchased from a Michigan utility that never finished building its reactor in the 1970s; that lid is identical to the one being replaced.

And that is apparently the problem. The nozzles in the old-but-never-used reactor lid are made of the same nickel-steel alloy that has cracked in numerous reactors across the nation. New reactor lids have nozzles made of a different alloy that is engineered to take the heat stress.