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An Old Nuclear Problem Creeps Back

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First Energy Nuclear Operating Company The Davis-Besse nuclear power station on the shore of Lake Erie near Port Clinton, Ohio.

The American nuclear industry, primed to begin new construction projects for the first time in 30 years, is about as eager for an operating problem at an old reactor as the oil industry was for a well blowout on the eve of opening the Atlantic coast to oil drilling.

Nonetheless, a nuclear reactor where a hidden leak caused near-catastrophic corrosion in 2002 has experienced a second bout of the same problem.

In 2002, the plant, [Davis-Besse](#), in Oak Harbor, Ohio, developed leaks in parts on the vessel head, allowing cooling water from inside the vessel, at 2,200 pounds per square inch of pressure, to leak out.

The cooling water contains boric acid, which is used to control the speed of the nuclear reaction, and [the acid ate away a chunk of the steel the size of a football](#), leaving nothing but a thin stainless-steel liner to maintain the reactor's integrity.

Nuclear experts characterized it as a startling near-miss. Plants around the country had experienced leaks in the vessel head, but none nearly this serious.

The plant was shut for 14 months. First Energy Nuclear Operating Company, which owns it, eventually brought in a replacement head of similar design from a reactor in Midland, Mich., that had been [abandoned during construction](#).

The company assumed it had solved the problem. But recently the new vessel head showed the same leakage pattern. Once again, the parts prone to leaking are nozzles through which the control rods for the reactor pass. When the rods are inserted, they choke off the flow of neutrons that sustains the reaction; when they are withdrawn, the reactor starts up. But the nozzles are prone to a problem called "stress corrosion cracking," leading to the leaks.

It is not clear why Davis-Besse's problem is more serious than other plants have had, although it surfaced in 2002 that First Energy had won approval to delay inspections that the Nuclear Regulatory Commission wanted. (When the problem became clear, those approvals set off a [crisis of confidence](#) for the Nuclear Regulatory Commission.)

Another problem may be the metal used in the original nozzles — the same metal used in the nozzles on the Midland reactor. While the vessel head from Midland "didn't have any hours on it," said Todd Schneider, a spokesman for Davis-Besse, it is of an older design.

The reactor has 69 nozzles, and the utility **has modified 24** of them in preparation for starting up again in a few weeks. The long-term fix is yet another vessel head, with nozzles of a sturdier alloy, to be installed in 2014.

In the interim, the company said, it will opt for a shorter production run. It had been operating with one refueling every 24 months, but when it gets going again, its run will be about 100 days shorter, because “we want to be able to look at it sooner,” Mr. Schneider said.

And the reactor will run at a very slightly lower temperature, about two or three degrees less than the usual 606.5 degrees Fahrenheit at the vessel head, to slow down any damaging chemical reaction, he added. Refueling of the reactor began on Monday.