

6/18/02

**Ten task categories identified to assess the vulnerabilities and resultant source terms of storage and transportation packages:**

- ① Terrorist events and source term analyses from aircraft crashes,**
- ② Weapons and resulting source term analyses,**
- ③ Truck and rail cask model development,**
- ④ Storage cask model development,**
- ⑤ Threat assessments for storage,**
- ⑥ Threat assessments for transportation of SNF,**
- ⑦ Non-SNF Model Development,**
- ⑧ Threat assessments for Non-SNF transport packages,**
- ⑨ Vulnerability assessment technical assistance.**
- ⑩ Guidance document development for Source Term evaluation.**

Information in this record was deleted  
in accordance with the Freedom of Information  
Act, exemptions 2  
FOIA b7C - DISY

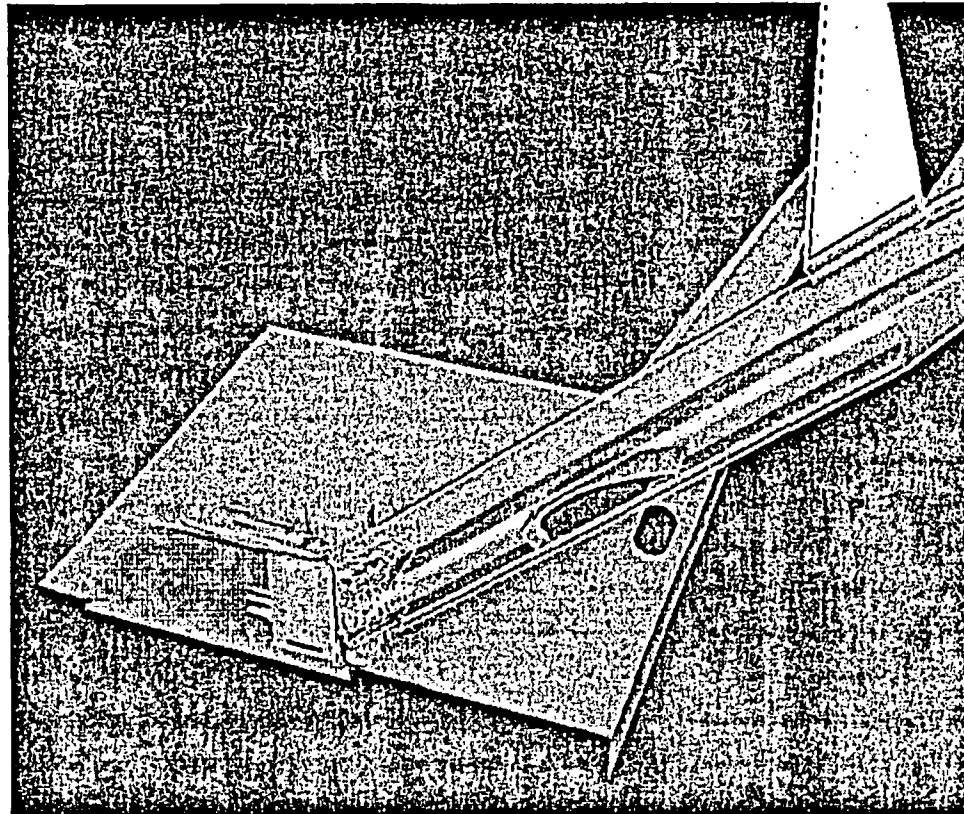
H/B

## Accomplishments/Activities

- **Initiated work on structural analysis of a plane crash into an array of storage casks (Task 1).**
- **Initiated work on thermal analysis of a plane crash into an array of storage casks (Task 1).**
- **Initiated work on developing a method to qualitatively assess source terms resulting from a terrorist event (Task 2).**
- **Initiated work to develop a table of weapons versus consequences based on existing work.**
- **Response to Rev. 1 of 189 received week of May 13, 2002.**

Ex2

(~~██████~~) Plane Crash Onto ISFSI Undergoing  
Ongoing Shakedown Evaluation



Portion Ex2

## Issues/Future

- ✘ Amount of work coupled with schedule is extremely challenging.
- ✘ Will use NISAC resources to conduct work.
- ✘ Complete scope of effort will not be known until we get results from preliminary analyses (e.g., degree of damage from impact/fire will dictate source term analyses).
- ✘ Contract goes through FY04 and addresses events applied to specific SNF and non-SNF packages.

