

## 60XX QUALITY/QUALITY SYSTEMS

### 6001 STATISTICAL PROCESS CONTROL

Seller shall create a statistical process control plan, stating the details of the techniques to be used on both dimensions and processes for the hardware delivered under this PO/Contract. The plan must be submitted to the MDC Purchasing Representative for approval by MDC Quality Assurance.

### 6002 INTERCHANGEABILITY AND REPLACEABILITY

#### 1. GENERAL

The Seller is responsible for the interchangeability and replaceability requirements specified herein for items designated as "interchangeable" or "replaceable" when specified by drawing or as specified by terms of the contract. Seller shall submit an interchangeability and replaceability plan with a schedule for approval, per the requirements of MIL-I-8500D interchangeability and replaceability of component parts for aerospace vehicles.

#### 2. DEFINITIONS

**Interchangeable-** Components are considered interchangeable when they are interchangeable structurally, physically (for mating) and functionally (for serving exactly the same purpose without affecting functional values). Interchangeable components shall be capable of being readily installed or removed without modification of the component or mating structure. Installation or removal of an interchangeable component shall require only the installation or removal of attaching means (bolts, nuts, screws, pins, etc.). No fabrication operations (such as cutting, filing, drilling, reaming) or hammering, bending, prying or forcing shall be required for installation or removal.

**Replaceable-** Components are considered replaceable when they meet all requirements of interchangeability except that the installation of such components may require work or operations in addition to installation of the attaching means. Such operations may include drilling, reaming, filing, trimming or other operations necessary for installation of the component into the mating assembly. Such operations do not include shearing, bending, forming, or other basic operations which cannot be readily performed with ordinary hand tools.

**First Article-** A First Article Component is the first component(s) exhibiting the required interchangeable/replaceable characteristics and has all controlled characteristics completed to the appropriate tool or jig, i.e., trimmed net, fully drilled, etc.

**First Article Demonstration-** A First Article demonstration of interchangeability consists of the successful installation and subsequent removal of one (1) First Article component on two (2) major assemblies, or the successful installation and subsequent removal of two (2) First Article components on one (1) major assembly. In-plant Demonstrations are not required for replaceable components; the normal assembly of one (1) replaceable component into one (1) major assembly shall be considered sufficient proof of replaceability.

**Conformance Demonstration-** Conformance Demonstrations are repetitive checks at prescribed intervals consisting of the same requirements as for a First Article demonstration performed for items produced subsequent to a successful First Article demonstration.

#### 3. REQUIREMENTS

- a. The Seller shall perform a First Article Demonstration at the specified effectively. Demonstrations not accomplished at the required effectively will not be held in abeyance without the approval of the Quality Organization of the cognizant MDC Component Company unless: acceptable tooling is not available; the component to be demonstrated is a "shortage item"; and/or mating structure required for checking gap, mismatch and spline is not installed because of "shortages". When a First Article Demonstration is held in abeyance because of the aforementioned reasons, the appropriate reason must be documented on interchangeability records, approved by Seller Quality Assurance and submitted to MDC personnel upon request. First Article Demonstrations not accomplished for reasons other than the aforementioned will be brought to the immediate attention of the Quality Organization of the cognizant MDC Component Company.
- b. Units to be conformance demonstrated will be randomly selected by Seller Quality Assurance within the frequency for demonstration established by the contract. Failure of a conformance demonstration to meet interchangeability requirements shall cause all units not checked subsequent to the previous successful demonstration cycle to be demonstrated.

- c. First Article Demonstrations will be witnessed and approved by the MDC Quality Assurance Representative and the customer when same are in residence at the Seller's facility or by arrangement with the Quality Organization of the cognizant MDC Component Company.
- d. The Component shall prepare and submit the Interchangeability Record in accordance with the format as prescribed in Form DAC 2-160.

**6003** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX A, "QUALITY MANAGEMENT SYSTEM", AND ADDENDUM 1, "ADVANCED QUALITY SYSTEM FOR PRODUCT AND PROCESS IMPROVEMENT", AND ADDENDUM 2, "QUALITY SYSTEM REQUIREMENTS FOR DELIVERABLE SOFTWARE"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix A, and Addendum 1 and Addendum 2 to such document as each may be amended from time to time. Such document, Appendix and Addenda are incorporated herein and made a part hereof by this reference. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of Boeing Document D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda can be obtained at the following URL address: <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6004** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX A, "QUALITY MANAGEMENT SYSTEM", AND ADDENDUM 1, "ADVANCED QUALITY SYSTEM FOR PRODUCT AND PROCESS IMPROVEMENT"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix A and Addendum 1 to such document as each may be amended from time to time. Such document, Appendix and Addendum is incorporated herein and made a part hereof by this reference. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda, can be obtained at the following URL address: <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6005** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX A, "QUALITY MANAGEMENT SYSTEM", AND ADDENDUM 2, "QUALITY SYSTEM REQUIREMENTS FOR DELIVERABLE SOFTWARE"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix A, and Addendum 2 to such document as each may be amended from time to time. Such document, Appendix and Addendum is incorporated herein and made a part hereof by this reference. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of Boeing Document D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda can be obtained at the following URL address: <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6006** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX A, "QUALITY MANAGEMENT SYSTEM"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix A, to such document as each may be amended from time to time. Such document, and Appendix is incorporated herein and made a part hereof by this reference.. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of Boeing Document D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda can be obtained at the following URL address: <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6007** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX B, "INSPECTION AND TEST QUALITY SYSTEM", AND ADDENDUM 1, "ADVANCED QUALITY SYSTEM FOR PRODUCT AND PROCESS IMPROVEMENT"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix B and Addendum 1 to such document as each may be amended from time to time. Such document, Appendix and Addendum is incorporated herein and made a part

