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Japan's Nuclear Crisis: Lessons for the U.S.

An 8.9 magnitude quake and tsunami are rare events. But should the U.S. rethink its own nuclear safety plans?

Disasters Fail to Follow Scripts

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The nuclear disaster in Japan is still unfolding, so it is not yet possible to fully assess it or its impact on American nuclear power policy. But we do expect the U.S. government to react the way it did following the 1986 Chernobyl nuclear disaster by evaluating what happened and identifying the necessary steps to better manage risks here at home.

The issues the government should address include whether reactors should be better protected against power outages and against earthquakes, whether fire protection deficiencies should continue to languish uncorrected, and whether emergency response plans should be broadened to better handle regional disasters.

The Japanese reactors were designed to cope with power failure for eight hours. Most U.S. reactors can cope with outages for only four hours.

The primary challenge for the Japanese reactors apparently resulted from losing both their normal and back-up power supplies. The reactors were designed to cope with this situation for only eight hours, assuming that normal or back-up power would be restored within that time. But the accident failed to follow that script, leading to serious problems cooling the reactor cores.

Most U.S. reactors are designed to cope with power outages lasting only four hours. Measures that increase the chances of restoring power within the assumed time period or providing better cooling options when that time runs out would make U.S. reactors less vulnerable.

The Japanese reactors were designed to withstand damage caused by an earthquake. They also were designed to resist a tsunami. But the one-two punch from an earthquake and a tsunami disabled numerous emergency systems and left operators with few options. The lesson? Designs that fail to take into account all the physical consequences of earthquakes may be inadequate to survive real earthquakes.

We know that earthquakes can cause fires at nuclear reactors, and U.S. reactor safety studies conclude that fire can be a dominant risk for reactor core damage by disabling primary and back-up emergency systems. Yet dozens of nuclear reactors in the U.S. have operated for years in violation of federal fire protection regulations with no plans to address these safety risks anytime soon.

Finally, there is the issue of protecting nearby communities. The breadth of the disaster in Japan overwhelmed emergency response capabilities. Reactor emergency plans in the U.S. rely on the assumption that a reactor accident would be the only demand on emergency response resources. The accident in Japan is the just the most recent reminder of the need to revisit emergency plans to ensure that people get the help they need even when disasters overlap.

Topics: Japan, earthquakes, nuclear power