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Date: 1/20/03 5:58PM  
Subject: RAM Package Vulnerability Study weekly email report

RAM Package Vulnerability Study

Weekly Report for the Week Ending 1/16/03

Submitted by Jeremy Sprung

Jetliner Impact Draft Report. Revision of Section 2 on jetliner impact and Section 3 on jet fuel pool fires in response to NRC comments continued. The new jetliner CTH calculations that were performed at [redacted] were written up. This writeup will be added to Section 2 of the Jetliner impact report

Ex 2

Global Jetliner Impact Calculations. SAR data for the TN-68, VSC-32, and NUHOMS casks was reviewed preparatory to developing models of these casks for use in the CTH global jetliner cask crash calculations. Work on the Zapotec benchmarking calculation of the ETR drawbar cask air blast test continued.

Plots of cask velocity as a function of time and cask velocity as a function of cask-to-cask separation distances were constructed using the results of the CTH analysis of the jetliner impacting the [redacted]. The velocity for this case is lower than that for direct impact on the [redacted]. Since jetliner impact is more likely [redacted] of the cask, these velocities may be more representative actual cask exit velocities during jetliner attack sabotage scenarios.

Ex 2

Jetliner Components Impact Calculations. The following two PRONTO calculations were completed: a [redacted] cask on cask impact at [redacted] and an impact of the landing gear strut onto the [redacted] of the HI-STORM cask at an attack angle of [redacted]. Several additional runs have been initiated which include the MPC contents to assess secondary damage to the contents. These analyses are ongoing.

Ex 2

An analysis of the HI-STORM cask canister with its internal represented by a homogeneous lumped mass was performed that examined an impact onto a rigid surface at [redacted] in the [redacted].

Ex 2

Using impact test data from the J79 jet fighter engine tests scaled by the ratio of the mass of a [redacted] jetliner engine to the mass of the J79 engine, a Riera loading function curve (force vs. time data) was developed for use in calculations that examine the impact of a [redacted] engine onto a spent fuel transport or storage cask. This Riera curve was then used in a finite element analysis that simulated a [redacted] engine impact on the NAC UMS cask. The cask body was unconstrained (floating in space) and the force from the Riera curve was applied as a time varying pressure over a 28.8 in<sup>2</sup> area at the center of the cask body. Using the force vs. time history from the Riera curve, a hand calculation (spreadsheet) was done to determine the translational and rotational displacement of a HI-STORM over-pack, struck at the [redacted] engine.

Ex 2

Small Plane Survey. As requested by NRC, a spreadsheet containing the distribution of commercial aircraft operating in the United States, was

Portions Ex 2

E/87