STS-113 ORBITER POST LANDING INSPECTION
DEBRIS ASSESSMENT
9 December 2002

After the 2:38 PM local/eastern time landing on 09 December 2002, a post landing inspection of OV-105 Endeavour was conducted at the Kennedy Space Center on SLF runway 33 and in Orbiter Processing Facility bay 2. This inspection was performed to identify debris impact damage and, if possible, debris sources.

The Orbiter TPS sustained a total of 113 hits of which 29 had a major dimension of 1-inch or larger. This total does not include the numerous hits on the base heat shields attributed to SSME vibration/acoustics and exhaust plume recirculation.

The following table lists the STS-113 Orbiter damage hits by area:

	HITS > 1-inch	TOTAL HITS
Lower Surface	14	68
Upper Surface	2	5
Window Area	13	38
Right Side	0	0
Left Side	0	2
Right OMS Pod	0	0
Left OMS Pod	0	0
TOTALS	29	113

The Orbiter lower surface sustained 68 total hits, of which 14 had a major dimension of 1-inch or larger, both numbers are well within family. The majority of the hits were in the area from the nose landing gear to the main landing gear wheel wells. This area sustained 43 hits with 6 greater than 1-inch. Most of the hits in this area are shallow, indicative of damage from External Tank foam.

The largest lower surface tile damage site, located on the RH inboard elevon, measured 7-inches long by 1-inch wide by 1/2-inch deep. This damage spanned two tiles. The cause of this damage has not been determined yet.

The landing gear tires were in good condition.

ET/Orbiter separation devices EO-1, EO-2, and EO-3 functioned normally. No ordnance fragments were found on the runway beneath the umbilicals. The EO-2 and EO-3 fitting retainer springs appeared to be in nominal configuration. The EO-2/3 pyro debris shutters were fully closed. No other debris was found beneath the umbilicals.

Typical amount of tile damage occurred on the base heat shield. SSME Dome Heat Shield closeout blankets on SSME #1 and #3 were in good condition. The closeout blanket on SSME #2 was damaged/frayed from the 12 o'clock to 3 o'clock position. A portion of the OML fabric was missing.

There were a total of 38 hits, with 13 having one dimension greater than 1-inch, on the window perimeter tiles. Hazing and streaking of forward-facing Orbiter windows appears to be normal.

The post-landing walkdown of Runway 33 was performed immediately after landing. All components of the drag chute were recovered and appeared to have functioned normally. An 8-inch long piece of Ames Gap Filler material was found on the runway.

In summary, the total number of Orbiter TPS debris hits and the number of hits 1-inch or larger were within established family. However, the number of hits between the nose landing gear and main landing gear wheel wells is slightly higher than normal. The potential identification of debris damage sources for mission STS-113 will be based on the laboratory analysis of Orbiter post landing microchemical samples, inspection of the recovered SRB components, film analysis, and aerodynamic debris particle trajectory analysis. The results of these analyses will be documented in the STS-113 Debris/Ice/TPS Assessment and Integrated Photographic Analysis report.

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