From: Earl Easton
To: Amy Snyder
Date: 5/30/03 4:19PM
Subject: MY Comments on PPS Test Protocols

CC: E. William Brach; M. Wayne Hodges; Robert Lewis

RECEIVED
2003 JUN 23 AM 11: 34
Rules and Directives
Branch
USNRC

2/21/03
68FR 8530
(231)

E-RIDS=ADM-03
Call=A.Snyder (AMS3)
A.J. Murphy (AJM1)

Template=ADM-013

Comments on the Package Performance Study Test Protocols

Based on my analysis of public comments, conversations with NRC staff who review transportation package designs, and personal experience, I believe that we should consider revamping the proposed physical testing protocols in the PPS. The main objectives of the physical testing for the PPS should be clarified as:

1. Validating the use of and enhancing public confidence in scale model tests as a basis for NRC Certifications;
2. Validating the use of and enhancing public confidence in the use of computer modeling as a basis for NRC Certifications and risk studies; and
3. Enhancing public confidence in the adequacy of current transportation regulations.

I believe the current test protocols are not designed to achieve these objectives in a clear, straight-forward manner, that would be easily understood and accepted by the public. This is evidenced by the continuing debate at public meetings over what the real purpose of the PPS tests should be (i.e., public confidence or computer code validation), and the repeated questioning by the "public" of what exactly is that "public confidence" that the NRC is trying to achieve.

The above three objectives have become increasing important in light of the latest round of public meetings. The first two deal directly with how the NRC reviews and approves spent fuel packages. All of our spent fuel packages are based on scale model testing and computer modeling. Indeed, the public and members of Congress have now questioned whether this is adequate, absent full-scale testing. If public confidence in the way we analyze and approve spent fuel casks falters, the legitimacy of all our current spent fuel cask approvals becomes suspect.

The other reoccurring public confidence issue is whether current regulations are adequate to protect against severe accidents that might happen near their backyards. Here the public is apprehensive about how a 30-mile an hour drop onto that mysterious "unyielding surface" is going to protect them from that truck wreck they witnessed or saw on TV last night. Why not 70 or 100 miles per hour on a hard concrete surface? It begs the question: are average citizens ever going to be convinced that an unyielding surface represents anything real, when we, as technical people, often have a hard time explaining it? Bottom line - weren't the DOE videos of the train crashing into a cask, however flawed, much more effective in assuring the public, than any drop test onto an unyielding surface? The British realized this in 1985 with Operation Smash Hit. Having heightened public awareness and raised expectations in these areas through public meetings, I believe it is time to revamp the PPS test protocols to address these concerns.

I think one of the most efficient and effective ways to re-direct the PPS towards achieving the above objectives is to follow the precedent set by the British Central Electricity Generating Board's in its test program for the Magnox spent fuel shipping cask. The program consisted of computer modeling and impact testing of a quarter, half, and full scale cask model. The damage predicted for each scale model (quarter, half and full) was determined using finite element computer analysis (DYNA-3D and ANSYS) and compared to actual impact test results. The same full scale model was subsequently subjected to a simulated rail crash. The test protocol was able to show a clear and direct relationship between scale modeling, computer analysis, full scale drop testing on an unyielding surface and damage from a realistically severe accident. The simulated rail crash (100 mph into the cask) demonstrated in a rather dramatic public setting that the damage from a very severe accident can be less severe than the regulatory 30 foot drop test on an unyielding surface. From these tests, the BCEGB (and the public?) was able to conclude:

1. The use of scale models can be justified for estimating the impact performance of Magnox (substitute spent fuel) casks;
2. Mathematical models are an essential adjunct to developing a proper understanding of cask impact behavior. Properly validated models can be used in a predictive manner with a high degree of confidence.
3. The IAEA Regulatory 9 meter drop test appears to cover those severe accidents which can be foreseen on the U.K transport system.

I believe a similar type testing program would allow us to make similar assertions and make a strong case for public confidence in both our regulations and evaluation methods.

In summary, the benefits from such a test program would be:

1. Demonstration of a clear relationship between computer modeling, scale model testing, the regulatory 30 foot drop test, and severe accidents;
2. Validation and enhanced public confidence in scale model tests as a basis for NRC Certifications;
3. Validation and enhanced public confidence in the use of computer modeling as a basis for NRC Certifications and risk studies;
4. Dramatic video of a simulated severe accident ;
5. Validation and enhanced public confidence in the adequacy of current transportation regulations (i.e., from a comparison of 30-foot drop onto an unyielding surface and simulated accident.);
6. The full scale testing of an actual cask certified by the NRC (if one were chosen for the actual test.) This would allow a direct comparison between the full scale test, a simulated accident test, a predictive computer calculation, and the bounding calculation done by an applicant for certification;
7. Strength in numbers in that we verified the conclusions of the British tests.

I also believe that if it comes to a matter of funds available that it would be preferable to do a serious of tests for either a rail or truck cask, rather than doing a less informative test on both a rail and truck cask.

Earl. P. Easton