

Appendix QX

Supplier Quality Requirements

REVISION RECORD

The latest issue to this document is the version that is available on the Lockheed Martin Aero website:
<http://www.lockheedmartin.com/material-management>.

Revision	Date	Changes
Original Issue	03/28/2002	Completely revised / replaced QR to separate and clarify Program, Commodity, and General application of Quality Requirements based on Program application. This serves as a “pilot” version for other procurements. Adds Revision Record, Table of Contents, and Tables to enable supplier to identify the LM Program and understand which quality system and quality requirements apply based on his product (commodity) type.
Revision A	5/31/2002	Added definition of “Item or Items” in Document Overview paragraph; clarified First Article Inspection (FAI) requirements in paragraphs 2.3.1, 3.3, & 3.4; added the words “as applicable” to paragraph 2.3.6.1.8
Revision 2	8/11/2003	Changed revision scheme to numbers to align with LM AeroCode guidelines. Removed references to all other Programs to dedicate QX to F-35 JSF suppliers only. Added COTS to Table 2. Added Service Providers to Table 1. Added Test Items to Table 1 and incorporate self-deleting requirements for Test Items. Refined Deliverable Software requirements in Table 1. Enhanced FAI requirements in Para. 3.3 to include instructions for FAI in 3D Model Environment. Incorporated tooling quality requirements. Added Para. 3.5.4 prohibiting use of freeware, shareware, etc. without IPT approval. Aligned NCM control & QCS-001 sections with Appendix QR changes. Added F-35 JSF Critical Part categories to Para. 4.13. Added additional calibration references to Para. 4.19. Renumbered paragraphs and tables to align with changes. Updated web links to coincide with new websites.
Revision 3	2/13/2006	Removed references which limited the entire Appendix QX to F-35 (JSF) suppliers only – Appendix QX replaces Appendix QR in its entirety. Major re-alignment of paragraphs to enhance flow of quality requirements. Revised tables to include industry standards and program specific requirements. Added AS9100 requirement for F-35 (by 1 Jan 2010) and AS9120 for Distributors (by 1 Jan 2008). Added Service Centers to listing of “Commodity/Product” in Table 1. Re-worded and re-named section on “Selection, Control and Contract Flow Down to Quality Control Specification (QCS)-001 Sources” to flow requirements of Appendix QJ, where applicable.

TABLE OF CONTENTS

TITLE	PAGE
Revision Record	1
Table of Contents	2
1.0 Quality Requirements	2
1.1 Quality System Changes	3
1.2 Language	3
1.3 Reference Documents	3
1.4 Supplier Control	3
1.5 Outsourcing Critical Items	3
1.6 Certificate of Conformance	3
1.7 Records	3
1.8 Notification	3
1.9 Certified Materials	3
1.10 Calibration	4
1.11 Tooling as a Media of Inspection	4
1.12 Interchangeable Replaceable Program Requirements	4
1.13 Buyer-Furnished, Seller-Manufactured, or Seller-Owned Tooling	4
Table 1 – Quality System Requirements by Commodity	5
Table 2 – Unique/Limited System Suppliers	6
2.0 Point of Acceptance	6
2.1 Facility Access	7
2.2 Sampling	7
2.3 Control & Processing Nonconforming Material & Corrective Action	7
2.4 Material Review Authority for Seller-Designed Items	8
2.5 Material Review Authority for Buyer-Designed Items	8
2.6 Material Review Board Submittals	9
2.7 QCS-001 Requirements for Buyer-Designed Items	9
2.8 QCS-001 Requirements for Seller-Designed Items	9
2.9 Condition of Supply (F-35 ONLY)	9
2.10 Conformance Verification (F-35 ONLY)	10

The terms “Item(s)”, “PO”, “Seller”, and “Buyer” as used herein, have the same meaning as the terms “Work”, “Contract”, “SELLER”, and “LOCKHEED MARTIN”, respectively.

Questions regarding this Appendix QX or the applicability of this Appendix QX should be addressed to Buyer’s Material Management representative who administers this PO. In order to be regarded as a formal response, a copy of any written correspondence related to the requirements of this Appendix QX must have written concurrence by Buyer’s Procurement Quality Assurance (PQA) and shall be provided to Buyer’s PQA Representative servicing Seller’s facility and / or PQA management. Contact information for PQA is located at <http://www.lockheedmartin.com/material-management>.

