

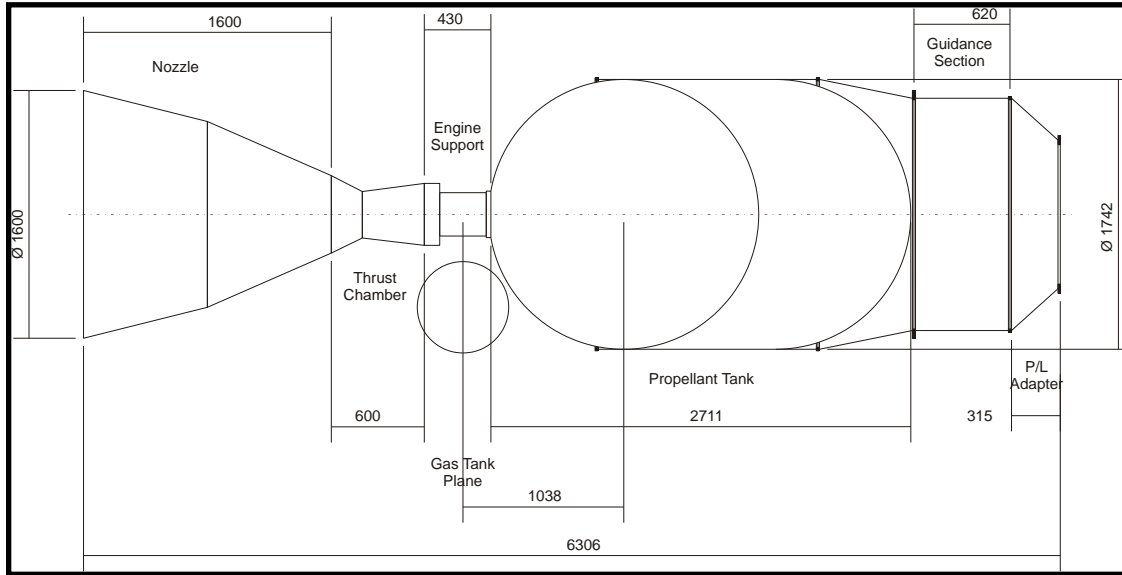
IAASS Test Cases

**ATD3 Working group meeting - Test case ideas discussion
(March 8, 2022)**

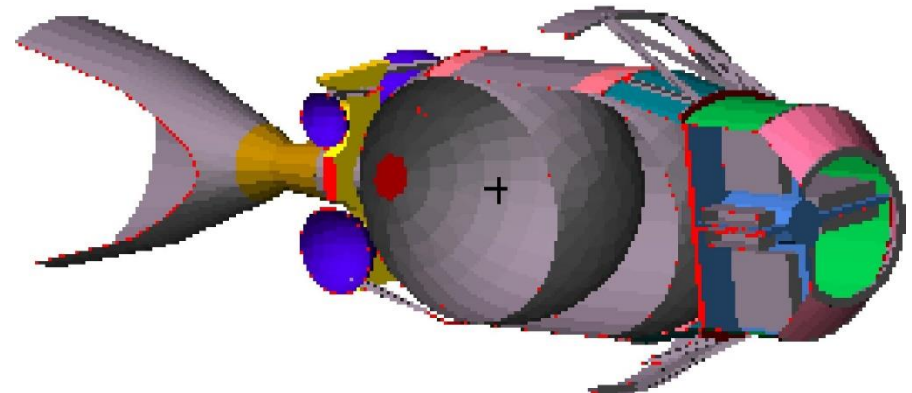
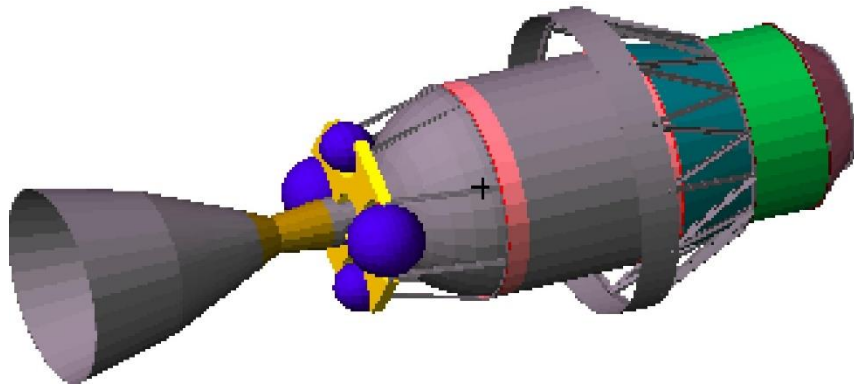
T. Lips

- In 2012, the IAASS (International Association for the Advancement of Space Safety), through its Technical Committee for Launch and Re-entry Safety, defined two test cases for the **comparison/benchmarking of destructive re-entry simulation tools**.
- The first one is a numerical rebuild of a historic **DELTA-II Second Stage** re-entry in which occurred on January 22, 1997, creating several surviving ground fragments recovered on US territory.
- The second one is an artificial, **generic satellite model (GENSAT)** developed by HTG and NASA in the course of SCARAB/ORSAT comparisons.
- Especially the DELTA test case could be interesting for ATD-3, as it has been already analyzed by a wide range of tools (see paper).

