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# Crisis Underscores Fears About Safety of Nuclear Energy

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The official announcement that two reactors at an earthquake-damaged nuclear plant could be suffering meltdowns underscores the Japanese nuclear industry's troubled history, and years of grass-roots objections from a people uniquely sensitive to the ravages of nuclear destruction.

The unfolding crisis at the two reactors, both at the Fukushima Daiichi Nuclear Power Station, feeds into a resurgence of doubts about [nuclear energy's](#) safety — even as it has gained credence as a source of clean energy in a time of mounting concerns about the environmental and public health tolls of fossil fuels.

The crisis stems from failures of the cooling systems at the reactors at the 40-year-old Fukushima Daiichi plant. At a nearby nuclear plant, Daini, three more reactors lost their cooling systems, and Japanese officials were scrambling Sunday to determine whether the systems could be revived or would also need injections of cooling seawater.

Critics of nuclear energy have long questioned the viability of nuclear power in earthquake-prone regions like [Japan](#). Reactors have been designed with such concerns in mind, but preliminary assessments of the Fukushima Daiichi accidents suggested that too little attention was paid to the threat of tsunami. It appeared that the reactors withstood the powerful earthquake, but the ocean waves damaged generators and backup systems, harming the ability to cool the reactors.

It was not until Sunday that the increasingly dangerous nature of the problems at Daiichi became clear. But even on Saturday, with Reactor No. 1 there having suffered a radiation leak and an explosion, James M. Acton of the Carnegie Endowment for International Peace said the nuclear industry would be shaken. While Japan may try to point to the safety of its newer facilities, concerns may run too deep, he said. Decades ago, after the [Chernobyl](#) and [Three Mile Island accidents](#), Mr. Acton said, the nuclear industry tried to argue that newer

reactors incorporated much better safety features. “That made very little difference to the public,” he said.

Japan’s status as the only target of nuclear attack, in Hiroshima and Nagasaki in 1945, adds to the public’s sensitivity.

Benjamin Leyre, a utilities industry analyst with Exane BNP Paribas in Paris, also speaking on Saturday, said that politicians in Europe and elsewhere would almost certainly come under increased pressure to revisit safety measures.

“What is likely to come will depend a lot on how transparent the regulators in Japan are,” Mr. Leyre said. “There will be a lot of focus on whether people feel confident that they know everything and that the truth is being put in front of them.”

Over the years, Japanese plant operators, along with friendly government officials, have sometimes hidden episodes at plants from a public increasingly uneasy with nuclear power.

In 2007, an earthquake in northwestern Japan caused a fire and minor radiation leaks at the world’s largest nuclear plant, in Kashiwazaki City. An ensuing investigation found that the operator — Tokyo Electric — had unknowingly built the facility directly on top of an active seismic fault. A series of fires inside the plant after the earthquake deepened the public’s fear. But Tokyo Electric said it upgraded the facility to withstand stronger tremors and reopened in 2009.

Last year, another reactor with a troubled history was allowed to reopen, 14 years after a fire shut it down. The operator of that plant, the Monju Prototype Fast Breeder Reactor, located along the coast about 220 miles west of Tokyo, tried to cover up the extent of the fire by releasing altered video after the accident in 1995.

In the hours after the blast at Reactor No. 1, nuclear advocates argued that Daiichi’s problems were singular in many ways and stemmed from a natural disaster on a scale never before experienced in Japan. They pointed out that the excavation of fossil fuels has its own history of catastrophic accidents, including coal mine collapses and the recent BP oil spill in the Gulf of Mexico.

Some also said there might have been missteps in handling Reactor No. 1. A quick alternative source of water for cooling the destabilizing core should have been immediately available, said Nils J. Diaz, a nuclear engineer who led the United States Nuclear Regulatory Commission from 2003 to 2006 and had visited the Daiichi plant.

Mr. Diaz suggested that the Japanese might have acted too slowly to prevent overheating, including procedures that might have required the venting of small amounts of steam and radiation, rather than risk a wholesale meltdown. Fear among Japanese regulators over public reaction to such small releases may have delayed plant operators from acting as quickly as they might have, he said — a problem arising in part from the country's larger nuclear regulatory culture.

“They would rather wait and do things in a perfect manner instead of doing it as good as it needs to be now,” Mr. Diaz said. “And this search for perfection has often led to people sometimes hiding things or waiting too long to do things.”

With virtually no natural resources, Japan has considered nuclear power as an alternative to oil and other fossil fuels since the 1960s. It has regarded its expertise in nuclear power as a way to cut down on its emission of greenhouse gases and to capture energy-hungry markets in Asia.

Japan is one of the world's top consumers of nuclear energy. The country's 17 nuclear plants — boasting 55 reactors — have provided about 30 percent of its electricity needs.

To make plants resistant to earthquakes, operators are required to build them on bedrock to minimize shaking and to raise anti-tsunami seawalls for plants along the coast. But the government gives power companies wide discretion in deciding whether a site is safe.

In the case of Saturday's blast, experts said that problem was avoidable.

Mr. Diaz said that a comprehensive nuclear power plant safety program developed in the United States after the Sept. 11 attacks would have prevented a similar accident at any of the nation's nuclear facilities.