

	NUMBER	SOP 21-009
STANDARD POLICIES AND PRACTICES	PAGE	1 OF 8
SUBJECT QUALITY PLAN: X-47 (J-UCAS)	EFFECTIVE DATE:	1 JULY 2005
	REVISES POLICY DATED:	N/A
PREPARED BY		
Program Quality Engineer <i>Signature on File</i>		
APPROVALS		
Quality Management <i>Signature on File</i>	Operations Management <i>Signature on File</i>	
Engineering Management <i>Signature on File</i>	Program Management <i>Signature on File</i>	

1.0 SCOPE

This Quality Plan shall be applicable to the Advanced Procurement Authorization APA 484434 Fuel System in support to the Joint Unmanned Combat Air System (J-UCAS) X-47 Program.

Specific Argo-Tech Costa Mesa (ATCM) components to which the requirements of this Quality Plan apply are identified through the latest released ATCM Engineering document number 62500.

2.0 PURPOSE

This Quality Plan is purposed to communicate the methods that shall be used to assure the quality of design, development, manufacturing, assembly and testing of products provided to support the J-UCAS program. These methods shall be in accordance with the requirements and processes documented herein. All ATCM organizations, suppliers, manufacturers, and subcontractors working and participating in the JUCAS Program must comply with the requirements set forth in this Quality Plan.

3.0 FUNCTIONAL ACCOUNTABILITY

The Executive leadership of Argo-Tech Costa Mesa determines the Program Team leading and coordinating the other centers of design such as production, subcontracting, and operations.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 2 of 8
-----------------------------	--------------------------------------	------------------------------------	------------------------------

The Program Team will provide support to the Program Manager and shall include the following personnel assuring maintenance of the J-UCAS Program:

- Program Manager
- Systems Engineer
- Project Engineer
- Test Engineer
- Quality Engineer
- Contract Administrator
- Operations

(See Addendum I for J-UCAS Program Team members)

Program Management shall be responsible for orchestrating all major program team functional tasks, scheduling of assignments, goals, action items, program budgets, changes in scope, and Risk Management.

Design (Systems Engineer, Project Engineer, Test Engineer) whose main function is the technical definition of the Product, shall be responsible for all development, technical interface, certification/qualification data, outside testing lab support, and component development build.

Quality (Quality Management, including Quality Engineering, Inspection) shall be responsible for assuring all components meet regulatory/customer requirements, including nonconformance responses, corrective action, and preventive action.

Operations (Purchasing, Manufacturing, Assembly and Acceptance Testing) shall be responsible for the procuring, scheduling, delivery, production, material acquisition, handling, storage of components.

Contract Administrator shall be responsible to facilitate, negotiate, and communicate the customer's contractual requirements to all internal organizations.

4.0 REFERENCE DOCUMENTATION

Applicable ATCM Quality Management System (QMS) procedures are listed in the appropriate sections of this Quality Plan.

The latest released revisions of the following Northrop Grumman documentation are applicable to this program:

- X-47 Operational Assessment Air System Supplier Statement of Work for the Air Vehicle Fuel System - UDS2250R001.
- X-47 Operational Assessment Air System Performance Based Specification for the Air Vehicle Fuel System - UDS2250P001.
- Northrop/Grumman Supplier Quality Assurance Requirements (SQAR) Rev.L, dated 01/04/05.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 3 of 8
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5.0 QUALITY PLAN PREPARATION AND APPROVAL

The Program Team Quality Engineer shall be responsible for the development and maintenance of this Quality Plan.

The Program Manager and Engineering, Operations and Quality Management shall approve the initial release and all subsequent revisions of this Quality Plan and are responsible for communication of this Quality Plan and its revisions to all affected internal organizations.

6.0 QUALITY SYSTEM

This Quality Plan is based on the applicable requirements established by the ATCM Quality Management System (QMS) and the Northrop/Grumman Supplier Quality Assurance Requirements (SQAR).

The ATCM Quality Management System (QMS) is maintained compliant with the Aerospace Standard AS9100:2001. All ATCM organizations, suppliers, manufacturers, and subcontractors working and participating in the J-UCAS Program must comply with the applicable requirements established by the certified QMS. Whereas a conflict between the Quality Plan and QMS requirements exists, the Quality Plan shall take precedence.

Argo-Tech Costa Mesa shall inform the Buyer of Northrop/Grumman of any change to the QMS certification status.