DELTA-II Second Stage



Subsystem	Material	Mass
		kg
Engine	Inconel, AA7075, CFRP	198
Gas Tanks	TiAl6V4	81.2
GuideSec	AA7075	165
PLAdapter	AA7075	20
PropTank	A316	267
Structure	AA7075	193
		924.2



DELTA-II Second Stage

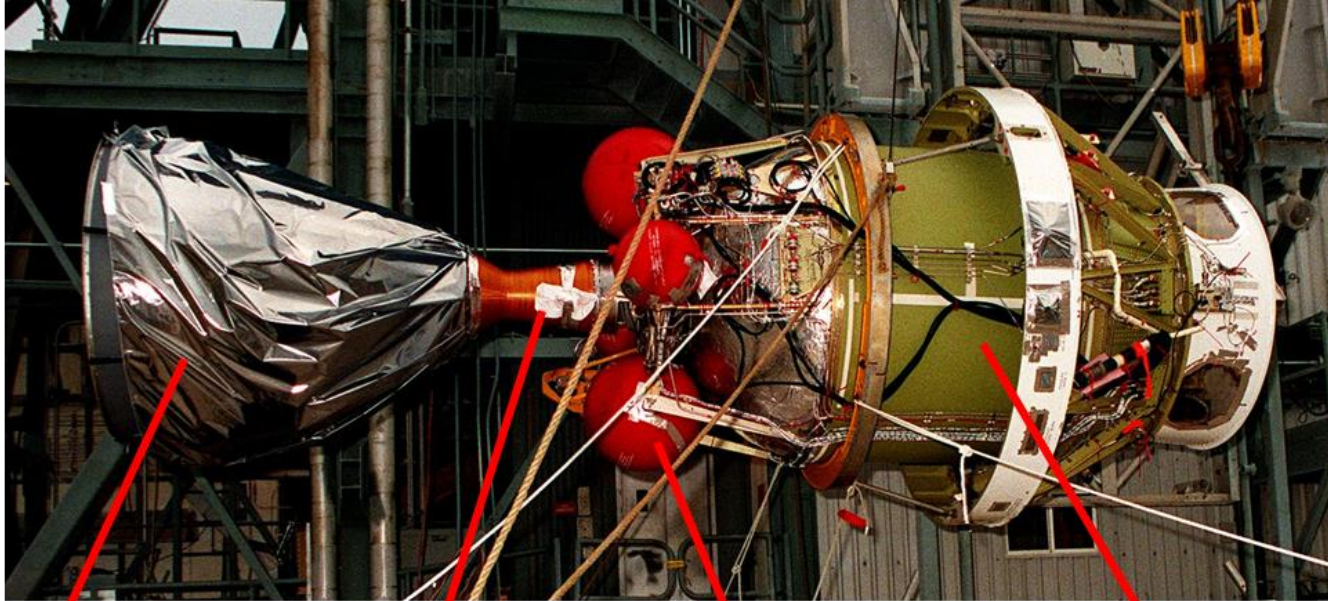


Foto: NASA



Foto: Tulsa World



Foto: Aerojet



Foto: NASA



Foto: NASA

Sixth IAASS Conference, Montréal, Canada, May 21–23, 2010

RESULTS OF THE IAASS RE-ENTRY ANALYSIS TEST CAMPAIGN 2012

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ABSTRACT

The Fourth IAASS Launch and Re-entry Safety Workshop was held at the NASA Wallops Flight Facility in September 2012. This was a joint workshop of the two IAASS Technical Committees for Space Hazards and Launch Range Safety. Since the second workshop in 2010, re-entry analysis test campaigns became a regular activity of these workshops. The purpose of these test campaigns is to promote cooperation, collaboration, and

this workshop, the Delta-II Second Stage re-entry, which occurred on January 22, 1997 (international designator 1996-024B, catalog no. 23852), was used as a reference case to compare re-entry predictions. Several fragments resulting from this re-entry event were recovered on US territory (see Fig. 1). Several tools were used to simulate this re-entry event: SCARAB, DEBRISK, SESAM, and ASTOS/DARS. More results are expected from other tools, and further sensitivity analysis will also be performed in the coming workshops.