

List of Delivery Package Documentation

Honey, I Shrunk the NASA Payload, The Sequel

Interface Verification (IV)	This section verifies the final payload interface and how the payload will connect to the hosting spacecraft. Verify envelope and mounting interface. Verify electrical interface, including pin out & continuity/resistance/isolation/grounding data. Examples of how to do this would include: -photos of measurements -fit check -Coordinate Measuring Machine (CMM) data -go/no go thread info -mounting hole + connector true position data -connector pin-out verification tests (safe to mate) -grounding resistance measurement to pin-out
As-Built Bill of Material and Material Certifications	This section verifies the quality of all materials included in the payload (both interior and enclosure) and are appropriate for use in flight applications. Examples of items to include: -BOM for everything used in the payload (interior and exterior) -Certification of compliance for all external components -enclosure -enclosure threads/fastener -enclosure thread/fastener locking material -connectors
Material Item Usage List (MIUL)*	This section documents all materials and processes used in the payload assembly. Final MIUL delivered by payload team and approved by JPL. Examples include: -materials list (e.g. metals, ceramics, adhesives) -process list (e.g. metal plating, heat treatment, anodizing, painting)
Structural Verification Plan (SVP)	This section provides proof that they satisfied the SVP that will be provided by JPL. It should convince the reader that the payload will survive the required environmental tests. Examples include: -quasi-static structural analysis package -bolted joint analysis -crash/load analysis -shock/vibration simulations -thermally-induced stresses simulations
Payload User Manual	This section outlines the payload-specific integration and operational procedures.

	Examples include: -Mechanical integration -Electrical integration -Software/firmware interface and usage information -Operations guide (lab and mission use)
Special Handling Constraints Document (SHCD)	This section details constraints on JPL for safe hardware handling during assembly and integration activities. Examples include: -protected components instrument optics -ESD safety -safe fixturing or hand-holding points -packing requirements
DESIGN PACKAGE (HARDWARE AND SOFTWARE)*	This section includes detailed information about the payload design. Examples include: -All mechanical assembly and component drawings and BOM's -All electrical schematics and electronics parts lists -All software/firmware databases -System block diagrams
END CIRCUIT DATA SHEET	This section is a reference on what is behind the electrical interface (e.g. resistances, voltages, switching/signaling, etc). It includes first-layer of the electrical schematic that the instrument connects to each externally interfacing pin. This data sheet should include everything up to the first active component (e.g. the first transceiver, transistor, mux, regulator), with all passive components along the path. It may sometimes be necessary to include more of the schematic (i.e. if the function of a given pin would not otherwise be clear).
TESTING, VERIFICATION & VALIDATION (VnV)	The document details test procedures and a VnV matrix that maps results to payload requirements. Includes functional/Performance Requirements and proof. Examples include: -Test data -Run-time log
ANOMALIES LIST	This section includes anomalies, exceptions, and discrepancies related to hardware build and test with respect to hardware requirements. Examples include: -test anomalies -configuration discrepancies due to component damage/repair etc.

*the MIUL and Design package can be worked on early in the development phase with the team's project manager