7.0 DESIGN CONFIGURATION CONTROL

Design Configuration Management for this program will be regulated by the latest released revision of ATCM Quality Procedure QC-05.1, Engineering Document Control. Document and Data Control will receive, maintain and deploy the applicable program approved engineering documentation.

Customer approval shall be obtained for component 3-D Solid Models, Interface Control Drawings (ICD), Qualification Plans (QPP), Safety of Flight Test Procedures (SOFTP), and Acceptance Test Procedures (ATP) prior to initial release, as well as prior to release of subsequent revisions, for manufacturing, inspection or test use.

Engineering shall maintain a current and accurate Bill of Materials (BOM) for each component through the Argo-Tech Costa Mesa Business Control System to assure that the latest approved Engineering design configuration documents are used for manufacturing, inspection and testing of detail parts and components.

Revisions to Engineering design configuration shall be evaluated through the internal Change Board process to determine affect to detail parts or components previously delivered, held in-stores or currently in-work and appropriately dispositioned.

- Where “must be” dispositions are determined, Operations shall identify all affected materials held in-stores, being manufactured to internal work orders or pending delivery to open purchase orders and implement immediately actions to assure compliance to the “must be” disposition.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 4 of 8
-----------------------------	--------------------------------------	------------------------------------	------------------------------

- Where “must be” dispositions are determined to affect previously delivered product, Quality Engineering shall provide for timely reporting of nonconformities to the Northrop Grumman buyer through the Program Manager, including any continuing airworthiness actions. Notification shall include:
 - a clear description of the discrepancy,
 - identification of all suspect parts (to include mfg. dates, serial numbers, quantities, etc.) and material affected by the deficiency,
 - date'(s) delivered,
 - any information relating to the Root Cause / Corrective Action steps initiated to address the defective condition,
 - preventive measures taken to preclude recurrence of the process failure, and
 - a technical assessment and recommended disposition.

Modifications of a disclosure (additions or deletions of data) requiring subsequent issuances shall be revision controlled to provide definitive sequencing (i.e. Rev 'A', 'B' etc.).

8.0 CUSTOMER RELATED PROCESSES

Activities such as contracts, amendments, communication with the customer shall be in accordance with the latest released revision of ATCM Quality Procedure QC-03, Customer Related Processes.

The Contract Administrator shall be responsible to facilitate, negotiate, and communicate the customer’s contractual requirements to all internal organizations.

9.0 DESIGN AND DEVELOPMENT

The Design and Development process for this program will be in accordance to the latest released revision of ATCM Quality Procedure QC-04, Design Control Process – Airframe.

Design output shall meet the requirements established by the latest contractually agreed revision of the X-47 Operational Assessment Air System Performance Based Specification for the Air Vehicle Fuel System - UDS2250P001 (PBS).

System Engineering shall develop and maintain a Design Compliance Matrix and a Component Qualification Plan (QPP) defining how each PBS or Safety of Flight (SOF) design requirement will be validated / demonstrated. The document will provide reference to the applicable PBS and SOW paragraph and heading number (RE: SDRL Q100 and Q200).

System Engineering shall develop and maintain Procurement Specifications (PS) defining the design requirements for each component ensuring all necessary requirements are defined to achieve compliance to the PBS.

Components Engineering shall develop Interface Control Drawings (ICD), Assembly and Detail Part Drawings, Acceptance Test Procedures (ATP) and Component Safety of Flight

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 5 of 8
-----------------------------	--------------------------------------	------------------------------------	------------------------------

Test Procedures (SOFTP) that shall be the governing documents used for manufacturing and verification of detail parts and/or components.

All Design documents required to manufacture and verify components shall be controlled through the configuration management process.

Program Quality Engineering shall verify that Acceptance Test and Safety of Flight Test setups are in accordance with the ATP or SOFTP. Where testing is to be performed by an outside service, the Engineering Test Lab Manager shall be responsible to oversee compliance to all defined requirements.

Completed components shall be verified compliant to the latest approved design configuration through First Article Inspection in accordance with SAE-AS9102 prior to release for testing in accordance with the SOFTP. Program Quality Engineering shall verify component compliance and approve the First Article Inspection Report prior to the components release.

