

**K0000191099-GEN
REVISION BASIC**

STATEMENT OF WORK (SOW)

CSITU

VACUUM JACKETED PIPE SPOOLS

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ENGINEERING AND TECHNOLOGY DIRECTORATE

National Aeronautics and
Space Administration

John F. Kennedy Space Center



STATEMENT OF WORK

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CSITU

VACUUM JACKETED PIPE SPOOLS

Prepared By:

Carl Exline, LMSSC
Fluids Engineer

Concurrence:

Ted Adams, NEF2
GOVERNMENT Fluids Design Branch Chief

Michael P. Williams, KSC-SMASS
GOVERNMENT Quality

Ed Thompson, NEF2
Lead LH2 Design Engineer

Approved by:

Steve Kugelmann, ESC
Systems Engineer

Steve N. Kyramarios
Project Manager

This signature page is electronically signed in KSC Design Data Management System (KDDMS)

STATEMENT OF WORK

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RECORD OF REVISIONS/CHANGES		
REV LTR	DESCRIPTION	DATE
-	Basic Issue	March 21, 2014

STATEMENT OF WORK

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Acronyms

ACA	After Contract Award
ADP	Acceptance Data Pack
ANSI	American National Standard Institute
AR	Acceptance Review
ASME	American Society of Mechanical Engineers
ASNT	American Society of NonDestructive Testing
ASQ	American Society for Quality
C of C	Certificate of Compliance
CM	Configuration Management
CSITU	Core Stage Intertank Umbilical
GMIP	Government Mandatory Inspection Point
GPA	Government Quality Assurance
GSI	Government Source Inspection
ICPO	Inspection Control Point Outline
ISO	International Organization for Standardization
KSC	Kennedy Space Center
LH ₂	Liquid Hydrogen
LN ₂	Liquid Nitrogen
MIP	Mandatory Inspection Point
MLI	Multi-Layer Insulation
NDE	Non-Destructive Evaluation
NPD	NASA Policy Directive
QAR	Quality Acceptance Representative
PT	Penetrant Testing
RT	Radiographic Testing
SAE	Society of Automotive Engineers
SOW	Statement Of Work
VJ	Vacuum Jacketed
WPS	Weld Procedure Specification
WPQ	Welder/Welding Operator Procedure Qualification

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1.0 PURPOSE AND SCOPE

This Statement of Work (SOW) defines the effort for the design, fabrication, testing and delivery of a Liquid Hydrogen (LH2) Vacuum Jacketed Piping.

The government will specify the basic system piping requirements along with spool drawings showing pipe dimensions, fittings and spacer locations. This information is provided to the Contractor for creation of shop drawings that further detail spacer design, field joint design and Multi-Layer Insulation (MLI)/Getter design.

The Contractor shall fabricate the pipe sections from the shop drawing. The Contractor shall provide the design and fabrication drawing details.

The Contractor shall provide the items dictated by specifications and the applicable piping code, e.g. material specifications, weld certs/inspections, dimensional verifications, test results, etc. **(A21)**

2.0 APPLICABLE DOCUMENTS

The latest revision of the documents listed below form a part of this SOW to the extent specified herein.

2.1 Precedence

In the event of conflict between the referenced documents and the contents of this SOW, the order of precedence shall be as follows:

- 1) SOW
- 2) Procurement specification (Section 2.3)
- 3) Procurement drawings (Section 2.4)
- 4) Government documents (Section 2.5)
- 5) NASA documents (Section 2.6)
- 6) KSC documents (section 2.7)
- 7) Department of Defense documents (section 2.8) and
- 8) Non-governmental documents (section 2.9)

2.2 Specifications, References and Documents

The Contractor shall be responsible for reviewing all of the drawings, specifications, and references; and for notifying the Contracting Officer of any concerns.

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The Contractor shall be responsible for obtaining all standards, specifications, and documents identified below and or referenced in the drawings and specifications.

If any of the documents invoked herein are changed during the period of performance of the Delivery Order, the Contractor shall not use the later issue without prior written approval of the Contracting Officer.