## INTERACTIONS WITH RES

**Close interaction between RES and SFPO on:**

- a. Plane model development**
- b. Plane engine impact assessment**
- c. Analytic lessons learned**
- d. Assure NO duplication of effort**
- e. Complement available resources**

**INTERACTIONS WITH NRR**

**INTERACTION WITH NSIR**

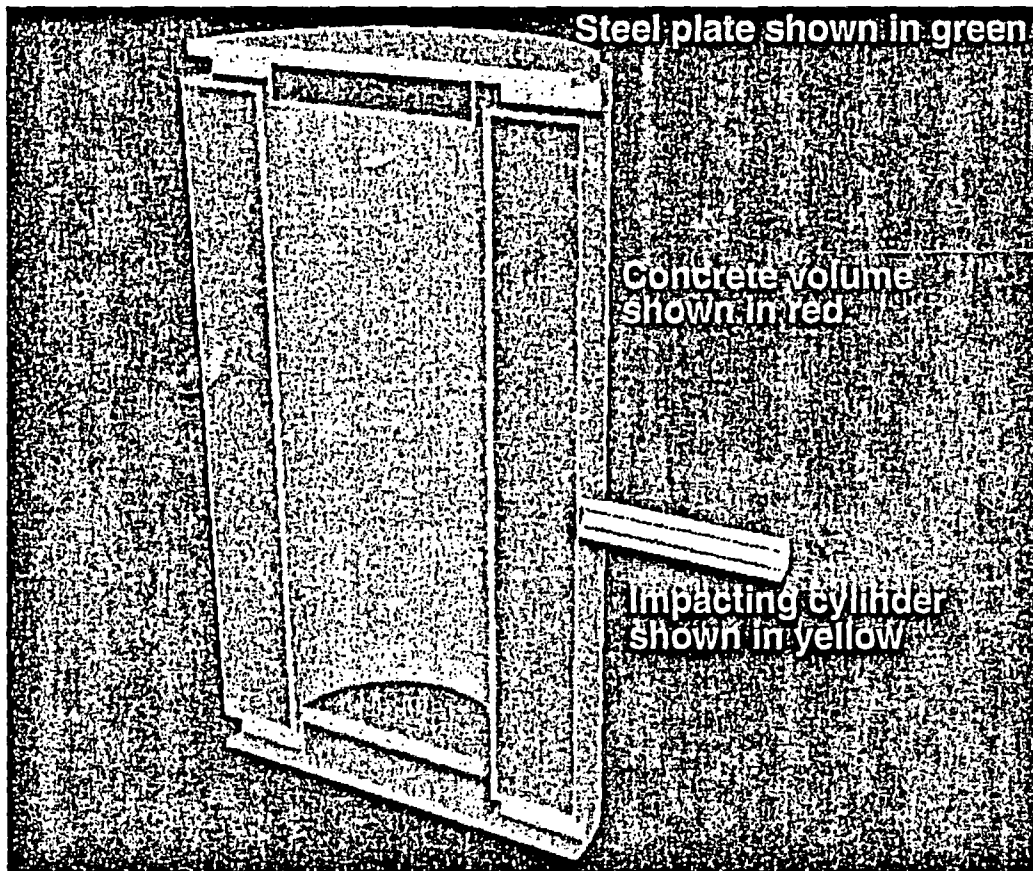
## Ongoing Activities

- a. Expert Panel Meetings to develop Methods for Calculating Source Terms Under Terrorist Events
- b. Transportation Cask Model Development
- c. Storage Cask Model Development
- d. Initiated Analysis on the HI-STAR Dual Purpose Cask to Assess Analytic Methods and Identify Technical Needs
- e.

