



BACKGROUND

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Radiation Safety (Health Physics) Inspections at Nuclear Power Reactors

Background

The Nuclear Regulatory Commission routinely inspects several aspects of a commercial nuclear power plant's performance. One important area is radiation safety. These inspections evaluate a licensee's efforts to keep radiation exposure to plant employees, the public and the environment below regulatory limits and "as low as reasonably achievable" – also known as ALARA.

Radiation Safety (Health Physics) Inspection Program

Radiation safety performance falls under the Public and Occupational Radiation Safety Cornerstones of the Reactor Oversight Process. A description of the ROP and individual plant performance results are available on the NRC's [website](#). The ROP focuses NRC inspectors' attention on areas with the highest potential impact on public health and safety and occupational radiation safety. Higher risk activities receive more frequent inspections of broader scope than low risk activities. By reviewing radiation safety performance in this risk-informed manner, the NRC remains confident that licensees are providing adequate protection in radioactive material safety.

NRC inspectors are especially busy during refueling outages. Plant workers are at higher risk of exposure during refueling, when systems with contaminated components are being repaired and reactor fuel is being moved. Inspectors evaluate licensee performance in maintaining special equipment that measures and detects radioactivity. They review environmental monitoring programs that track the trace amounts of radioactivity released from power plant sites into the environment.

Inspectors also ensure licensees properly control, handle and protect radioactive materials. Finally, inspectors make sure any shipments of radioactive material are done safely under NRC and U.S. Department of Transportation requirements.



An NRC inspector verifies radiation levels from a radioactive material shipment being prepared for transport.

Radiation Safety (Health Physics) Inspectors



An NRC inspector observes a licensee technician during an environmental monitoring inspection.

Radiation safety inspectors are specially trained and qualified members of the NRC's regional staff. They typically have college education in health physics or engineering, and some are Certified Health Physicists through the American Board of Health Physics. Many have graduate education in health physics as well. All NRC inspectors complete a rigorous qualification process that includes knowledge assessments, practical field training and continuing training requirements.

Updates to Radiation Safety (Health Physics) Inspections

The NRC is constantly improving its inspection processes to enhance safety and use resources effectively. This includes changes to the radiation safety inspection program under the ROP Enhancement Program. Two of these changes are described below; others are described in the [staff's paper](#) to the Commission, dated June 28, 2019.

First, the NRC will change the frequency of inspections in the areas of radioactive effluents and environmental monitoring. Data from [licensee reports](#) and [comparative summaries](#) published by the NRC show that radioactive effluents have either decreased or remained steady, at low levels, across the industry since the ROP began in 1999. Effluent levels across the entire industry are consistently below ALARA guidelines, and environmental monitoring results show nuclear power plant operations have minimal radiological impact on surrounding environs. With these observations, the staff concluded that radioactive effluents and environmental monitoring have very low impact on public health and safety.

Secondly, the NRC is introducing inspection guidance to evaluate licensee performance in meeting radioactive material protection requirements. Inspections following implementation of new security requirements demonstrated that reactor licensees are adequately securing radioactive material. To establish a long-term framework consistent with other areas of power reactor performance oversight, the NRC is implementing focused, risk-informed inspection of radioactive material protection.

The NRC will continue to require annual reports from licensees so the agency can continue to validate industry performance in the important area of radiation safety.



An NRC Inspector verifies dose rates in a steam generator mausoleum at a nuclear power site.

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