

## Comparing Chernobyl and Fukushima

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### Key Facts

- The Japanese government raised the crisis level from 5 to 7 on the [International Nuclear and Radiological Event Scale](#) for the events at Fukushima Daiichi nuclear power plant, the same rating as the Chernobyl accident.
- However, the accidents at the Chernobyl and Fukushima reactors are starkly different. Notably, the reactor designs are completely different and to date, the public health consequences at Fukushima are much less severe.
- Although some damage to the uranium fuel is expected at Fukushima Daiichi, there have not been releases of radiation into the atmosphere at the levels seen during the Chernobyl accident.
- The uncontrolled release of Chernobyl reactor's fission products was exacerbated by the failure of Soviet authorities to take immediate action to protect surrounding populations. By contrast, the Japanese authorities took early steps to evacuate people, distribute potassium iodide, and restrict the transport and sale of food from the region.
- The Chernobyl accident left the area in a 30-kilometer radius around the facility as a long-term restricted zone. It is unlikely that any significant areas of land in Japan will have long-term restrictions.

### Comparing Chernobyl and Fukushima

As the situation at the Fukushima Daiichi nuclear power plant continues, some are comparing events there to the 1986 accident at the Chernobyl reactor in the Soviet-era Ukraine. The Japanese government raised the crisis level from 5 to 7 on the [International Nuclear and Radiological Event Scale](#), the same rating as the Chernobyl accident. Yet the accidents at the Chernobyl and Fukushima reactors are starkly different. Notably, the reactor designs are completely different; and to date, the public health consequences at Fukushima are much less severe.

### Accident Conditions

The Fukushima event has been rated 7 on the [International Nuclear and Radiological Event Scale](#), the same level as the 1986 Chernobyl accident. Even so, Japanese authorities estimate that radiation released at Fukushima is only 10 percent of the amount released from the Ukrainian plant. A level 7 event, the highest on the rating scale, is considered a "major accident." It applies to an event with "a major release of radioactive material with widespread health and environmental effects requiring implementation of planned and extended countermeasures," according to the [International Atomic Energy Agency](#), which sponsors the ratings. The Japanese government set the rating, which it considers "provisional" and subject to change.

Chernobyl was an old Soviet-design reactor, with less stable characteristics and no robust containment structures like most power reactors worldwide. Unconventional reactor operations at Chernobyl resulted in a runaway power surge followed by steam and hydrogen explosions and a sustained fire in the reactor. Absent a containment structure, the explosions propelled radioactive material from the reactor core high into the atmosphere and across eastern and western Europe for at least 10 days.

The magnitude 9.0 earthquake and tsunami that struck the Fukushima Daiichi reactors were much stronger than the reactors were built to withstand. The resulting loss of on- and off-site electricity temporarily halted cooling of the fuel in the reactor cores and in the used fuel pools. There have been explosions at three of the reactors as a result of hydrogen buildup, but the reactor fuel remains inside the primary containment structures. Although some damage to the uranium fuel is expected, there have not been releases of radiation into the atmosphere at the levels seen during the Chernobyl accident.

### **Emergency Response**

The uncontrolled release of Chernobyl reactor's fission products was exacerbated by the failure of Soviet authorities to take immediate action to protect surrounding populations. The most discernible health effect from Chernobyl—thyroid cancer in children—could have been mitigated by the early and widespread use of radiation protection procedures such as distribution of potassium iodide and control of the food supply in affected areas.

By contrast, the Japanese authorities took early steps to evacuate people from a 12.5-mile zone around the Fukushima plant. Authorities also distributed potassium iodide to residents near the plant and restricted the transport and sale of milk (the main source of radioactive iodine intake), leafy vegetables and other food from the region. The Japanese government is monitoring and reporting radiation levels to citizens on an ongoing basis and is providing information and health protection instructions to the public.

Besides child thyroid cancer, no other health effects have been detected in the populations around Chernobyl, according to a 2008 report of the [United Nations Scientific Committee on the Effects of Atomic Radiation](#).

Based on all information to date, no health effects are expected among the Japanese people as a result of the events at Fukushima.

### **Long-Term Health Effects**

The unique nature of the Chernobyl accident resulted in widespread airborne dispersion of radioactive cesium as fallout, which has a half-life of 30 years. The incident left the area in a 30-kilometer radius around the facility as a long-term restricted zone.

Although measurements of radioactivity in the air and water near the Fukushima plant have been evident at varying levels, wide dispersion of radioactive materials has not occurred at the facility. While there may be localized spots that will require monitoring and remediation, it is unlikely that any significant areas of land in Japan will have long-term restrictions.

