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Strengthening Radiation Protection of Workers –Twenty Years of Progress
and the Way Forward**

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3D-CZT Gamma-Ray Spectrometers and Imaging Spectrometers for Source Term Characterization at Nuclear Power Plants

The use of gamma-ray imaging spectrometers at nuclear power plants and other facilities for the purpose of understanding the source term environment has grown sharply in the past 10 years. The primary instrument used at nuclear power plants in the United States is the H-Series unit made by H3D, Inc. The instrument uses 3D-CZT detectors, which are able to provide 1% energy resolution along with isotope-specific gamma-ray imaging in a portable, room-temperature system. The system is used at 75% of nuclear power plants in the United States as well as power plants in Europe and Asia. This paper will discuss the lessons learned over the past decade for these instruments for applications such as optimization and verification of shielding, surveys of incoming and outgoing shipments, characterization of high radiation areas and locked high radiation areas, and site-wide contamination surveys. Additionally, gamma-ray spectrometers based on 3D-CZT can also be used for real-time isotopic trending of source term contained in pipes to improve decision making that will lead to lower source term and dose reduction to workers. Results and lessons learned for these systems deployed at nuclear power plants will be discussed.

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