

## **Additional Impact and Fire Tests**

Using Commission guidance provided in the SRM dated August 30, 2002, and the public comments received, the staff has identified four alternative tests that could be conducted in various combinations as part of the PPS, as described below. All of the tests described below include cask testing with impact limiters. Tests 3 and 4 also include the conveyances.

### **1. A test of a rail cask to the regulatory limits (Reg Rail)**

This is a test of a full-scale rail cask addressing the test specifications in 10 CFR 71.73. The first three elements must be applied to the same cask before the acceptance criteria are applied:

- A 9-meter free drop of the cask onto an essentially unyielding surface in the orientation for which maximum damage is expected (71.73)
- A 1-meter free drop of the cask onto a mild steel bar, 15 cm in diameter and at least 20 cm long, mounted vertically on an essentially unyielding surface in the orientation for which maximum damage is expected (71.73)
- Exposure to a 30-minute, optically dense, fully-engulfing, hydrocarbon fire, that extends from 1 to 3 meters beyond the cask, which is mounted 1 meter above the surface of the fuel source (71.73)
- A shallow immersion test of an undamaged cask under a head of water of at least 15 meters (71.73)

A potential additional element for this test is:

- A 2-Mpa (200-meter) submersion test of a separate undamaged cask under a head of water of at least 2 Mpa. (This element responds to public commentators' concerns about barge shipments across Lake Michigan.)

### **2. A test of a truck cask to the regulatory limits (Reg Truck)**

This is a test of a full-scale truck cask addressing the regulatory criteria in 10 CFR Part 71. The specifications for this test are the same as for Test 1; however, if the Reg Truck test is done in combination with the Reg Rail test, the 200-meter submersion test may be omitted.

### **3. A demonstration rail cask test (Demo Rail)**

This is a test of a full-scale rail cask on its actual conveyance under realistic accident conditions. For this test, the staff envisions a collision of a rail cask with a simulated bridge abutment at about 75 mph followed by a fire from a ruptured tank car.

### **4. A demonstration truck cask test (Demo Truck)**

This is a test of a full-scale truck cask on its actual conveyance under realistic accident conditions. For this test, the staff envisions a collision of a truck cask with a locomotive traveling at about 75 mph on a grade crossing followed by a fire.

Attachment 2 presents the estimated costs for these tests. The table in Attachment 2 includes two columns for the Reg Truck test. The first is the cost estimate for the Reg Truck test as a standalone test, and the second is for the Reg Truck test in combination with the Reg Rail test. The principal difference between the standalone and combination costs is that the \$7.6M test facility has already been built for the Reg Rail test.