1.0 Quality Requirements: Seller shall meet the requirements in Tables 1 or 2, as applicable, and the requirements of this Appendix QX. Seller shall also meet all quality requirements identified elsewhere in this PO. Seller shall ensure all applicable quality requirements are imposed upon sub-tier suppliers or manufacturing facilities. Seller shall have Internet access for obtaining requirements of this PO. All applicable flow down requirements listed in Tables 1 and 2 shall be to the latest revision in effect as of the date of this PO.

- 1.1 Quality System Changes:** Seller shall notify Buyer, in writing, of any adverse change in its quality system status resulting in the loss of 3rd Party registrar's certification status, or any action taken by Seller's customer, the Government, Federal Aviation Agency (FAA) or Civil Aviation Agency (CAA). Seller shall also notify Buyer upon any sale, relocation or transfer of Seller's manufacturing operations or upon any change in the quality organization, process or procedures that could affect conformity verification of Items. Notification by Seller shall be made within 30 days of such changes.
- 1.2 Language:** Unless otherwise authorized by Buyer in writing, all records, reports, specifications, drawings and other documentation shall be in English.
- 1.3 Reference Documents:** Buyer unique documents (e.g., Q2A, Q30, TMS-MC-015, etc.) referenced in this PO may be obtained from Buyer's Material Management representative or Buyer's website at: <http://www.lockheedmartin.com/material-management>. Copies of Aerospace Standards (AS/EN documents) may be obtained from the Society of Automotive Engineers at: www.sae.org.
- 1.4 Supplier Control:** Seller is responsible for ensuring all Items procured from its suppliers for this PO conform to all requirements of this PO.

 - 1.4.1** Seller's documented quality system shall include procedures for determining the capability of sub-tier suppliers, prior to issuance of Seller's PO to any such sub-tier supplier.
- 1.5 Outsourcing of Critical Items:** Seller shall notify Buyer, in writing, when any Key Characteristic (KC), Interchangeable-Replaceable features, Fracture Critical features, Durability Critical features, Maintenance Critical features, Safety Critical features, Mission Abort Critical features, or changes affecting fit, form or function are to be subcontracted.
- 1.6 Certificate of Conformance:** Seller shall prepare a Certificate of Conformance ("CoC") asserting that the Items contained within this shipment are in total compliance with the requirements of this PO. Items provided under this PO must meet all applicable requirements. Any exceptions shall be annotated in the delivery package. A copy of the CoC shall be included with Seller's product shipper.
- 1.7 Records:** Seller shall maintain complete records of all manufacturing, process capability (if applicable), inspection and test, including copy of CoC. Seller shall make records available to Buyer, upon request, for at least three (3) years after completion of this PO and for longer periods as may be specified elsewhere in this PO. Upon request, Seller shall forward specific records to Buyer at no additional cost, price, or fee to Buyer. For at least seven (7) years after completion of this PO, Seller shall maintain and provide to Buyer upon request, records of all QCS-001 process control tests performed by Seller, and inspection records of processed Items.
- 1.8 Notification:** Seller shall notify Buyer when:

 - Seller or Seller's sub-tiers are found to be non-compliant to Buyer specifications,
 - Seller's sub-tier is disapproved by Seller,
 - Seller or Seller's sub-tiers are disapproved by a Government Agency, or
 - Government/Industry Data Exchange Program ("GIDEP") Alert is required or received affecting Buyer Items.
- 1.9 Certified Materials:** Seller shall establish controls to prevent the use of non-certified materials when certified materials are required.

