

Professional Issues Tutorial: Columbia

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The space shuttle *Columbia* launched on 16 January 2003. About 82 seconds after launch a a suitcase-size piece of foam insulation broke off and hit the left wing. The slide below is from a presentation at Boeing on 23 January, to determine whether it would be safe to land the shuttle; the question is whether the Spray-On Foam Insulation (SOFI) had damaged the tiles or the Reinforced Carbon-Carbon (RCC) panels below them. Boeing and NASA concluded that the damage was not dangerous, and did not even arrange for high-resolution spy cameras to photograph the damage as requested by some Boeing engineers. The shuttle burned up on re-entry on 1 February, killing all seven crew members.

Comment on the style of presentation, listing good and bad points.

Name _____

Order of Analysis

- **Orbiter assessment of ascent debris damage includes**
 - **Evaluation of potential for debris to damage tile and RCC**
 - ◆ **Program “Crater” is official evaluation tool**
 - Available test data for SOFI on tile was reviewed
 - No SOFI on RCC test data available
 - ◆ **Even for worst case, SIP and densified tile layer will remain when SOFI is impactor**
 - **Thermal analysis of areas with damaged tiles**
 - ◆ **Thermal analysis will predict potential tile erosion and temperatures on structure**
 - **Structural assessment based on thermal environment defined above**
 - ◆ **Basis is previous Micrometeoroid and Orbital Debris (M/OD) study performed in 1996**