

Statement of Work

747SP Aircraft Galley Inserts

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Boeing 747SP
June 19, 2012

Background

The National Aeronautics and Space Administration (NASA) operates a Boeing 747SP (Special Performance) aircraft as an airborne astronomical observatory under the Stratospheric Observatory for Infrared Astronomy (SOFIA) Program. This aircraft is operated by NASA Dryden Flight Research Center (DFRC) and is based in Palmdale, CA. As owner and operator of this unique aircraft, NASA has a requirement procure galley inserts on the main deck of the aircraft in preparation for the upcoming Science Flights.

Aircraft Information:

Type Aircraft	Boeing 747-SP-09
Engine Type	PW JT9D-7
Tail Number	N747NA
Registration	B747SP-21
Serial Number	21441
Location	Palmdale, CA
Aircraft Flight Hours, Total Time (TT)	74,680
Cycles	10,149

The SOFIA Program consists of an airborne observatory platform equipped with a infrared telescope with a 2.5-meter primary mirror, and multiple subsystems to support the telescope and other scientific instruments capable of infrared and sub-millimeter observations. The aircraft can operate throughout the world at a ceiling of 45,000 feet. The telescope looks out of an open cavity in the side of the aircraft and allow astronomers to obtain sharper infrared images than ever before for a planned operational life of 20 years starting in 2014.

The SOFIA Observatory aircraft will be required to support multiple missions that will consist of diverse crewmembers from around the world as well as students from Universities and High Schools for flight durations up to 12 hours. As a result, installation of a galley to support the mission crew, aircrew and other personnel onboard the aircraft is a requirement. The galley in the main cabin of the aircraft is required to provide personnel with cold storage for food, supply of hot and ambient temperature water, hot beverages, microwaves, sink and waste storage.

Scope

This Statement of Work is for the procurement of FAA certified galley inserts for the SOFIA aircraft galley.

Performance of this Statement of Work includes the use of commercial hardware and services to satisfy the stated requirements of NASA SOFIA flight and science operations.

Tasks

Delivery of the following galley inserts:

- Two ACE 9602 refrigerators with approximately 6.6 cubic feet of interior space each (or equivalent)
- One TIA WaveJet Microwave ovens (or equivalent)

Functional Requirements

1. The refrigerators and microwave shall be new fully operational components.

Performance Requirements

1. All electrical appliances shall be powered from 115VAC, 400Hz, three phase power

Physical Requirements

1. The Galley inserts shall be include the following items:
 - One microwave Ovens not to exceed 35 pounds
 - Two 6.6 Cu ft Refrigerators with flat wire shelving, not to exceed 120 pounds each

Safety Requirements

1. The SOFIA aircraft galley refrigerator compartments shall be placarded to show individual maximum allowable loads.

Human Factors

1. The SOFIA aircraft galley insert latching devices shall have a visual indication of full positive engagement.

Parts, Materials and Processes

1. The SOFIA aircraft galley parts, materials, and processes shall be selected from best commercial aircraft industry practices.
2. The galley inserts used shall be in accordance with FAR 25.601 and 25.603.

Engineering Support

1. Provide all Engineering Documents associated with the galley. This shall include the following:
 - Engineering Drawings
 - Installation Drawings
 - Installation Specifications
 - Installation Procedures
 - User Documents and IPC

Deliverables

1. This includes the following aircraft certified items:

- One TIA WaveJet Microwave ovens (or equivalent)
 - Two Air Cabin Engineering ACE 9602 Refrigerators (or equivalent)
2. Operation, Installation and maintenance manuals.
 3. All applicable drawings

Safety and Quality Assurance

1. All supplied materials and hardware used for installation must have an accompanying FAA 8130-3 Airworthiness document
2. Provide a Certificate of Conformance that includes:
 - As part of each shipment, the manufacturer shall certify contract conformance to the Government.
 - Manufacturer shall identify the shipped product in a manner that is traceable to the included Certification of Conformance.

The Certification of Conformance shall include:

- Verification of acceptability of all articles before shipment – by completion of the necessary inspections, tests, stress analysis, audits, process controls and records reviews.
- Identification of the contract, and relevant line item number.
- Identify the manufacturer's part number or serial number (when applicable).
- Identify the shipped quantity.
- Be signed by a duly authorized officer or quality representative of the manufacturer – whose name and title shall be legible.

3. Delivery Requirements

- To assure protection from damage during normal handling, transport, and storage after receipt, articles and materials shall be packaged and preserved in accordance with NPR 6000.1 – Packaging, Handling, and Transportation:
 - Level B – Preservation, Packaging, and Packing.
 - Class I – Shipping and Handling.
- Marking shall include, as a minimum, nomenclature, part number, quantity, supplier and temperature handling requirements.
- Items containing hazardous materials shall have the manufacturer's Material Safety Data Sheet (MSDS) included.
- Articles or materials that have shelf life limitations or storage control requirements imposed by the manufacturer, Government, NASA or the contractor shall be accompanied by positive indication of such limits. Examples include manufacturing date, cure date, assembly date or temperature storage limitation.

4. Certified Material Test Report and Aircraft Fastener Testing

Supplier shall include in each shipment the raw material manufacturer's test report. The test report shall certify that the relevant lot of raw material has been tested, inspected and verified compliant with the applicable specifications and

is traceable to the Certified Material Test Report.

The Certified Material Test Report shall contain the following:

- Identify the raw material heat/lot number to which the report applies.
- Identify the applicable raw material specifications, by number and revision level.
- List the actual test / inspection values obtained for each chemical and property in the raw material specifications.
- Identify the raw material manufacturer.
- Be signed by a duly authorized officer or quality representative of the raw material manufacturer.
- Test specimen gage diameter per ASTM E
- Specifications including revision numbers or letters to which the material has been tested and/or inspected
- When the material specification requires quantitative limits for chemical, mechanical, or physical properties, the test report shall contain the actual test and/or inspection values obtained.
- No unauthorized processes (i.e. re-melt) shall be allowed.

Non-Destructive Evaluation Certifications

- When Non-Destructive Evaluation is required the contractor shall provide a Certificate of Conformance (C of C) to certify that the material meets the related requirements.

Independent Laboratory Testing

- If the material was altered (forged, rolled, heat treated etc.) subsequent to procurement from the mill and prior to delivery to DFRC, an Independent Laboratory Test shall be submitted with the material. The testing must be performed after all subsequent conversion processing. The test report must comply with requirements above for Manufacturer Test Certifications.

Prohibited material process

- The contractor shall not provide material that has been machined down, sawed or by any other means to achieve the requested thickness or diameter.
- The contractor shall not substitute cut plate for bar stock.

Electrical wire for aircraft

- Polytetrafluorethylene (PTFE) insulation, or equivalent, not to include polyvinylchloride (PVC).
- Wire Selection – Select wire so that the rated maximum conductor temperature is not exceeded for any Combination of electrical loading, ambient temperature, and heating effects of bundles, conduit, and other enclosures. Factors to be considered in the selection are operating voltage, circuit current, temperature, mechanical strength, voltage drop, abrasion, flexure, pressure altitude, and chemical resistive requirements. Wires will

be of sufficient size to ensure that they will provide adequate current – carrying capability and that voltage drops will be within limits required to provide satisfactory operation of equipment. Voltage drop effects must be carefully considered during wire gauge selection, especially when low impedance devices (such as multiple strain gauges, meter movements) or long wire runs are used. To avoid unnecessary weight, use the smallest size wire compatible with operational and performance requirements. Wire selection guidance is contained in section 6 of SAE AS50881, including wire ampacity derating factors such as altitude, wire bundling effects, etc.