- 1.10 Calibration:** Seller shall maintain a documented calibration system for the calibration and maintenance of tools, jigs, inspection and test equipment. Seller's calibration system shall be compliant to prevailing industry requirements in accordance with Seller's Quality Management System ("QMS"), including without limitation ISO 17025, ISO10012-1, ANSI Z540.
- 1.11 Tooling as a Media of Acceptance:** Seller shall utilize mandatory/required tooling provided by Buyer and designated as "Production Type" tooling to be utilized for Item manufacture as Seller's media of inspection and for Buyer Source Acceptance for those part features created by, or depicted by, such tooling, e.g., contours, hole locations, and profiles.
- 1.12 Interchangeable Replaceable Program Requirements:** Seller shall comply with Interchangeable Replaceable (I/R) requirements specified in the PO and Tooling Manual (TMS-MC-015), Appendix A, C, and G.
- 1.12.1 F-16 Program** – Seller shall conduct I/R demonstrations in accordance with the requirements of 16PP026 for those parts listed in 16PR100.
- 1.12.2 F-22 Program** – Seller shall conduct I/R demonstrations in accordance with the requirements of 5PD00753C and 5PD00040.
- 1.13 Buyer-Furnished, Seller-Manufactured or Seller-Owned Tooling:** Seller's documented quality system shall include written procedures for the control, maintenance, and calibration of special tooling, jigs, inspection and test equipment, and other devices used in manufacturing processes.
- 1.13.1 Buyer Furnished Tooling:** Seller shall comply with the requirements of Tooling Manual (TMS-MC-015) concerning Buyer-furnished controlled tooling, tooling tools, and production tools.
- 1.13.2 Seller-Manufactured Tooling:** Where Seller manufactures tooling for Buyer-Designed Items, Seller shall comply with the requirements of Tooling Manual (TMS-MC-015) concerning Seller-manufactured tooling that is identified as a non-recurring cost in this PO.
- 1.13.3 Seller-Owned Tooling:** Seller shall comply with the requirements of Tooling Manual (TMS-MC-015) concerning Seller-owned tooling used in the production of product for this PO.

TABLE 1 – Quality System Requirements by Commodity

Commodity / Product	Quality Management Systems			Fit Check	Software	FAI	FOD	Measurement Plan	Variability Reduction
	QMS See Note 1	AS / EN 91000 (F-35) See Note 3	ISO9001: 2000 (F-35 or Service Centers)	Q3R (F-16 and C-130 only)	Q6R	AS/EN 9102 (Q2A)	Q4R	Q30 (F-35)	AS/EN9103 (F-35)
LM Aero Build-to-Print Metallic and Non-Metallic Parts, Castings & Forgings (including finished castings and forgings), Sheet Metal, Machined Parts, Structural Assemblies/Details, Honeycomb Core, Composite Parts	X	X		X	X	X	X	X	X
Metallic Raw Materials (Bar, Rod, Plate, Sheet, Extrusions, etc.), including Cut-to-Size	X								
Non-Metallic Raw Materials (Chemicals, Paints, Adhesives, Lubricants, Tapes), Composite Materials	X						X		
Electrical Hardware/Components, Mil-Spec Standard Hardware, LM Aero Special Hardware, or Miscellaneous Hardware and Bearing, Detail Parts Controlled Under Manufacturer's Part Number, Support Equipment (SE) and Details of SE	X					See Note 5	X		
Ground Support Equipment	X						X		
Electrical, Mechanical, Avionics (equipment, assemblies, sub-assemblies, details, and major components), including jet engines and propellers	X	X			X	X	X		X
Aviation Fuel/Oil	X						X		
Perishable Tooling	X								
Tooling	X	X					X		
Electrical Harnesses	X	X				X	X		X
Software	X	X			See Note 4				
Service Providers (See Note 2)	X		X		X		X		
Service Centers (See Note 6)			X						
Engineering Test Units, Brass Boards, Lab-Use-Units, Non-Production Hardware	X	X			X				

