

Nuclear Information and Resource Service

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CHERNOBYL CAN HAPPEN HERE

The nuclear industry argues that a nuclear catastrophe such as occurred on April 26, 1986 at the Chernobyl nuclear power station in Ukraine is impossible in the United States. These nuclear proponents say that the accident was a unique event unrepeatable in a U.S. reactor. While significant differences in both the design and construction do exist between the Chernobyl-style reactor and U.S. commercial power reactors, a similar and potentially worse nuclear accident could happen here, spreading sickening and deadly radioactivity.

1:23 AM, April 26, 1986

Chernobyl, a RBMK water-cooled graphite moderated nuclear power station just 80 miles north of Kiev, Ukraine, was designed to make plutonium for nuclear weapons and modified to also produce electricity. Similarly, the U.S. Department of Energy operated a dual purpose (weapons grade plutonium and electricity) graphite moderated N-reactor in Hanford, WA which closed following the Chernobyl accident. The operators at Chernobyl Unit 4 were conducting a test procedure for on-line maintenance with the reactor at low power when the reactor suddenly went out of control and an explosion blew the roof off of the reactor building, disintegrating a 1000-ton concrete slab that covered the reactor core. Burning graphite and nuclear fuel sent a plume of super hot radioactive smoke and gas high into the sky. The atomic fire burned for days before Swedish authorities alerted the world to the radioactive fallout that drifted on shifting wind patterns with heavy fallout over portions of Ukraine, Belarus, Russia, Europe, Turkey and eventually the United States. Soviet authorities declared a 36-mile diameter "dead zone" surrounding the reactor site, still sealed by checkpoints today, and initiated the official evacuation of hundreds of thousands of people and perhaps the permanent abandonment of more than 600 years of continuous hu-

man habitation around the towns of Chernobyl and Pripjat. Large radioactive "hot spots" extending hundreds of miles away remain public health hazards today.

Chernobyl-related Illnesses Proliferate

While the nuclear industry and its promoters will admit only to the 31 immediate deaths of Soviet firefighters from high dose radiation exposure, to date over seven million people in the former Soviet Republics of Belarus, Russia and Ukraine are believed to have suffered medical problems and genetic damage as the direct result of Chernobyl. In Ukraine alone, more than 2.32 million people, including 452,000 children, have been treated for radiation-linked illnesses, including thyroid and blood cancers and cancerous growths according to the Ukrainian Ministry of Health.¹ The Swiss *Medical Weekly* published the findings of the Clinical Institute of Radiation Medicine and Endocrinology Research in Minsk, Belarus showing a 40% increase in cancer in the Belarus population between 1990 and 2000. Researchers used data from the country's National Cancer Registry, established in 1973, comparing the post-Chernobyl period with cancer rates before the accident.² The ever-widening effects of the Chernobyl accident are more recently documented in Sweden. The new findings reported in the *Journal of Epidemiology and Community Health* published by the British Medical Association concluded that more than 800 cancers are being attributed to the "Chernobyl-effect."³ "We've tried our best to explain it in other ways, but we can't," a researcher at Sweden's Linköping University told the Associated Press.⁴ "So then you have to believe your data." "With every statistical method we used to look at it, we see an increase (in cases) across the board. That indicates that it's a Chernobyl effect," he added.⁵

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U.S. anti-nuclear activists Michael Mariotte and Gene Stimp in front of the destroyed Chernobyl reactor

US Containments Can Fail, Including 22 American-Style Chernobyls

It is increasingly disingenuous of the nuclear industry to distance itself from a potential catastrophic accident in the United States. Considerable evidence exists that currently operating U.S. reactor containments can also fail during a severe accident. A 1990 U.S. Nuclear Regulatory Commission (NRC) study of risks associated with severe reactor accidents concluded that none of the five different U.S. designs it analyzed were capable of remaining intact during all severe accident scenarios.⁶

