Packaging Evaluation Facility

Packaging Research

When transporting radioactive or hazardous materials, safety and security are top priorities. Packaging and transportation regulations require packages to pass rigorous performance tests to ensure that the public and the environment are protected from the hazardous nature of the cargo. The Packaging Evaluation Facility (PEF) develops and evaluates testing solutions—ensuring that they are safe, efficient, and meet regulatory requirements. PEF staff possess the broad range of expertise and equipment needed to support all phases of the development and deployment of safe and secure transportation systems.

Facility Focus

PEF staff are involved in the development and application of standards and tools for regulatory package testing. Staff members have experience evaluating and testing all types of radioactive-material packages, from small drum-like packages weighing less than 500 lb. to casks weighing over 10,000 lb. Additionally, PEF staff provide technical support for shipment preparation, risk assessment, and logistics.

Expertise

Staff members have core capabilities in packaging, testing, and certification assurance; shipment preparation and planning, including regulatory compliance, logistics, and risk assessment; and package certification assurance. PEF staff capabilities also include

- designing customized package testing programs;
- assisting customers in meeting package testing and certification needs for commercial applications, UN Performance Oriented Packages, and radioactive materials packages (IP, Type A, Type B, and Fissile);
- preparing and reviewing Safety Analysis Reports for Packaging;
- interacting with federal certifying officials to obtain required certifications; and
- applying US and international transportation regulations and compliance requirements.

Package free drop and thermal tests per 10 CFR 71

Facility Capabilities

PEF drop-testing facilities comprise

- a large outdoor impact pad for package prototypes or scale models weighing up to 28,000 lb.,
- a smaller indoor impact pad with a 15 ft drop height for units weighing up to 3,000 lb.,
- a precision drop tester for small packages (loads up to 125 lb.), and
- an additional outdoor drop-test pad with a 50,000 lb. capacity available at the ORNL main campus.

PEF's other equipment and capabilities for evaluating packages and simulating possible transportation circumstances include

- a Lansmont Model 10000-10 Touch Test Vibration System (1 to 500 Hz vibration table with a 5 ton capacity) for simulation of vibration forces during transportation,
- a Lansmont Model 152-30K Compression Tester (15 ton compressive force) for compression/stacking tests,
- steel punches designed to regulatory specifications for puncture testing,
- a 72-channel thermal monitor data acquisition system,
- diagnostic measuring devices traceable to the National Institute of Standards and Technology,
- crush testing by dropping a 1100 lb weight from 30 ft onto a package, and
- high-speed cameras at 1,000 frames per second.

Partnerships and Collaborations

PEF staff assist and collaborate with many federal and industry customers. Current and recent collaborations included ones with the National Nuclear Security Administration, Department of Energy, Y-12 National Security Complex, AREVA, Savannah River National Laboratory, Nuclear Regulatory Commission, and Department of Transportation.

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