Spent Fuel Transport Risk Assessment (SFTRA)

The NRC staff has, over the years, conducted studies of the impacts and risks from transportation of spent nuclear fuel (SNF). The NRC staff documented each of these studies in following:

- A Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes, NUREG-0170, December 1977;
- A Shipping Container Response to Severe Highway and Railway Accident Conditions, NUREG/CR-4829, February 1987; and in
- A Reexamination of Spent Fuel Shipment Risks, NUREG/CR-6672, March 2000.

These studies found that SNF shipment risks are low.

While the NRC staff has confidence in these results, it initiated the SFTRA project to obtain an updated and refined assessment of the spent fuel shipment risks that considers new or additional factors and to obtain explanatory materials to enhance the NRC's related outreach efforts on public health and safety. With regard to new factors, unlike previous assessments, certified (as opposed to representative) package designs are employed in the SFTRA analysis. The assessment was performed primarily by computer analysis, and in part includes the following additional new analyses:

- Analysis of high-fidelity models of 2 rail cask designs (one with and one without an inner spent fuel canister) and 1 truck cask design (without an inner spent fuel canister), their respective impact limiters, and their respective (fuel) contents;
- 3-D thermal analysis of cask and fuel assemblies to improve predictions of spent fuel cask behavior during accidents involving fire.
- Calculation of spent fuel shipment risks (dose estimates and probabilities) under routine and accident conditions using updated transportation accident statistics and an updated transport risk assessment code.

SFTRA is a NRC staff-initiated, generic risk assessment, not mandated by any external commitment. Once completed, SFTRA will be used to reconfirm that the NRC's transportation safety regulations in 10 CFR Part 71 provide adequate protection of public health and safety during the transportation of spent nuclear fuel, and that there is no need to change these regulations to improve safety. The assessment has been informed by results of relevant security assessments, but does not evaluate security-related transportation scenarios or impacts.

As of August 2013, the NRC staff has: (1) updated the analysis of spent fuel transport risk estimates (supported by Sandia National Laboratories) as described above; (2) prepared a draft NUREG report (Draft NUREG-2125) documenting the analysis; (3) conducted an external technical peer review (performed by Oak Ridge National Laboratory); (5) issued the draft NUREG for public comment; (6) had ACRS subcommittee and full committee reviews; (7) dispositioned comments from the public, peer review and ACRS reviews; (8) and performed a

Phenomenon Identification and Ranking Table (PIRT) analysis. The NRC staff plans to complete the project and issue a final NUREG report, currently in preparation, by the end of calendar year 2013.