Safety of Flight Testing shall be strictly in accordance with the SOFTP requirements. In the event of any failure, Engineering Test shall immediately notify the Program Quality Engineer who shall ensure documentation of the failure in accordance with ATCM procedures for Control of Nonconforming Product. Engineering shall provide Failure Analysis Reporting to Northrop Grumman, through the Program Manager, for any component failing to meet SOFTP requirements.

10.0 PURCHASING

Purchasing of supplied materials and services for this program will be in accordance to the latest released revision of ATCM Quality Procedure QC-06, Purchasing.

Foreign nationals are restricted from participation in or access to this program without U.S. Government approval.

Suppliers shall be required to maintain a quality system that evidences control of the quality of products and services provided. Suppliers maintaining a quality system in accordance with a recognized industry standard, such as ISO9001 or AS9100, shall be preferred. The ATCM Supplier Quality Manager maintains the responsibility and authority over determination of the adequacy of the supplier's quality system.

All suppliers to this program shall be on ATCM's Approved Supplier Listing.

All special processes shall be performed by suppliers on ATCM's Approved Special Process Supplier Listing. Suppliers may request approval to use sub-tiers that are not on ATCM's Approved Special Process Supplier List if the supplier can provide adequate evidence of sub-tier approval and control through their own quality system or if the sub-tier maintains NADCAP certification for the applicable special process. All such requests must be submitted through the ATCM buyer for approval by the ATCM Supplier Quality Manager.

Suppliers shall maintain traceability records, appropriate to the products delivered, that provide traceability from delivered products through manufacturing to the raw materials. Traceability records shall be made available to ATCM upon request.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 6 of 8
-----------------------------	--------------------------------------	------------------------------------	------------------------------

Suppliers do not have MRB authority for ATCM or any of its customer's designed items. Suppliers have MRB authority for those items that are of supplier design and are not unique to ATCM, unless otherwise restricted by the purchase order or for those nonconformance's that affect areas controlled by the ATCM's Engineering drawing or specification. This includes areas of form, fit function, weight, interchangeability, maintainability, reliability, safety or unique key characteristics. Dispositions of "Use As Is" or repair may be used as long as the nonconformity does not result in a departure from the requirements of the supplier's controlled drawing or specification. Material Review Board authority will not be granted to suppliers who do not have design and/or design control capabilities as defined in ISO9001: 2000/ AS9100, Section 7.0., Product Realization. ATCM and its Customer retains the right to not accept Supplier MRB dispositions or product that has had said dispositions incorporated.

Suppliers shall provide a First Article Inspection Report in accordance with the latest released revision of SAE-AS9102 with the first delivery of product and with each subsequent revision to the ATCM design configuration.

Suppliers shall provide the following documentation with each product delivery, as applicable:

- Certificate of Conformance (C of C) certifying that materials, parts, assemblies and/or related purchase order "Data Items" have been approved and all components of a deliverable item have been inspected and/or tested to applicable Acceptance Test Procedures (ATP) and/or specification/control drawings. The C of C may be a separate document or included on the packing sheet. The supplier's Quality management or designee must sign and/or stamp this document.
- Lot Inspection Verification Record traceable to the products delivered and documenting conformance to all criteria, including drawing notes, of the ATCM specification/control drawing.
- Material and Process Certifications in accordance with the latest released revision of ATCM Standard Operating Practice SOP 06-003.
- Copies of ATCM approved Nonconformance Reports.

Suppliers shall provide timely reporting of nonconformities determined to affect previously delivered product to the ATCM buyer, including any continuing airworthiness actions. Notification shall include:

- a clear description of the discrepancy,
- identification of all suspect parts (to include mfg. dates, serial numbers, quantities, etc.) and material affected by the deficiency,
- date'(s) delivered,
- any information relating to the Root Cause / Corrective Action steps initiated to address the defective condition,
- preventive measures taken to preclude recurrence of the process failure, and

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 7 of 8
-----------------------------	--------------------------------------	------------------------------------	------------------------------

- a technical assessment and recommended disposition.

Modifications of a disclosure (additions or deletions of data) requiring subsequent issuances shall be revision controlled to provide definitive sequencing (i.e. Rev 'A', 'B' etc.).

11.0 MANUFACTURING PROCESS CONTROL

Manufacturing process controls shall be developed, implemented and maintained in accordance with the latest revision of ATCM procedure QC-09, Process Control. Manufacturing inspection and testing shall be in accordance with the latest revision of ATCM procedure QC-10, Inspection and Testing.