2.3 Procurement Specification

Document Number	Revision	Title
K0000191097-SPC	Basic	CSITU Pipe Specification, Vacuum Jacketed, LH2 Service

2.4 Procurement Drawings

Document Number	Revision	Title
K0000067862	Basic	PIPE SPOOL 8 x 10 VACUUM JACKETED, LIQUID HYDROGEN VENT

2.5 Governmental Documents

Document Number	Revision	Title
None		

2.6 NASA Documents

Specification Number	Revision	Description
NPD 8730.5	B with Change 2	NASA Quality Assurance Program Policy

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2.7 KSC Documents

Specification Number	Revision	Description
KSC-C-123	J	Surface Cleanliness of Ground Systems Support Equipment Fluids Systems
KDP-P-5042	Basic	Engineering and Technology Directorate Acceptance Data Package Process Document
KDP-F-5042 A-K	Basic	Acceptance Data Package Form Documents

2.8 Department of Defense Documents

Specification Number	Revision	Description
None		

2.9 Non-Governmental Documents

Specification Number	Revision	Description
ISO 17025	2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI/ISO/ASQ 9001	2008	American National Standard Quality Management Systems Requirements
ASME Y14.100	Edition 4	Engineering Drawing Practices
ASME Y14.41	Edition 12	Digital Product Definition Data Practices
ASME Y14.5	Edition 9	Dimensioning and Tolerancing
ISO 10012	2003	Measurement Management Systems - Requirements for Measurement Processes and Measuring Equipment - First Edition
SAE AS9003	A	Inspection and Test Quality System
SAE AS9100	C	Quality Systems Aerospace – Model for Quality Assurance in Design, Development, Production, Installation, and Servicing
ASME B31.3	2012	Process Piping

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3.0 TASK DESCRIPTION

The contractor shall deliver pipe to the facility designated by the government. The Contractor shall deliver the following VJ pipe spools in NPS pipe sizes conforming to K0000191097-SPC CSITU Pipe Specification, Vacuum Jacketed, LH2 Service.

Item	Qty Units	Fluid	Spool No	Type	Size	Drawing Number	Description	Delivery Date
1	1	LH2	1050	VJ Pipe Spool reducer	8x10 10x12	K0000067862	Vent	Feb. 1 2015
2	1	LH2	NA	NA	12	Vendor drawing	Flange for Female Bayonet	Sept. 1 2014
3	3	LH2	NA	NA	10	Vendor drawing	Flange for Female Bayonet	Sept. 1 2014
4	3	LH2	NA	NA	8x10	Vendor drawing	Bayonets, Male	Sept. 1 2014
5	6	LH2	NA	NA	10x12	Vendor drawing	Bayonets, Male	Sept. 1 2014
6	3	LH2	NA	NA	8x10	Vendor drawing	Bayonet, Male Pressure Caps	Sept. 1 2014
7	6	LH2	NA	NA	10x12	Vendor drawing	Bayonet, Male Pressure Caps	Sept 1 2014
8	2	LH2	NA	NA	10X12	Vendor drawing	Bayonet, Female	Sept. 1 2014

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4.0 CONTRACTOR CREDENTIALS AND REQUIREMENTS

The Contractor shall meet the following requirements contained in this section and the procurement specifications for the performance of this procurement.

4.1 General

The following general scope applies:

The government (or its designated representative agent) reserves the right to witness and inspect any part during the construction, fabrication, assembly and test period at the Contractor or Contractor's suppliers / subcontractor's site.

Paragraphs describing the Contract Data Requirements Lists (CDRL) deliverables are indicated by a (C) after the corresponding paragraphs. Appendix B provides a summary of CDRL deliverables.

Paragraphs describing what is to be included in the Acceptance Data Package (ADP) are indicated by a (A) after the corresponding paragraphs. Appendix C provides a summary of ADP deliverables.

