

From: Bernard White  
To: Robert Shewmaker  
Date: 2/13/03 2:37PM  
Subject: Re: TRIP BULLETS

Bob,

Have you gotten any more information about SNLs modeling of the bolt region. We are going to start wrapping this effort (HI-STORM) up soon.

Bernie

>>> Robert Shewmaker 02/04/03 11:28AM >>>

1. The tables that SNL is assembling for the next draft of the report are an excellent way to get a good summary of the analyses that have been performed as well as the results and how the results from one feed as input to another.

Ex 2  
2. Based on the still unresolved issue of cask to cask impact at an angle and the apparent preliminary of the overpack lid on the HI-STORM 100, Mahendra and I had a phone call with Jeff Smith and Ken Gwinn yesterday. I am concerned that the modelling in this zone is not sufficiently detailed to give us good information on the behavior of the overpack closure integrity under the impact conditions. The stud bolts are represented as a single beam element and the boundary conditions with the other contacts that are used in the model are not yet understood by me. These surfaces include the double lid top plates, each 2" thick, the threaded connection to the anchor block, and the bearing of the nut on the top lid plate. We questioned what other bolt stress components had been reviewed in the results such as the shear in the stud bolts since the graphics we saw at SNL appeared to show the stud bolt tensions as axial tensions and not the maximum tension that may occur in some other direction as a result of combined stresses. We then asked to know what the maximum radial shear stresses were in the stud bolt and what we found out that they cannot extract that stress from their analyses. Apparently in the setup of the calculation for a given loading scenario, they pre-identify the specific output parameters they want to obtain and they did not identify the shear stress as an output parameter. Such a reanalysis to obtain these values will require a computer run time equal to the original analysis. Instead of requesting that such a run be performed, we have asked that we receive a detailed diagram of the model being analyzed at the overpack body cylindrical sidewall, the overpack lid and the lid stud bolt. We will also want to know what parameters SNL has predefined in the analysis as those they wish to study. We put forth a suggestion of a more detailed model of the localized area using the global conditions from a previous analysis to define boundary conditions and to describe the loading conditions, but that was viewed as something that might be done later.

Our next step is to see the details used in the current model. This should not impede their work on the other cask systems for aircraft and other events, but we should note that the response of the HI-STORM 100 to the above event is not yet fully resolved.

3. SNL, in having to develop the models and understand the different storage cask systems being reviewed has, realized that these are very different systems and many of the various details such as clearance space etc. may be important parameters in defining the cask behavior under the conditions arising from the events we are assessing.

4. SNL modeling of reinforced and concrete unconfined between steel inner and outer shells still appears to be a bit of the "black box" approach for the VSC-24. This is even though they believe they have the correct material properties based on their "tuning" of the concrete model based on the previous tests relative to the impact of the concrete slab with the fighter jet engine. I believe we need to go thru their logic on this area.

5. The approach for the NUHOMS aircraft event needs to be understood once they have their approach outlined from the various concepts and implications/considerations that were discussed during the

Portion Ex 2

Elg

meetings.

2/4/03

**CC:** Jack Guttman; Mahendra Shah