NOTES – TABLE 1

- (1) Legacy programs: Seller shall maintain an ISO, AS or Military Standard equivalent quality system acceptable to Buyer. Legacy programs are all programs except F-35 (JSF). Third party registration ISO/AS/EN Quality Management Systems (QMS) from an ANSI-ASQ National Accreditation Board (www.anab.org) approved registrar is preferred.
- (2) Supply Service Providers - A company whose specialty and core business is integration and management of supply chain operations. Services may include, without limitation, kitting, transportation, distribution & warehouse management, inventory management tasks such as tactical inventory forecasting and optimization, supplier management for selected classes of supplies, and global material deployment and distribution.
- (3) Commodities requiring an AS/EN9100 QMS must be compliant no later than 1 January 2010. Until that date, Seller, at a minimum, shall meet the requirements of ISO 9001:2000.
- (4) Seller’s quality clause Q6R applies to both deliverable and non-deliverable software.
- (5) F-35 program specific Items may be eligible for exclusion from First Article Inspection (FAI) requirements per quality clause Q2A. To determine exclusions to Quality Clause Q2A First Article Inspection requirements, access the standard hardware database (ASPECT) and the resulting document, 2GNA00001 – Approved Manufacturer List for Standard Parts, found on the F-35 JSF Data Library.
- (6) Service Centers each act on behalf of Buyer as a Licensee. Licensee may provide spare(s) Item(s) or perform repair and/or rework of Buyer Items.

TABLE 2 – Unique / Limited Quality System Suppliers

Commodity / Product	QMS (See Note 1)	AS/EN9120 (See Note 3)	FAI AS/EN9102 Q2A
Distributors (1 and 3)	X	X	
Commercial Items or Commercial Off the Shelf Items (COTS) (1 and 2)	X		

NOTES – TABLE 2

- (1) Seller shall maintain an ISO, AS/EN or Military Standard equivalent quality system acceptable to Buyer.
- (2) Commercial Item or Commercial-Off-The-Shelf (COTS) - Any Item currently listed in a Manufacturer's or Distributor's catalog with an established part number. Only the published catalog number and description is used to purchase. Seller defines the product performance, engineering specifications, reliability, industry certification and operational environments.
- (3) Distributors must be compliant to AS9120 no later than 1 January 2008. “Distributor” is defined as any Seller that is buying Items from other suppliers and selling them to Buyer without adding value to the item. Repackaging shall not be considered a value-added task for the purpose of this definition.

2.0 **Point of Acceptance:** The point of acceptance is indicated on each PO issued. The Point of Contact for Buyer Procurement Quality Assurance Representatives (PQARs) can be found at: <http://www.lockheedmartin.com/material-management> > Quality Requirements > Information. Seller is responsible for ensuring all requirements of this PO have been met. Buyer shall have the right to conduct surveillance and/or audits at any time, without increase in price, cost or fee to Buyer.

- Items designated “Buyer Accept at Source” shall be subject to final acceptance by Buyer’s PQAR at Seller’s facility prior to shipment.
- Items designated “Buyer and Government Accept at Source” shall be subject to acceptance by Buyer’s PQAR and the assigned Government Representative at Seller’s facility prior to shipment.

- Items designated “Seller at Source” shall be subject to acceptance by Seller’s quality assurance representative prior to shipping. Should Seller’s performance result in a change to the point of acceptance to “Buyer at Source”, Seller shall be subject to costs associated with the added task.
- Items designated “Purchase Order Administrator/User” are not subject to acceptance by PQAR.

2.0.1 – When this PO calls for “Buyer Accept” or “Buyer and Government Accept at Source” Seller, not less than five (5) days after receipt of this PO, shall notify Buyer’s PQAR who normally services Seller’s facility, unless Seller has received written authorization per 2.0.4. The notification shall include PO number, date of scheduled shipment and any special security clearance required to perform Buyer activities. If Seller does not know Buyer PQAR assigned to this facility, Seller may request this information from Buyer.

2.0.2 – When this PO calls for “Buyer Accept at Source”, Seller shall notify Buyer’s PQAR not less than 48 hours prior to Items being ready for shipment, unless Seller has received written authorization per 2.0.4.

2.0.3 – Seller shall not claim entitlement to an increase in the PO price, cost, or fee based upon an assertion that “Buyer Accept” or “Buyer and Government Accept at Source” imposes additional cost(s) or task(s) on Seller.

2.0.4 - If Seller has received Buyer’s authorization to accept Items on behalf of Buyer, any such acceptance shall be in accordance with Buyer’s authorization.

2.0.5 - Work under this PO is subject to Buyer's periodic surveillance/audit of Seller's compliance with Seller’s internal procedures and other documents applicable to this PO.