The Contractor shall submit for approval detailed shop drawings in accordance with LH2 VJ pipe specification K0000191097-SPC CSITU Pipe specification, vacuum jacketed, LH2 service. **(A11, A12)**

4.2 Procedure Approval

The Contractor shall provide packaging, handling, storage and transportation procedure, weld process procedures and cleaning procedure for government review and approval. Weld process procedures shall be approved prior to start of fabrication. Packaging, handling, storage and transportation plan shall be approved 30 days prior to delivery date. Cleaning procedure shall be approved prior to start of fabrication. **(A26, C30, C31)**

4.3 Quality Assurance Program and Plan

The contractor shall develop, implement, and maintain a project specific quality assurance program that will ensure that all requirements of this SOW are met. At the contractor's discretion and in whole or in part, the contractor may develop a project specific quality assurance plan (QAP) or use an existing higher level inspection system as long as that system is revised and identified in the project-unique QAP. Each element of the specified quality standard shall be addressed to describe the philosophy and approach for implementation. This can be satisfied by

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Contractor's existing quality manual and procedures. The only exceptions allowed will be processes noted in Section 7 of AS9100 and/or ANSI/ISO/ASQ 9001-2008.

4.3.1 Quality Plan

The Contractor shall deliver and maintain a Quality Plan. The Contractor shall detail their planned quality controls and methods for accomplishing the applicable tasks required to satisfy the quality requirements of the government Policy Directive (NPD) 8730.5 for the hardware being procured in a Quality Plan. The Quality Plan shall identify, as applicable, the specific quality activities (implementation) related to the design, procurement of materials/subcomponents, fabrication, test, storage, and shipping to assure the quality of the items delivered. The plan shall reference the Contractor's quality manual and procedures as necessary to fully describe the Contractor's quality system. The Quality Plan overview shall initial be submitted with the Contractor's proposal. The Quality Plan shall be base lined at contract award with additional changes as required. Changes shall be incorporated by change page or complete reissue.

Each quality element of Society of Automotive Engineers (SAE) AS9100 in conjunction with either ANSI/ISO/ASQ Q9001-2008 or SAE AS9003 and/or as applicable ISO 17025 shall be addressed to describe the philosophy and approach for implementation. This can be satisfied by Contractor's existing quality manual and procedures. The only exceptions allowed will be processes noted in Section 7 of AS9100 and/or ANSI/ISO/ASQ 9001-2000. A copy of the Quality System Manual and 1st tier procedures shall be submitted with any required quality plan. (C9, A21)

4.3.2 Inspection Control Point Outline

Special inspections, called Mandatory Inspection Point (MIP), will be designated by the Government during the performance of this contract. Prior to the start of work, the Contractor shall provide the government Quality Assurance Representative (QAR) a schedule and Inspection Control Point Outline (ICPO) which shows the work sequence(s) to be employed during the performance of this Purchase Order. The contractor's schedule/ICPO must indicate what types of contractor inspections will be performed and where in the contract's sequence of events they will be accomplished. If applicable, the schedule/ICPO must also indicate the specification(s) (including revisions) and/or other documentation that will be used to perform the indicated inspections. The Government will identify which inspections/tests/work steps require Government Quality Assurance (GQA) witness. These inspections/tests and/or work steps will be designated as Government Mandatory Inspection Points (GMIP). The contractor shall notify the government QAR at least five (5) working days prior to the occurrence of a scheduled, designated GMIP through the subcontract administrator. Designation of GMIPs does not relieve the contractor of the obligation to perform all contractually required inspections. (C10, C29)

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4.3.2.1 Mandatory Inspection Points

Quality Assurance inspection shall be included in contractor procedures and ICPO, but not limited to the following tasks:

Initial Acceptance test of Hardware (prior to start of certification tests) such as:

- Hydrostatic Leak Test
- Internal pipe leak Test
- Vacuum retention test
- LN2 cold shock test

4.3.2.2 Government Mandatory Inspection Points

In addition to the MIPs, the government inspection shall be included, but not limited to the following tasks:

- Final Acceptance Test

The Government reserves the right to perform inspections at any point in the fabrication process. **(A21)**

4.3.2.3 Government Source Inspection

The Contractor shall notify the responsible QAR, through the subcontract administrator at least five (5) working days in advance of the date goods or services will be ready for tests, inspections, or other MIPs, as required evidence of Government Source Inspection (GSI) must be indicated by the QAR's stamp or signature on the Contractor's shipping document. In the event the QAR cannot be contacted, notify the government Contracting Officer immediately. All work on this Purchase Order/Contract is subject to inspection and test by the Government at any time and any place. **(C15, C29)**

4.3.3 Calibration System

The Contractor shall have a documented calibration system that meets the requirements of ISO 10012 Measurement Management Systems - Requirements for Measurement Processes and Measuring Equipment - First Edition, or equivalent standards. **(C14, A15, A21)**

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4.3.4 Applicable Quality Clauses

The quality clauses listed below apply to this procurement. Quality clauses are located in **Appendix D**.

