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Subject: RAM Package Vulnerability Study weekly email report

RAM Package Vulnerability Study

Weekly Report for the Week Ending 2/21/03

Submitted by Jeremy Sprung

Jetliner Impact Draft Report. Writing of new subsections and revision of old subsections of Sections 2 and 3 of the report continued.

Global Jetliner Impact Calculations. Development of CTH models for the NUMOMS, TN-68, and VSC-24 casks continued. Quick-look 2D axisymmetric global jetliner impact calculations of the NUHOMS cask. These calculations will be redone, adding in the vertical wall supports to stiffen the structure. The 3D calculation of jetliner impact against the NUHOMS cask was restarted from approximately 50 msec into the impact event, which is about one-quarter of the way through the full event. A more detailed model of NUHOMS canister is being built to support global jetliner impact and calculations.

Ex 2

Excel spreadsheet calculations were performed that used conservation of momentum to determine the final velocity of the jetliner plus four or eight HI-STORM casks assuming that the soft wing and fuselage structures of the jetliner sweep up the casks and that after the initial impact the ensemble of the casks plus the jetliner moves as a single unit.

Jetliner Component Impact Calculations. The PRONTO calculation that examined an end impact of the HI-STORM cask canister onto a rigid surface using a finer mesh discretization to increase the resolution of the strain field that develops in the canister weld region was repeated adding a cylindrical rigid surface that represented the inner shell of the cask overpack. The results of this calculation were compared to those from the calculation that lacked the confining rigid cylindrical surface. Both calculations predict that the

Ex 2

A Presto calculation was performed that simulated the rigid body motion of the HI-STORM storage cask when the cask was loaded by a CTH derived Riera curve for the global impact of a jetliner onto the cask. A HI-STORM cask finite element model for JAS3D was constructed in order to calculate the force required to indent the side of the storage canister. This force-displacement information will be used to calculate the energy required to cause the canister to slide out from the indented cask overpack, if the cask overpack stops suddenly by colliding with another cask, a storage pad, or the ground. A calculation that uses this model has been submitted and is running; how well it converges has yet to be determined. Modeling using PRONTO of the impact of a jetliner engine onto the HI-STORM cask continued.

Small Plane Survey. No work done this week.

Ex 2 portions

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