2.1 **Facility Access:** Seller shall provide or obtain for Buyer, Buyer’s Customers and regulatory agency personnel, access to any and all facilities, including those facilities of Seller’s subcontractors, where work is being performed or is scheduled to be performed. Buyer shall have the right to perform in-process inspections, audits or system surveillance at Seller’s and Seller’s subcontractors’ facilities as part of verification of conformance to the requirements of this PO. Denial of any such access may result in inactivation of Seller’s approval. Seller shall include the provisions of this facility access requirement in its POs with its subcontractors.

2.1.1 - Seller shall provide, at no increase in price, cost or fee to Buyer, Government or appropriate regulatory agencies, suitable facilities at Seller and Seller’s subcontractors’ manufacturing locations for Buyer, Government, and regulatory agency representatives to perform compliance verification.

2.1.2 - Seller shall provide Buyer’s Field Representative with internet access via one of the following methods:

- Direct Non-Digital telephone line
- ISDN line
- DSL Line
- High-Speed Internet Access via Seller’s Network

2.2 **Sampling:** Seller may use sampling plans, provided the sampling plans are in accordance with existing military or Government standards, or have been approved by Buyer in writing.

2.3 **Control and Processing Nonconforming Material and Corrective Action:**

2.3.1 - Seller shall implement and maintain a documented quality system that provides for identification,

documentation, segregation and disposition of nonconforming material. Seller shall ensure effective corrective action is taken (including repetitive nonconformances dispositioned "Use-As-Is" by Buyer's or Seller's Material Review Board ("MRB") actions) to prevent, minimize, or eliminate nonconformances. Seller's QMS shall ensure that non-conforming material is not used for production purposes.

2.3.2 - Seller shall maintain records of all nonconforming material, dispositions, assignable causes, corrective actions, and effectiveness of corrective actions for the period specified in this PO.

2.3.3 - Seller shall evaluate each nonconformance for its potential to exist in previously produced or delivered Items. If a nonconformance exists, Seller shall notify Buyer, in writing, within 24 hours for issues impacting flight safety, and, in writing, within 5 working days for all other issues.

2.3.4 - Seller shall respond to all Buyer requests for corrective action. When requested by Buyer, Seller shall provide trend data and findings for Buyer returned Items.

2.3.5 - Seller shall assess all Buyer identified nonconformances, whether or not Item(s) was/were returned to Seller, and take appropriate actions to ensure causes of nonconformance are corrected. Seller shall notify Buyer of actions taken to prevent recurrence by completing Supplier Confirmation/Action Report (SCAR) for all Buyer identified nonconformances. The SCAR form can be obtained at: <http://www.lockheedmartin.com/material-management> > Quality Requirements > Forms.

2.3.6 - Seller shall submit SCAR to assigned Procurement Quality Assurance Engineer (PQAE) within 30 days of Preliminary Notification of Nonconformance (via e-mail).

2.3.7 - Seller shall record component removal/replacement data for all functional Items returned by Buyer on the SCAR.

2.4 **Material Review Authority for Seller-Designed Items:**

2.4.1 - Seller has Material Review Authority (MRA), except for nonconformances that affect a parameter controlled by Buyer drawing or specification, where form, fit or function, interchangeability, service life or reliability is affected. Seller shall submit dispositions of nonconformances, if any, affecting any such parameter(s) to Buyer for approval.

2.4.2 - Buyer has the right to remove MRA if Seller demonstrates abuse of the MRA process.

2.5 **Material Review Authority for Buyer-Designed Items:**

2.5.1 - Seller disposition authority is limited to scrapping of Items, eliminating the nonconformance by rework to engineering, or returning to vendor. On Items of Buyer design, Seller shall document nonconformances for submittal to Buyer's MRB for dispositions as required by this PO. Seller's continued processing, prior to Buyer's MRB disposition, of any Buyer-designed Items containing a nonconformance prior to Buyer's MRB disposition will be at Seller's risk.

2.5.2 - If Buyer has delegated MRA to Seller on Buyer-designed Items, Seller shall exercise such MRA except for nonconformances of a parameter that affects form, fit, function, interchangeability, service life or reliability.

2.5.3 - Seller shall submit requests for MRA on Buyer-designed Items in writing to Buyer.