- Q3 Government's/Buyer's Source Inspection
- Q4 Certificate of Conformance
- Q8 Physical and/or Chemical Test Reports
- Q17 Acceptance Data Package
- Q21 Packaging and Handling
- Q22 Shipping Documents
- Q34 Traceability- Raw Material
- Q35 Certifications
- Q39 Cleanliness and Packaging Requirements
- Q40 Nondestructive Inspection

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5.0 PROJECT REQUIREMENTS AND CONTRACT DELIVERABLES

5.1 Project Schedule

The Contractor shall develop and maintain a project schedule and use it to track project's progress. The project schedule shall illustrate the schedule that the Contractor intends to follow over the period of performance. The schedule shall be of sufficient detail to ensure that slips to events and product deliveries shall be projected and reported back to the government in a timely manner. The program schedule shall be expanded if notified by the government that the level of detail is insufficient. The Contractor shall provide a logic linked project schedule in Microsoft Project 2003 or later. Draft schedule shall be submitted with proposal. Schedule baseline shall be established 30 days after contract award. After baseline, status of schedule progress will be required at two week status updates, coincident with bi-weekly teleconference meetings. (C2, A21)

5.2 Monthly Status Reports

The Contractor shall provide a monthly status report to the government. This report shall provide data for the assessment of monthly cost, technical and schedule progress and summarize the results of the entire contract work. (C1, A3)

The monthly status report shall include:

- A. Work accomplished for current reporting period, including a report of overall cost, technical and schedule performance.
- B. Work planned for next reporting period.
- C. Current problems which impede performance or impact program schedule or cost, and proposed corrective action.
- D. Other information that may assist the government in evaluating the Contractor's cost, technical and schedule performance. (A3)

5.3 Meetings

The Contractor shall support the meetings and reviews defined in this SOW. Contractor shall maintain meeting minutes with any action items identified with responsible organizational representative, date action initiated, corrective action and action completion date. (C3, A3)

5.3.1 Technical Kickoff Review

The Contractor shall conduct a Technical Kickoff Review teleconference not later than one (1) week after contract award. At a minimum this review should cover proposed basic high level concepts, and initial schedule for design and certification testing. This meeting will also serve as first technical exchange of Contractor engineering and the government engineering for clarification of any technical items.

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5.3.2 Bi-Weekly Teleconference

The Contractor shall support a teleconference every two weeks (bi-weekly) for schedule and technical status with the government engineers and the procurement the government agent. The Contractor shall include, as a minimum, a review of the program schedule, document status, design, development hardware fabrication and test status, problem identification, and any efforts undertaken for corrective action. (C2, C3, A21)

5.3.3 Drawing Review

The Contractor shall conduct a drawing review teleconference meeting with the government. Contractor shall deliver a drawing review package a minimum of 14 calendar days before the meeting and maintain the drawings and the government design comments following the review. Vendor shall provide one of the following responses for each government design comment during drawing review: accept, reject, accept with intent or duplicate. Clarification notes shall be provided to ensure accurate comment implementation. (C5, C6, All, A12, A25)

5.4 Request for Information

After contract award, the successful Subcontractor shall, when contract information or clarification is required by the Subcontractor, prepare and submit a Request for Information (RFI)/Clarification form. The Subcontractor shall indicate on the RFI if when the concern /question have an effect on schedule or cost. The Kennedy Space Center (KSC) form (KSC Form 8-268) will be provided to the successful Subcontractor at the post award pre-work meeting. (C18, A5)

5.5 Deviation / Waivers

The Contractor shall utilize KSC Form 8-69 for all deviation or waiver requests and forward these to the SCA. These forms will be provided to the Subcontractor at the post award pre-work meeting. (C17, A6)

5.6 Transportation

All pipe sections upon successful completion of required tests are to be stored at vendor facility until subcontract administrator provides further shipping direction. Packing list shall be provided with all deliveries. (A2)

5.7 Configuration Management

The Contractor shall implement Configuration Management (CM) in accordance with AS9100 on hardware. The government has the right to perform configuration audits at any time during the fabrication process.