General Electric's Boiling Water Reactor (BWR) design is identified with flawed and inadequate containment structures. In 1972, the Atomic Energy Commission, now NRC, discontinued the licensing of GE's BWR Mark I model because of design and safety issues. One of NRC's top safety officials, Harold Denton, told a nuclear industry conference in 1985, "I don't have the same warm feeling about GE containment that I do for the larger dry containments. There has been a lot of work done on these containments, but Mark I containments, especially being smaller with lower design pressure---and in spite of the suppression pool---if you look at the WASH 1400 safety study, you'll find something like a 90% probability of containment failing."⁷ However, twenty-two of these units remain in operation in the US after retrofitting their containments with a system to give operators the option to deliberately vent an accident and radioactivity to the environment in a last-ditch effort to save the flawed structure from complete rupture.

Aging U.S. Reactors Increase the Risk of Accident and Breach of Containment

In light of ongoing deterioration of safety-related equipment and systems, the risk of component failure and an accident increases as reactors get older. Inspection and maintenance programs do not always expose this deterioration before failure. U.S. Pressurized Water Reactors (PWR) are also identified as vulnerable to failure during a variety of accident sequences, especially those affecting the highly pressurized and vitally important reactor coolant system. A significant number of steam generator tube failures--on the order of one every two years--have proven aging mechanisms, such as cracking and embrittlement, are difficult to detect and predict. Should an event such as an accident or an earthquake challenge the structural integrity of aging components, according to NRC, "analysis shows that if more than 15 (steam generator) tubes rupture during a main steam line break, the system response could lead to core melting."⁸ Moreover, the same NRC study cites "they are risk significant because the radionuclides are likely to bypass the reactor containment building."⁹

Commercial Nuclear Power as Vulnerable, Pre-Deployed Weapons of Terrorism

A catastrophic release of radioactivity can occur by intentional act. A deliberate attack or act of sabotage on vulnerable structures and the large inventories of nuclear waste stored within the reactor core and cooling ponds raises significant concerns for national security. The Chernobyl reactor had only operated for two years before the accident contaminated millions of people and large tracts of land and water with radioactivity. A typical U.S. reactor has many times more radioactivity than the failed Soviet reactor. The threat from this large inventory of radioactivity is identified in an April 2005 National Academy of Sciences classified report to Congress. After NRC unsuccessfully attempted to block release of the public version, the scientific report edited for security reasons concluded that tens of thousands of tons of irradiated fuel sitting in reactor storage ponds across the country is vulnerable to terrorist attack.¹⁰ The consequences of a successful attack could result in the drain down of cooling water in the fuel storage pond

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and an intensely hot nuclear waste fire with a catastrophic release of radioactivity. The Academy concluded that such a nuclear waste fire “would create thermal plumes that could potentially transport radioactive aerosols hundreds of miles downwind under appropriate atmospheric conditions.”¹¹

--Paul Gunter, April 2005

¹ “Chernobyl Radiation Lingers,” Associated Press, November 13, 2004

² “A national cancer registry to assess trends after the Chernobyl accident,” Clinical Institute of Radiation Medicine and Endocrinology Research, Minsk, Belarus, Swiss Medical Weekly, 2004:134:645-649.

³ “Study Links Cancer Cases In Sweden To Chernobyl,” Washington Post, November 21, 2004, p.A26

⁴ “Chernobyl Caused Sweden Cancers,” BBC News, November 20, 2004

⁵ Ibid

⁶ Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants, NUREG-1150, Vol. 1, United States Nuclear Regulatory Commission, 1990.

⁷ “Denton Urges Industry To Settle Doubts About Mark I Containment,” Inside NRC, June 09, 1986, p.1.

⁸ “Steam Generator Tube Failures,” NUREG/CR-6365, United States Nuclear Regulatory Commission, April 1996, Abstract.

⁹ Ibid

¹⁰ “The Safety and Security of Commercial Spent Nuclear Fuel Storage,” Public Report, National Research Council of the National Academy of Sciences, April 2005.

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<http://www.nirs.org/reactorwatch/security/securityhome.htm>

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¹¹ Ibid., Page 50.