The World’s Worst Nuclear Accidents

1952 Chalk River Incident

Summary: This accident occurred when an explosion destroyed the reactor’s core, releasing radioactive material into the atmosphere. It is classified as a Level 5 event on the International Nuclear Event Scale. Another smaller nuclear incident occurred at Chalk River in 1958.

Health Effects: A huge cleanup operation followed the incident, but according to Atomic Energy of Canada Limited, few people were exposed to high levels of radiation and no adverse health effects were determined.

1957 Kyshtym, Russia

Summary: When the cooling system failed in one of the facility’s tanks, an explosion caused large amounts of radioactive material to be released. It is [This was] the third largest nuclear accident in history, and is categorized as a Level 6 event on the International Nuclear Event Scale.

Health Effects: Some studies say the disaster contaminated about 500 miles of surrounding land. The accident was allegedly kept secret by the Soviet government for many years, and the health effects are uncertain.

1957 Windscale Fire, UK

Summary: A fire erupted at the facility, spreading an unknown amount of radioactive material to other parts of Europe and Scandinavia. It [Caused by a fire, this event] is categorized as a Level 5 event on the International Nuclear Event Scale and is the largest nuclear accident in Great Britain’s history.

Health Effects: It is estimated that the accident caused more than 200 cancers in Britain, but recent studies say that number may be even higher.

1959 Santa Susana Field Laboratory, Sodium Reactor Experiment

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Summary: A partial nuclear meltdown occurred at the facility’s Sodium Reactor Experiment (SRE). The amount of radiation released is unknown because records have been destroyed or lost. Based on estimates, some consider it the “worst nuclear accident” in US history. According to Dr. Arjun Makhijani, president of the Institute for Energy and Environmental Research (IEER), the Santa Susana meltdown might have released up to 260 times more radiation than the disaster at Three Mile Island.

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Health Effects: According to a study funded by the California legislature, this event could have caused up 1,800 cases of cancer in the San Fernando and Simi Valleys. A 2007 study done by University of Michigan epidemiologist Dr. Hal Morgenstern, found people living within two miles of Santa Susana had a 60 percent greater chance of getting certain types of cancers.

1961 SL-1 Incident

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Summary: The SL-1, a United States Army experimental nuclear power reactor, exploded and killed three of its operators, making the incident the first fatal nuclear reactor accident in the United States. It is considered a Level 4 event on the International Nuclear Event Scale.

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Health Effects: The amount of released contamination is considered minimal because much of the radioactive material was contained in the reactor building and because the reactor was remotely located. However, some studies say about 790 people were exposed to radiation during contamination cleanup.

1970 Yucca Flat Incident

Summary: A seal broke during an underground bomb test, known as the Baneberry test, and radioactive material was spread along the northwestern coast of the United States.

Health Effects: About 86 workers were exposed to radioactive material. Two workers died from leukemia in 1974, but a U.S. Federal court case determined the incident was not the cause.

1979 Three Mile Island Disaster

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Summary: This partial nuclear meltdown occurred when the non-nuclear section of the plant failed and did not remove heat from the reactor. It is categorized as a Level 5 event on the International Nuclear Event Scale, and is considered by some to be the worst nuclear accident in U.S. commercial nuclear power plant history.

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Health Effects: According to the United States Nuclear Regulatory Commission (USNRC), about 2 million people received a relatively small dose of radiation exposure directly after the accident. USNRC claims no measurable health effects have been found but according to a 1997 study by epidemiologist Steve Wing of the University of North Carolina at Chapel Hill, lung cancer and leukemia rates downwind from the Three Mile Island reactor were two to 10 times greater than cancer rates upwind of the accident. The study claims “accident doses were positively associated with cancer incidence.”

1983 Buenos Aires Accident

Summary: This incident is classified as a Level 4 event on the International Nuclear Event Scale.

Health Effects: One operator died soon after the incident, and about 17 other people received high doses of radiation.

1986 Chernobyl Disaster

Summary: Large quantities of radioactive material were released into the atmosphere for about 10 days. The disaster is considered the worst nuclear power accident recorded in history, and is categorized as a Level 7 event, the highest on the International Nuclear Event Scale. The 2011 Fukushima nuclear disaster is the only other Level 7 event.

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Health Effects: About 30 workers and firefighters died within a few months after the incident, many suffering from acute radiation syndrome (ARS). According to the World Nuclear Association, over 1 million people were possibly exposed to radiation. A 2006 report by the UN Chernobyl Forum’s ‘Health’ expert points to an increase of thyroid cancer related to the accident: “During 1992-2000, in Belarus, Russia and Ukraine, about 4000 cases of thyroid cancer were diagnosed in children and adolescents (0–18 years).”

1987 Goiania Accident, Brazil

Summary: An abandoned radioactive medical teletherapy source was stolen and sold to a junkyard, exposing many people to radiation for about five days. It is considered a Level 5 event on the International Nuclear Event Scale.

Health Effects: According to the International Atomic Energy Agency, four people were killed and about 249 people were found with high levels of radiation exposure.

1999 Tokaimura Accident

Summary: This accident, the second to occur in Tokaimura, is categorized as a Level 4 event on the International Nuclear Event Scale. A smaller accident, known as the Donen accident, occurred at Tokaimura in 1997.

Health Effects: According to the World Nuclear Association, two workers died from incident, and a total of 119 people were exposed to high levels of radiation. Only three of these people were exposed to levels above permissible limits.

2011 Fukushima Daiichi Accident

Summary: The Fukushima Daiichi facility received huge damage from a major tsunami triggered by a 9.0 magnitude earthquake off the northeastern coast of Japan. Radioactive material was released into the atmosphere for four to six days, contaminating about 11,580 square miles of Japan. The nuclear meltdown is categorized as a Level 7 event, the highest level on the International Nuclear Event Scale. It is the only Level 7 event since the 1986 Chernobyl disaster.

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Health Effects: According to the World Nuclear Association, no deaths from radiation exposure have been linked to the accident. A 2013 report released by the World Health Organization estimates that female infants living in the most contaminated areas have a 70 percent higher risk of developing thyroid cancer, a 6 percent higher risk of developing breast cancer and a 4 percent higher risk of developing all solid cancers. Infant males exposed to contamination are 7 percent more likely to develop leukemia.