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5.8 Acceptance Data Package

An ADP shall be maintained per KDP-P-5042 through the duration of the contract and contain all correspondence between the Contractor and Government, quality control documents, final acceptance inspection records and any other documentation required to administer the successful completion of the contract. The ADP shall be included with each shipment for the units or items shipped consisting of one electronic copy and one hard copy for each deliverable item. The ADP shall be assembled in accordance with KDP-P-5042. In the event of ADP disapproval by the Government, the Contractor shall initiate immediate corrective action and shall resubmit for approval within five (5) working days

Contractor shall deliver the CDRL and ADP items listed in Appendix B and Appendix C, respectively in accordance with KDP-P-5042.

5.8.1 ADP / CDRL Format

All documents submitted shall contain the following:

1. Unique document number
 2. Document revision level and date
 3. Title page with Subcontractor's name and address, document number, revision level, date, title, part number, nomenclature of the part, and Contract number
 4. Revised documents shall have a revision summary detailing the changes and pages affected
 5. Index page
 6. Signature approval page
 7. Table of contents (does not apply to sheet drawings)
 8. All pages, appendices, figures and tables shall be numbered and listed in the table of contents
 9. All data deliverables shall be delivered electronically in common computer formats such as Word, Excel, Acrobat, etc. unless otherwise specified. All engineering records - drawings, reports, calculations, etc. shall be provided to the government in root file format as well as an image file such as Portable Document Format (PDF) and two clean hard copies. All Contractor detail proprietary documents shall be appropriately marked per individual sheet.
- (A21)**

5.8.2 ADP / CDRL Deliverables

The Contractor shall deliver and maintain the following document(s):

- Material Reports shall include
 - American Society of Mechanical Engineering(ASME) B31.3/the government Fabrication, Assembly, Erection, and Examination reports
 - Provide material reports for all materials used in construction to ensure compliance with ASME B31.3 reference paragraph 323.1. Material reports shall contain mechanical and chemical properties.

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- Provide impact test results for all materials requiring impact test per ASME B31.3 reference paragraph 323.2.2.
- Material thickness used in calculations shall match actual ordered thicknesses
- Identify heat treatment state for materials
- Material certification of conformance
- Material certification records for all material and components traceable to original vendor
- Provide weld data, WPS, WPQs, etc in accordance with ASME B31.3 reference paragraph. 328
- Provide written letter that welding materials are maintained in accordance with ASME B31.3 reference paragraph 328.3, 328.3.2, 328.3.3 as applicable.
- Provide as-built shop drawings showing weld sizes in accordance with ASME B31.3 reference paragraph. 328.5.2.
- Provide as-built shop drawings showing welded branch connection dimension in accordance with ASME B31.3 reference paragraph. 328.5.4.
- Provide examiner's qualifications in accordance with NASA-SPEC-5004 and ASME B31.3 reference paragraph 342
- Provide nondestructive evaluation(NDE) report radiographic testing, penetrant testing, and visual inspection (RT, PT, VE, etc) for each spool in accordance with NASA-SPEC-5004 and ASME B31.3 reference paragraph 344
- Provide leak test report for each spool in accordance with ASME B31.3 reference paragraph 345
- Provide test reports for tests in accordance with the VJ Pipe specification
- Lifting plan for each spool including center of gravity annotated, lifting points and any special lifting or handling equipment.
- Provide heat leak data for all Bayonets
- Digital radiograph negatives may be used, in lieu of film, provided digital formats satisfy ASME B31.3 for clarity in detecting "severe cyclic" flaw sizes, or have no associated compression algorithm that loses resolution upon file handling. Viewing software program shall be provided with computer operating system requirements. Native files shall be provided Two-dimensional (2-d) graphical data shall be delivered in one of the following lossless image format:
 - Portable network Graphics (image/png)
 - Tagged image Format File (Image/tiff)
 - Joint Photographic Experts Group 2000 (Image/jpg)
 - Computer Graphics Metafile (image/cgm)
- Packaging protection, and transportation plans to KSC
- Certificate of conformance to the SOW and procurement specification
- Historical log/Notes/Comments
- Form DD250/Form 1149 or equivalent material receiving inspection checklist
- All request for Information (RFI's)
- All deviations/waivers