Ex2  
Cylinder Impact into storage cask  
mph at centerline



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Karagosian-Case concrete model used for concrete

Steel used 70 ksi yield

Symmetry boundary used at cut plane to model missing material

5 msec of analysis time shown

330,000 elements total in model

Portion Ex2

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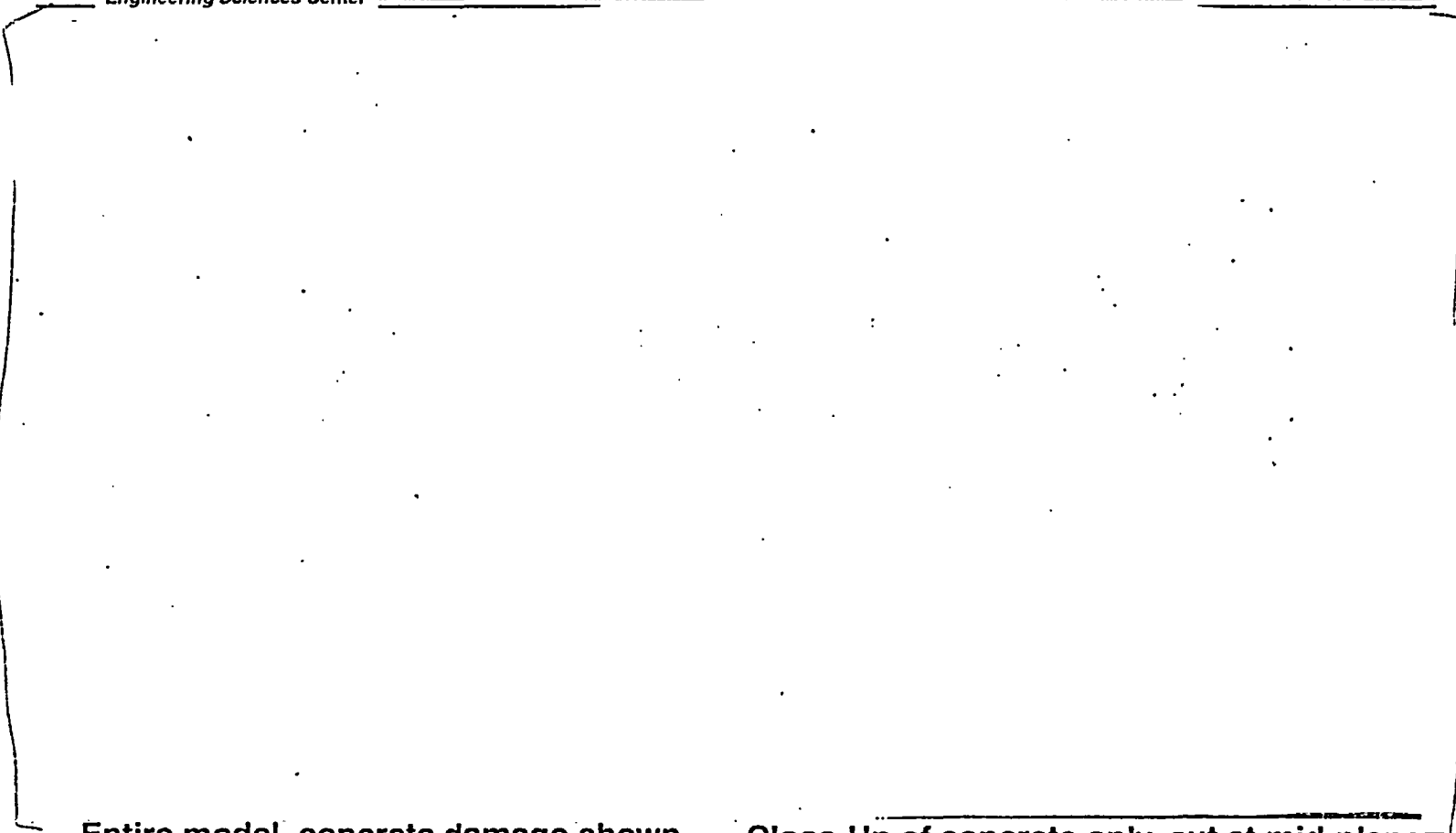


# Results at 5 msec of analysis time Concrete Cells



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Laboratories

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Entire model, concrete damage shown

Close-Up of concrete only, cut at mid-plane

**Preliminary results show widespread damage to concrete - primarily in contacted zone, but also in neighboring cells of the cask.**

