STS-112 ORBITER POST LANDING INSPECTION
DEBRIS ASSESSMENT
21 October 2002

After the 11:44 am local/eastern time landing on 18 October 2002, a post landing inspection of OV-104 Atlantis was conducted at the Kennedy Space Center on SLF runway 33 and in Orbiter Processing Facility bay 1. This inspection was performed to identify debris impact damage and, if possible, debris sources.

The Orbiter TPS sustained a total of 107 hits of which 25 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-112 Orbiter damage hits by area:

	HITS > 1-inch	TOTAL HITS
Lower Surface	22	81
Upper Surface	0	0
Window Area	3	22
Right Side	0	1
Left Side	0	0
Right OMS Pod	0	0
Left OMS Pod	0	3
TOTALS	25	107

The Orbiter lower surface sustained 81 total hits, of which 22 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 46 hits with 15 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 just right of centerline in between main landing gear wheel wells, measured 4-1/2 inches long by 1/2-inches wide by 1/4-inches deep. The cause of this damage was most likely ice/frost from the ET LO2 feedline bellows or support brackets.

There was an Ames Gap Filler material protruding from in between two tiles just forward of the RH MLG door.

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. All SSME Dome Heat Shield closeout blankets were in good condition.

There were a total of 22 hits, with 3 having one dimension greater than 1-inch, on the window perimeter tiles. Hazing and streaking of forward-facing Orbiter windows appears to be lighter than 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.

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-112 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-112 Debris/Ice/TPS Assessment and Integrated Photographic Analysis report.

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