

RADTRAN

Developed at Sandia National Laboratories, RADTRAN is the national and international standard for radioactive materials transportation risk assessments.

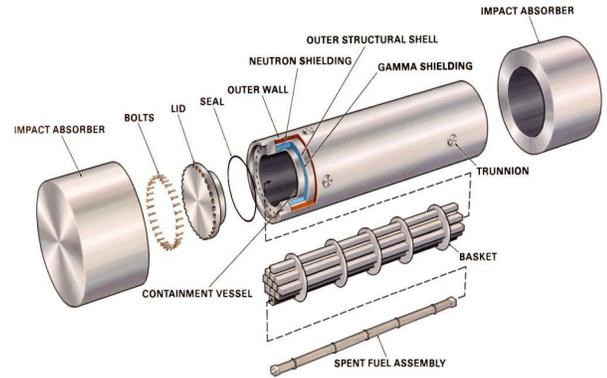
Transportation of Radioactive Materials: A Necessary Risk

Because the safe and secure transportation of radioactive and hazardous materials poses a number of prominent risks to those within the nuclear energy enterprise, the environment, and the public at large, measures must be put into place to assess and manage risks. In order to better model and calculate transportation risk of this nature, Sandia National Laboratories developed RADTRAN, the national and international standard for radioactive materials transportation risk assessments.

RADTRAN: A Unique Code

Sandia developed RADTRAN as a unique environmental impact assessment code for analysis of transportation of radioactive and other hazardous materials. As an internationally validated code, RADTRAN is accepted by the International Atomic Energy Agency. RADTRAN combines user-determined demographic, routing, transportation, packaging, and materials data with meteorological data (partly user-determined) and health physics data to calculate expected radiological consequences of incident-free radioactive materials transportation and associated accident risks.

RADTRAN is a unique program that uses two models to analyze risk associated with the transportation of radioactive



Exploded diagram of a generic used fuel cask

materials. First, it uses a routine model. This model displays the vehicle as a sphere depicting the external radiation dose as a virtual source at the center of the sphere. The second model is an accident scenario developed by Sandia using parts of other risk assessment codes. This model can be used to look at risk and uncertainty associated with events such as standard air pollution, economic modeling, and loss of lead shielding in the absence of a loss of radioactive material.

Using RADTRAN

Originally developed for the U.S. Nuclear Regulatory Commission, RADTRAN has been in use around the globe for 35 years. Publicly available at no cost, RADTRAN has over 600 registered users spanning a variety of occupational sectors including federal employees and contractors, members of state and local governments, and individuals from educational institutions. Approximately 25 percent of registered users are international.



Risk assessment and consequence analysis for radioactive material transportation assures safe shipment

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Although RADTRAN and complimentary programs such as RADCAT are publicly available, Sandia maintains a degree of RADTRAN expertise unlike that developed in other institutions involved in risk assessments and environmental impact studies. As the developing institution, Sandia researchers best-understand RADTRAN, as well as the most appropriate code applications and limitations. With several follow-on code enhancements and adaptations released, Sandia continues to serve as the source of RADTRAN specialization and expertise.



Example of a rail route to be modeled by RADTRAN

Publications

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