*Robert Ex 2*

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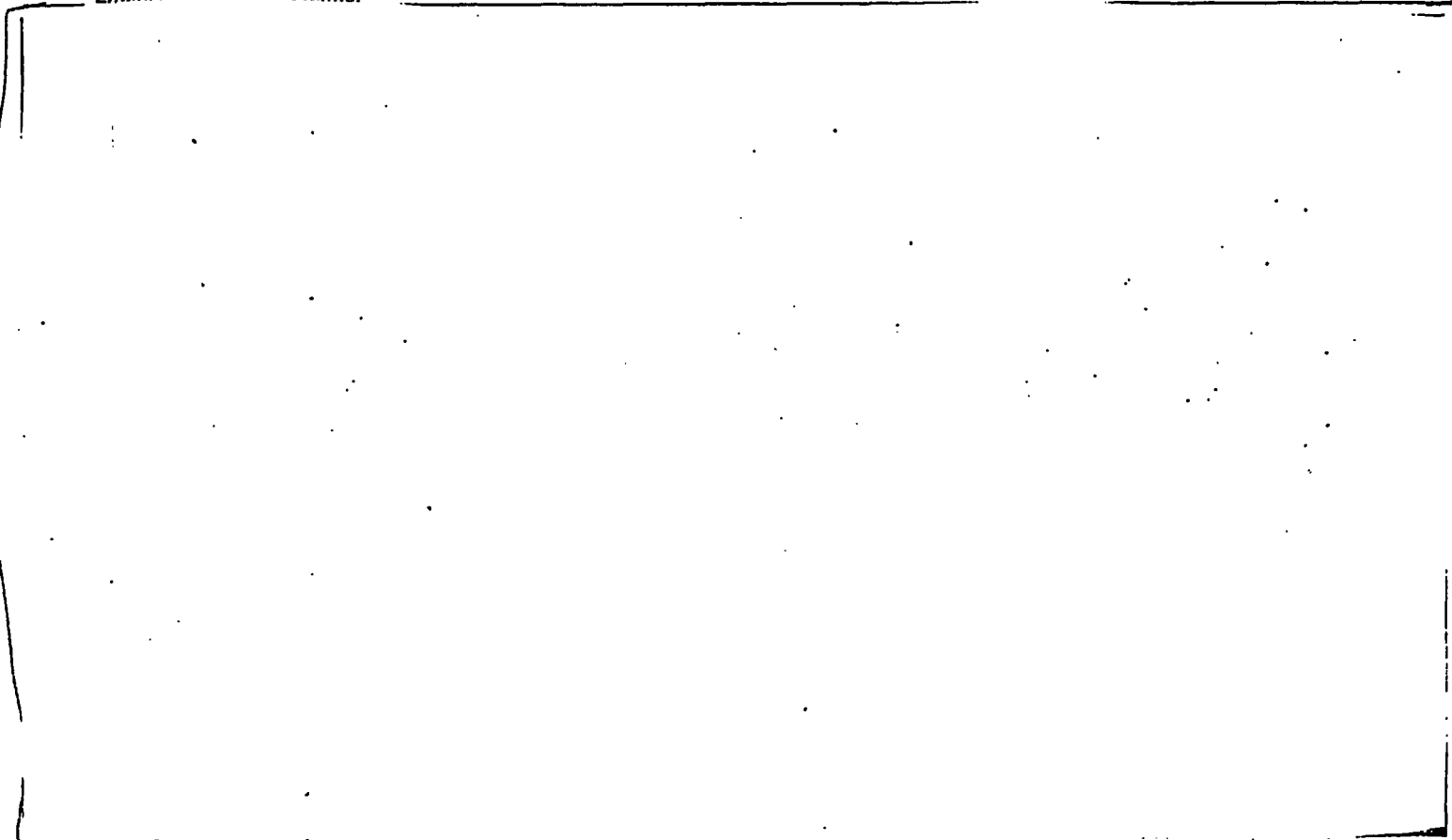
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# Results at 5 msec, continued Steel Liner



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Ex2

2" dia  
steel yield  
strength

Ex2

**Steel Liner: Tearing in steel liner is expected only at the contact zone with the impactor - confinement of the rubble concrete is likely.**

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# Future Plans



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**Finalize definition of impactor,  
Include additional momentum of structure,  
Consider additional impact orientations.**

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