First Article Inspection shall be completed on all cast, machined and/or fabricated detail parts in accordance with the latest released revision of SAE-AS9102 requirements.

Records of all manufacturing shall be maintained and shall be traceable from raw materials to the completed components, including any rework and/or detail part replacement that may have been performed during the manufacturing process.

12.0 CONTROL OF MONITORING AND MEASURING DEVICES

Measurement and test equipment is periodically checked in accordance with Specifications Measurement Instruments Calibration Intervals and Organization of Metrology Laboratory and General Measurement Instruments and Equipment Calibration System. Control of Inspection, Measuring, and Test Equipment shall be in accordance with QC-11.

The QPP provides for specific requirements for test equipment that shall be adhered to. Program Quality Engineering shall assure compliance to these requirements during test setup verifications.

13.0 CONTROL OF NONCONFORMING PRODUCT

Any deviation (nonconformance), identified in assemblies, sub-assemblies, and component/detail parts shall be evaluated, documented, and disposition in compliance with Control of Nonconforming Product (QC-13).

ATCM does not have MRB authority from Northrop Grumman or any of its customer's designed items. ATCM maintains MRB authority for those items that are of ATCM design and are not unique to Northrop Grumman, unless those nonconformance's affect engineering or specification criteria controlled or approved by Northrop Grumman. This includes areas of form, fit function, weight, interchangeability, maintainability, reliability, safety or unique key characteristics. Dispositions of "Use As Is" or repair may be used as long as the nonconformity does not result in a departure from the requirements of the ATCM's controlled drawing or specification. Northrop Grumman/Customer retains the right to not accept ATCM MRB dispositions or product that has had said dispositions incorporated.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number 8 of 8
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14.0 PART MARKING REQUIREMENTS

All deliverable products shall be identified and serialized in accordance with the latest revision of ATCM procedure QC-08, Identification and Traceability unless otherwise specified by the engineering drawing.

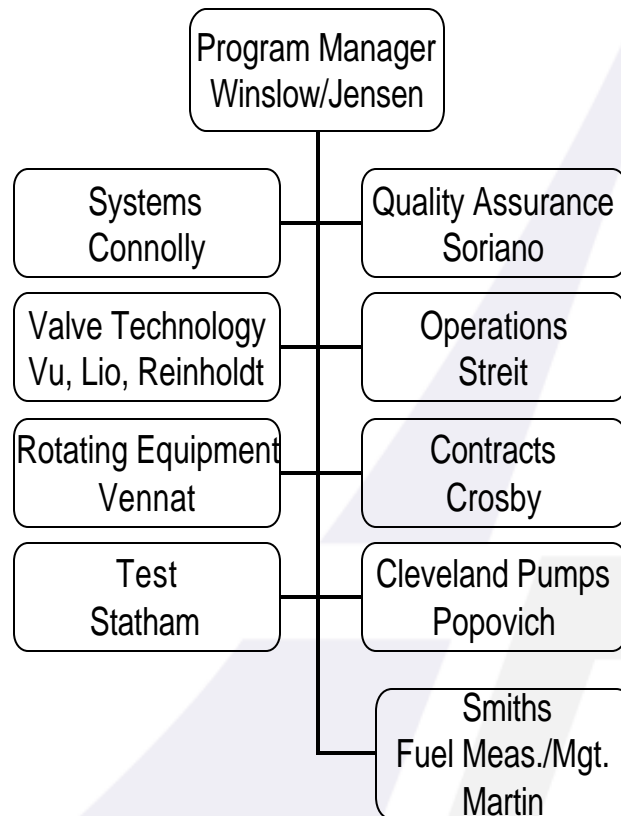
15.0 SHIPPING DOCUMENT REQUIREMENTS

The following documents shall be shipped with all deliveries:

- Certificate of Conformance (C of C) certifying that materials, parts, assemblies and/or related "Data Items" have been approved and all components of a deliverable item have been inspected and/or tested to applicable Acceptance Test Procedures (ATP) and/or specification/control drawings. The C of C may be a separate document or included on the packing sheet. ATCM Quality management or designee must sign and/or stamp this document.
- Acceptance Test Reports providing the record of acceptance test results traceable to delivered components.

Number SOP 21-009	Effective Date 1 JULY 2005	Revises Policy Dated N/A	Page Number Addendum I
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X-47 J-UCAS Program Organization Chart



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June 10, 2005