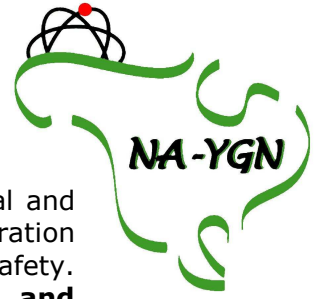


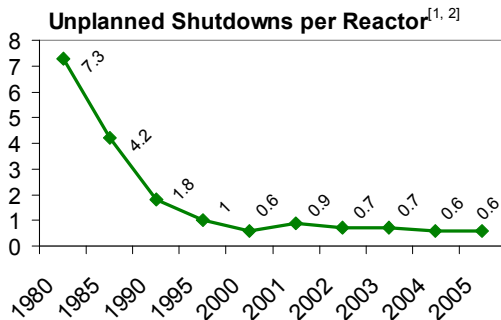
Safety of Commercial Nuclear Power Plants

Prepared by the Carolina Chapter of North American Young Generation in Nuclear



Commercial nuclear power plants in the United States are leaders in industrial and public safety. Since the first commercial U.S. nuclear power plant began operation in 1957, no incident has ever tangibly impacted public health and safety. **Continuing emphasis on safe operation, risk-informed decision making, and improved communication throughout the industry ensures that nuclear power is a safe means of generating electricity.**

🌿 How have nuclear power plants become safer?



The U.S. nuclear power industry maintains active communication on important safety issues through the Institute of Nuclear Power Operations (INPO) organization. Founded in late 1979, INPO assures that the operating experiences of one plant benefits the industry as a whole, allowing for industry-wide resolutions to common safety issues^[3]. Thanks to strong lines of communication, sharing of industry knowledge, and an ever-increasing emphasis on safety, unplanned shutdowns of U.S. nuclear reactors have decreased by nearly a factor of ten in the last 25 years.

🌿 What methods are used to ensure the health and safety of the public?

One way that the nuclear industry protects the health and safety of the public is by using Probabilistic Risk Assessment (PRA). PRA is a mathematical method that quantifies potential accident risks to the public and provides insights into the adequacy of plant design and operation. These insights aid the Nuclear Regulatory Commission (NRC) and the individual plants in determining the acceptability of a nuclear plant's overall design and operation, as well as in focusing the industry's resources on those aspects of design and operation that are most risk-important^[4].

🌿 How have tritium releases from nuclear power plants impacted public safety?

Inadvertent releases of tritium have occurred at several commercial nuclear power facilities in the United States. Although the tritium releases were unplanned, the resultant doses were within the most stringent radiation protection limits and did not pose a public health or safety threat^[5].

Radiation levels attributed to tritium were measured at a well near the Braidwood Nuclear Station (Joliet, IL). The total radiation exposure from drinking water with the detected levels of tritium for a full year (0.3 mrem) is:



- 1,000 times lower than the dose from natural background radiation
- 100 times lower than the dose from dental x-rays
- 10 times lower than a round-trip cross-country airplane flight.



However, the calculated maximum annual radiation dose to a member of the public from the Braidwood release is less than 0.1 mrem^[5].

Following the releases, the NRC revised its inspection procedures for nuclear power plants to include the evaluation of utilities' programs to inspect and assess the equipment and structures that have the potential to leak^[5]. In May 2006, the nuclear energy industry unanimously approved a voluntary groundwater protection program. This program requires that every company operating or decommissioning a nuclear power plant will implement an action plan to assure timely detection and effective response to inadvertent radiological releases in groundwater^[6].

For a list of references please refer to the back of the page



References

1. World Association of Nuclear Operators, *2005 Performance Indicators*, May 2006. **Average values from 1990-2005**
2. Nuclear Energy Institute, *NEI – Safety and Regulation*, viewed 23 August 2006, <<http://www.nei.org/index.asp?catnum=2&catid=353>>. **Unplanned shutdowns for 1980 and 1985 are median values, which are generally lower than the average values**
3. Nuclear Energy Institute, *NEI – Three Mile Island and the Institute of Nuclear Power Operations*, viewed 23 August 2006, <<http://www.nei.org/index.asp?catnum=2&catid=57>>.
4. Nuclear Regulatory Commission, *Probabilistic Risk Assessment Fact Sheet*, viewed 8 August 2006, <<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/probabilistic-risk-asses.html>>.
5. Nuclear Regulatory Commission, *Fact Sheet on Tritium, Radiation Protection Limits, and Drinking Water Standards*, viewed 23 August, 2006, <<http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/tritium-radiation-fs.html>>.
6. Nuclear Energy Institute News Release, *Nuclear Energy Industry Unveils New Policy to Manage Inadvertent Radiological Releases*, viewed 23 August 2006, <<http://www.nei.org/index.asp?catnum=4&catid=934>>.

About North American Young Generation in Nuclear (NA-YGN)

YOUNG PROFESSIONALS

NA-YGN's members are individuals age 35 and under working throughout the fields of nuclear science and technology.

BELIEVE

NA-YGN's members share a personal conviction that nuclear science and technology make important and valuable contributions to our society and will continue to do so in the future.

WORKING TOGETHER

NA-YGN brings together the different sectors of nuclear science and technology to speak with a united voice for a common goal, and to provide professional development opportunities for its members.

SHARE THEIR PASSION

NA-YGN shares its passion for nuclear science and technology by communicating with the public about the many ways in which these technologies impact their daily lives.

ALIVE AND KICKING

Nuclear science and technology is alive and kicking, making tremendous advances in some areas and brimming with possibilities in others.

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