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- All Nonconformance and unexplained anomalies

(C7, C8, C12, A4, A17, A21, A23)

5.8.3 Drawings and Associated Lists

Engineering drawings and associated lists shall be provided to meet the requirements of ASME Y14.100 and ASME Y14.41. This documentation shall define the detailed design to support manufacturing and testing of the hardware. In addition, Geometric Dimensioning and Tolerance is required and shall be in accordance with ASME Y14.5. In addition, 2D and 3D Computer Aided Design (CAD) models shall be submitted between milestones as requested by the government.

(C5, A21, A25)

6.0 GOVERNMENT FURNISHED EQUIPMENT

The Contractor shall be provided with government furnished material identified in Appendix A.

7.0 OWNERSHIP / RIGHTS TO DESIGN

The government requires full release of all drawings, calculations, procedures, processes, etc. for review / approval to fabrication / test to the government and any of the government's subcontract teams associated with the program integrated design, interfaces, and operations of the LH2 VJ system. The government may potentially later utilize in troubleshooting or emergency response, or in the event the Contractor became insolvent during the life of program without the rights of these components being sold or transferred to another company representing the Contractor. The government does not request ownerships/rights to have the marked proprietary components manufactured by others.

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Appendix A: Government Furnished Equipment (GFE)

Item	Quantity	Part Number	Description	Date Available
1	1	79K14672-3	Vacuum Valve Assembly	Contract Award

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Appendix B: Contract Data Requirements List (CDRL)

CDRL Item	SOW Paragraph	Description	Quantity	Delivery Date
C1	5.2	Monthly Status Reports	As Required	Monthly & with ADP
C2	5.1 5.3.2	Project Schedule	As Required	30 days After Contract Award, updates every 2 weeks & with ADP
C3	5.3 5.3.2	Meeting Minutes	As Required	After each Technical Review
C5	5.3.3 5.8.3	Drawing Review Package	Per negotiated schedule	Drawing Review
C6	5.3.3	Clarification Notes	As Required	Drawing Review
C7	5.8.2	Certification Plan	Two	Acceptance Review & with ADP
C8	5.8.2	Data Requirements Matrix	Two	Acceptance Review & with ADP
C9	4.3.1	Quality Plan	Two with Updates As Required	Contract Proposal and ACA
C10	4.3.2	Inspection Control Point Outline	Two	Electronic Prior to start of fabrication and Hard Copy with ADP
C11	5.8	Acceptance Data Package	Three	1 Electronic 10 days prior to hardware delivery for review and 1 Electronic and 1 Hard copy with delivery of hardware
C12	5.8.2	Packaging, Protection and Transportation Plan	One	After as-built drawings, acceptance, qualification testing and associated reports are complete
C14	4.3.3	Calibration Documentation	Two	Prior to fabrication & with ADP
C15	4.3.2.3	Government Source Inspection	As required	5 working days prior to date goods will be ready for tests, inspections or other MIPs.
C17	5.5	Deviation/Waivers	As Required	Approved deviation/waivers included with ADP

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CDRL Item	SOW Paragraph	Description	Quantity	Delivery Date
C18	5.3.1	Request for Information	As Required	Full set delivered with ADP
C29	4.3.2 4.3.2.3	Mandatory Inspection Point Notification	As Required	5 days prior to each MIP/GMIP
C30	4.2	Weld process procedures	One	Prior to start of fabrication for approval
C31	4.2	Packaging, Protection and Transportation Plan	One	30 days prior to delivery

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Appendix C: Acceptance Data Package (ADP) Items

