Sent: Wednesday, October 13, 2004 4:33 PM
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Subject: Preliminary Survivability Number for EO-1

Joe,

I made the changes to the reentry survivability analysis that we discussed, namely:

1 Synthetic materials approach omitted (had been applied incorrectly AND used the wrong equation)
2 Dimensions have been re-ordered to represent the correct rotation axis 3 Parent mass has been increased to represent the correct trajectory 4 Solar array has been omitted per JSC instruction 5 Propellant tank is modeled as a sphere 6 Only DAS 1.5.3 (web interface version) is used

The end result of all that was to increase the debris casualty area from 3.145m2 to 5.9m2 (including the mirrors), still well under the 8m2 guideline. For a reentry from your inclination with population projected out to 2035 this is equivalent to approximately 1 in 13,750 odds of causing significant injury to one person - meeting the 1 in 10,000 international standard.

I will review my work tomorrow with a fresh set of eyes, but I think this answer will stand. I am glad that I updated this analysis, if only for academic reasons. One aspect of the work which is still somewhat concerning is that only about 57% of the spacecraft mass has been analyzed, compared to the current standard of 90-95%. To fill this gap would take considerably more effort, and would probably not be worthwhile as the bulk of what remains is probably aluminum and would demise readily.

Scott Hull

PS: If Seth needs to see this please forward it to him, as I have neither his e-mail address nor his last name.