2.6 **Material Review Board Submittals:**

2.6.1 - Seller's request for Buyer MRB disposition of Seller or Buyer-designed Items shall be submitted in accordance with Buyer instructions located at:

<http://www.lockheedmartin.com/material-management> > Quality Requirements > Corrective Action.

2.6.2 - Seller shall not incorporate any nonconformances into any Item, process, procedure or data that affects a parameter controlled by Buyer drawing or specification or affects form, fit or function, interchangeability, service life or reliability unless and until Seller has received prior written approval from Buyer to do so.

2.6.3 - Buyer and Buyer's customers shall each have the right to refuse to accept any nonconformances. When Government Source Inspection is a requirement of this PO, and Buyer's customer has delegated MRA to Seller's cognizant Government source representatives, Seller shall submit material review dispositions to Seller's local Government representative for concurrence.

2.6.4 - Prior to delivering Items that have Buyer MRB dispositions, Seller shall ensure that root cause analysis and corrective action plans for all discrepancies have been completed. Seller shall submit corrective action plans to Buyer or Buyer's Representative with final acceptance paperwork.

2.7 **OCS-001 Requirements for Buyer-Designed Items:**

2.7.1 - QCS-001 sets forth both the process sources and the processes that require Buyer approval, prior to use for Items delivered to Buyer. A controlled process is an operation performed on an Item where the operation cannot be readily verified subsequent to its conclusion. Controlled processes have verifiable controls inherent to the process, e.g. heat treat, plating, nondestructive testing, etc.

2.7.2 - Seller and Seller's sub-tiers shall meet all requirements of Appendix QJ when Seller or Seller's sub-tiers are performing Buyer-controlled processes identified in QCS-001.

2.8 **OCS-001 Requirements for Seller-Designed Items:**

2.8.1 - Seller has the authority and responsibility to approve and control its own processing sources, including in-house processes.

2.8.2 - Buyer shall have the right to review and maintain surveillance of Seller's system for approval and control of Buyer-approved processes listed in QCS-001, including those performed in-house. If Buyer determines Seller's system has failed to control processing or testing, Buyer shall have the right to withdraw Seller's authority to approve and control Buyer-approved processes listed in QCS-001. In the event of withdrawal of such authority, Buyer shall have the right to direct Seller, at no increase in price, cost or fee to Buyer, to use Buyer-approved sources listed in QCS-001 and meet the requirements of Appendix QJ.

2.8.3 - Seller's design shall incorporate Buyer's Source Control Drawings or Specification Control Drawings, as the case may be.

2.9 **Condition of Supply (Applicable to F-35 JSF ONLY):** Seller shall comply with the Condition of Supply requirements to be developed by Seller and Buyer Integrated Product Team (IPT), as deemed necessary by the IPT installing/integrating the product (Receiving IPT), at no increase in price, cost, or fee to this PO and at no change in delivery schedule.

The Condition of Supply document ensures the Receiver and Seller have a common understanding of the manufacturing process. The Condition of Supply document shall be owned by the Receiving IPT

and agreed upon with Seller responsible for the Item. Condition of Supply document shall define and document the special manufacturing, testing, and/or certification instructions to be achieved prior to delivery of Item(s), (e.g. Forward Fuselage, Wing, Center, Aft Fuselage, etc.), Line Replaceable Components (LRC), systems/system build software, harness assemblies, and minor airframe components, (e.g. panels, doors, etc.).

2.10 **Conformance Verification for Engineering Test Units, Engineering Brass Boards, Lab-Use-Units or Non-Production Configuration Hardware (Applicable to F-35 JSF ONLY):** Variation Management of Key Characteristics (AS/EN9103) and First Article Inspection (AS/EN9102) are not required for the Items. Prior to shipping such Items, Seller shall perform the following:

- Verify correct detail parts are installed via parts list analysis
- Verify correct product marking
- Verify envelope dimensions
- Document the verification to this level only as a matter of record (not an FAI documentation)
- Verify operation performance per the current Acceptance Test Procedure (ATP), as applicable
- Verify performance against respective Performance Base Specification (PBS), or Statement of Work (SOW), as applicable
- Obtain Buyer acceptance of Items as indicated on this PO