Chernobyl: 25 Years Later

How did it happen?

What matters now?

Why should you care?

What happened?

- An accident caused a rapid release of heat and steam which destroyed the 1000 Megawatt Chernobyl #4 reactor
- Delay in reporting to the world created a near panic in some nearby countries, resulting in over-reaction by their governments
- Significant amounts of radioactivity were released across eastern Europe

What happened?

- About 50 people died in the disaster, almost all of whom were first responders working to stop the release of radioactivity
- Inflated estimates of long term deaths vary and have been rejected by the United Nations agency that studied the health effects of the accident

What contributed?

- The Chernobyl type reactors were a special design intended to produce weapons-grade plutonium and electricity
- The reactors were difficult to operate, needing constant adjustment
- The reactor building was destroyed by the explosion, which contributed to the release of radioactive materials

How did it happen?

- Operators were repeating an “engineering trial” on the main electrical generator
- Delay and pressure to complete the “engineering trial” led the operators to make multiple errors that contributed to the accident. It took all of these combined to create the accident
- Management controls were lax
- The errors involved bypassing automatic safety shutdowns
- Other errors resulted in the loss of control of the reactor

Why did it happen?

- The complex design made it difficult for the operators to understand the effects of their errors. Inadequate training contributed to their confusion
- A design flaw allowed operators to bypass controls that would have safely shut down the reactor. Without this flaw, the accident would not have happened

Chernobyl type reactors were unique

- The Chernobyl accident could only have happened with this type of reactor

- The combination of features set up the event
  - Special design for this reactor type
  - No containment
  - Safety shutdown bypassed
  - Five contributing operator errors

U.S. Safety Regulation

- U.S. Nuclear Regulatory Commission (NRC) licenses the design, operation, and operators at all reactors
- Safety regulations are the law: violations can lead to fines and jail
- NRC conducts on-site inspections and has resident inspectors at all 104 U.S. commercial reactors

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U.S. Safety Culture

- Nuclear industry commitment to safety culture embodied in the Institute for Nuclear Power Operations (INPO)

INPO

- INPO is an industry-supported continuous improvement program
- INPO accredits nuclear utility training programs
- All U.S. nuclear utilities share lessons learned from INPO's on-site reviews, training, and technical reports

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The significance of Chernobyl 25 years later

- Safety regulation and culture are the fundamental guarantees, globally, of safe, reliable delivery of electricity from nuclear reactors
- International cooperation ensures safety improvements are shared with all nuclear utilities through the World Association of Nuclear Operators (WANO) and international technical societies

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Why should you care about the future of nuclear energy

- Nuclear energy produces 20% of U.S. electricity and 16% worldwide
- China, India and 30 other countries are committed to building dozens of reactors
- The world wide safety record proves that lessons have been learned
- Nuclear power is being expanded to replace fossil fuels. Nuclear reactors do not emit greenhouse gasses to generate electricity

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Want more information?

ANS special web site on Chernobyl

http://www.ans.org/chernobyl

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