ITEM	DESCRIPTION	FORMAT	PARAGRAPH NUMBER
A1.	Approvals	KDP-F-5042C	5.8
A2.	Delivery/Acceptance /Shipping Document	DD Form 250	Not Applicable
A3.	Historical Log/Notes/Comments	Supplier Format Acceptable	5.2 5.2D 5.3
A4.	Certificate of Conformance	Supplier Format Acceptable	5.8.2
A5.	Request for Information (RFI)	Form 8-268	5.3.1
A6.	Waiver/Deviation Records	KDP-F-5042D	5.5
A7.	Non-conformance and Unexplained Anomalies	Supplier Format Acceptable	5.8
A8.	Shortages	KDP-F-5042E	5.8
A9.	Unplanned/Deferred Work	KDP-F-5042F	5.8
A10	Preplanned/Assigned Work	Supplier Format Acceptable	5.8
A11.	As-Designed / As-Built Indentured Listing	KDP-F-5042G KDP-F-5042H	4.1 5.3.3
A12.	Engineering Drawing Tree	Supplier Format Acceptable	4.1 5.3.3
A13.	Operating Time/Cycle	KDP-F-5042J	5.8
A14.	Age Sensitive/Time-Action Items	KDP-F-5042K	5.8
A15.	Nonstandard Calibration Records	Supplier Format Acceptable	4.3.3 5.8
A16.	Repair Limitation Data	Supplier Format Acceptable	5.8
A17.	Pressure Vessel Data/Certification Plan	ASME Form U-1	5.8.2
A18.	Pyrotechnic Data/Certification	Supplier Format Acceptable	Not Applicable
A19.	Battery Data/MSDS	Supplier Format Acceptable	Not Applicable
A20.	Temporary Installations	Supplier Format Acceptable	5.8

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ITEM	DESCRIPTION	FORMAT	PARAGRAPH NUMBER
A21.	Acceptance Verification Matrix/Evidence of Acceptance	Supplier Format Acceptable	1.0 5.1 5.3.2 5.8.2 4.3.1 4.3.3 4.3.2.2 5.8.1 5.8.2 5.8.3
A22.	Completion & Hardware Analysis/Certification	Supplier Format Acceptable	5.8.2
A23.	Hardware Analysis/Certification	Supplier Format Acceptable	5.8.2 5.8
A24.	Packaging, Handling, Storage, Transportation (PHS&T) Requirements	Supplier Format Acceptable	5.8
A25.	Notes/Comments	Supplier Format Acceptable	5.3.3 5.8.3
A26.	Drawings & Specifications (CAD files on CD)	Supplier Format Acceptable	5.8 4.2
A27.	Vendor / Sub-tier Vendor Documentation	Supplier Format Acceptable	5.8
A28.	Warranty (ies)	OSHA 29 CFR 1910.1200 (G)	5.8

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Appendix D: Quality Clauses

Q3 Government's/Buyer's Source Inspection

The Government/Buyer has the right to inspect all Quality and Manufacturing processes at the Supplier's plant to include any or all work included in this Order. The Supplier's and Supplier's lower-tier Supplier's Quality and Manufacturing processes are subject to review, verification, and analysis.

Q4 Certificate of Conformance (C of C)

Supplier shall provide a C of C which states that the material, parts or services specified in this Order and furnished to Buyer comply with the contractually specified requirements. The Supplier shall maintain objective evidence of contract compliance for a period of at least four (4) years after product delivery and produced upon request by an authorized Buyer representative. The C of C guarantees that the furnished product will meet the specified requirements if inspected or tested. Suppliers providing C of C's for products produced by other manufacturers will include the name of the manufacturer as well as the lot/code listing when the product is lot/date coded by contractual specification. Buyer's Procurement Department will be notified immediately by the Supplier if they are unable to provide the specified item(s) with a quality level equal to or greater than that specified in procurement documents. The C of C must accompany the invoiced shipment of the product(s) to Buyer. C of C shall attest that the materials, parts, assemblies, or subassemblies conform to this Order's requirements. Certifications must contain the following:

1. Buyer's Order number
2. Line number (if applicable)
3. Part/serial number (if applicable)
4. Name and address of manufacturing or processing location
5. Manufacturer's lot, heat, batch, date code, and/or serial number (if applicable)
6. Quantity and unit of measurement (each, box, case, gallons, etc.)
7. Be signed and dated by an official of the company.
8. Drawings/engineering orders and specifications, with revisions, as specified on Buyer's Order
9. Bayonets and pressure caps comply with ASME B31.3.
10. Heat leak rates for Bayonets.

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Q8 Physical and/or Chemical Test Reports

For each lot in each shipment, Supplier shall submit one reproducible record with results of the chemical and/or physical material analysis which provide quantitative evidence that the material shipped complies with the applicable specifications as stated in Buyer's Order. Reports must provide manufacturer's name, specification number(s) and, if specified on Buyer's Order, the revision date or change letter, and must be identified to or correlated with specific lots.

Q17 Acceptance Data Package

Supplier shall submit with each shipment of a part or assembly an acceptance data package with Supplier name, Buyer Order, part nomenclature, part number and serial number with the applicable data items per KDP-P-5042.

Q21 Packaging, Handling, and Labeling

The Supplier shall be responsible for ensuring that items provided under this Order are packaged in such a manner that the dimensional integrity is preserved, contamination and corrosion are prevented, and no physical damage occurs. Packaging when specified shall be in accordance with the drawing, appropriate ASTM, MIL, or other applicable Buyer specified requirement and prevents damage, deterioration, substitution or loss in transit. The Supplier shall label the exterior of the package to ensure adequate identification of precautions needed to ensure the integrity of the product being shipped. The Supplier must specify the handling and shipping methods that ensure proper and on-time delivery without damage to the product. The Supplier shall ensure that special labeling requirements shall also be listed in the appropriate shipping documents and on each package.

Q22 Shipping documents

Supplier shall furnish Commercial Shipping Documents/Packing List, capable of being photographically reproducible through two additional reproductions, showing the following (as applicable):

- P.O. Number
- Part Number(s)
- Description
- Qty Ordered
- Qty shipped
- Lot/Date Code/serialization (as applicable)
- Any handling constraints or cautions such as, but not limited to:
- Moisture sensitive components, open/store only in humidity controlled area.

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Q34 Traceability - Raw Material

Supplier shall mark each individual item and applicable documentation (e.g. test report, shipping report, or certification) to show traceability to lot, heat lot, material control or batch number. Unless otherwise directed by this contract, engineering drawing or the specification, when the size of the item does not permit marking of individual items, Supplier shall label each package or box furnished. Lots shall not be mixed.

Q35 Certifications

When the Statement of Work or Performance Work Statement for the project requires the vendor and/or individual workers to have certifications, licenses, special training, or other qualifications, written evidence to satisfy the requirement shall be submitted to the Subcontract Administrator / Buyer, for review and approval by Buyer Quality and Safety, prior to the start of the project. Additionally, the evidence shall be maintained at the job-site and be readily available for review by Buyer for the duration of the project.

Q39 Cleanliness and Packaging Requirements

The Supplier shall clean contracted, procured or GFE items in accordance with the requirements of the NASA approved cleaning procedure KSC-C-123J.

Q40 Nondestructive Inspection/Nondestructive Test Certification

The Contractor will include with each shipment a certificate for the nondestructive inspection (NDI)/nondestructive test (NDT) performed. As a minimum, the certification shall contain the following information:

- Customer's Purchase Order/Contract number
- Name and address of the Company performing NDI/NDT;
- Date of Inspection;
- Quantity of parts tested by part number;
- Specification or other requirement defining the NDI/NDT acceptance/rejection criteria;
- Inspector/name/stamp and NDI/NDT certification level;
- NDI/NDT specification including revision;
- Material or item identification (part number, heat lot number, Foundry Record (FR) number;
- Material or item traceability (serial number, lot number, batch number, lot/date code);
- Inspection results (accept/reject);
- Reference to previous NDI/NDT reports for repair/rework, if applicable;
- Reference to attached recordings, i.e., films or photographs, if applicable.

These records shall include all information required in the previous paragraph as well as acceptance / rejection criteria, and related test instrument data used in the NDI/NDT process.

K0000191099-GEN (Statement of Work (SOW) CSITU Vacuum Jacketed Pipe Spools)

Document Number: K0000191099-GEN

Version: -

Name: Statement of Work (SOW) CSITU Vacuum Jacketed Pipe Spools

Type: General (KSC)

Container: SLS ML CSITU Product

State: Released

Modified By: William Patrick

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