hereof by this reference. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda, can be obtained at the following URL address <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6008** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS APPENDIX B, "INSPECTION AND TEST QUALITY SYSTEM"

Seller is required to maintain a Quality System in compliance with the Boeing Document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers", Appendix B to such document as each may be amended from time to time. Such document, and Appendix is incorporated herein and made a part hereof by this reference. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality System meets the requirements as set forth herein. A copy of D6-82479, "BQMS Requirements for Suppliers", including all appendices and addenda, can be obtained at the following URL address <http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6009** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS: APPENDIX A, AS9100, QUALITY MANAGEMENT SYSTEMS - AEROSPACE - REQUIREMENTS - NON-FAA REGULATED MAINTENANCE, REPAIR AND OVERHAUL SERVICES

Seller is required to maintain a quality system in compliance with Buyer's document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers" and Appendix A to such document as each may be amended from time to time. Such document and appendix are incorporated herein and made a part hereof by this reference. Seller's AS/EN/JISQ9100 certification shall have an associated certification body assessment report/package that contains evidence that service provisions were assessed.

Buyer reserves the right to conduct surveillance at Seller's facility to make final determination that Seller's quality system meets the requirements as set forth herein.

Copy of Buyer's document D6-82479, BQMS Requirements for Suppliers, including all appendices and addenda can be obtained at the following URL:

<http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6010** SELLER'S STATEMENT OF CORRECTIVE ACTION

Upon request from MDC, Seller shall complete "Supplier Corrective Action Notice" (SCAN) (Form DAC 2-683) and return by mail to the address that appears on the form, within the period specified on the SCAN. When requesting a reversal of responsibility from MDC, Seller shall supply to the MDC Purchasing Representative the reason and documentation as to why the nonconformance was not Seller's fault.

Note: Corrective Action Statement shall be furnished at no additional cost to MDC.

**6011** BOEING QUALITY MANAGEMENT SYSTEM (BQMS) REQUIREMENTS: APPENDIX C, AS9110, QUALITY MAINTENANCE SYSTEMS - AEROSPACE - REQUIREMENTS FOR MAINTENANCE ORGANIZATION:

Seller is required to maintain a quality system in compliance with Buyer's document D6-82479, "Boeing Quality Management System (BQMS) Requirements for Suppliers" and Appendix C to such document as each may be amended from time to time. Such document and appendix are incorporated herein and made a part hereof by this reference.

Buyer reserves the right to conduct surveillance at Seller's facility to make final determination that Seller's quality system meets the requirements as set forth herein.

Copy of Buyer's document D6-82479, BQMS Requirements for Suppliers, including all appendices and addenda can be obtained at the following URL:

<http://www.boeing.com/companyoffices/doingbiz/supplier/>

**6010** SELLER'S STATEMENT OF CORRECTIVE ACTION

Upon request from MDC, Seller shall complete "Supplier Corrective Action Notice" (SCAN) (Form DAC 2-683) and return by mail to the address that appears on the form, within the period specified on the SCAN. When requesting a reversal of responsibility from MDC, Seller shall supply to the MDC Purchasing Representative the reason and documentation as to why the nonconformance was not Seller's fault.

Note: Corrective Action Statement shall be furnished at no additional cost to MDC.

**6012** SELLER NONCONFORMANCE RESPONSIBILITY

Seller has been determined to be responsible for the nonconformances found in the parts listed on the Rejection Purchase Order. This nonconformance history will become part of the Supplier Rating System (SRS) concerning your company. If your company disagrees with this determination, notify the MDC Purchasing Representative within thirty (30) days. Failure to reply will be considered as confirmation of this determination.

**6050** SELLER NONCONFORMING PRODUCT MATERIAL REVIEW AUTHORITY

1. Seller is hereby granted authority to accept nonconforming product with or without repair, without customer (MDC) concession.
2. When product is found to depart from requirements, they shall be identified as nonconforming and withheld from production channels. The Seller shall initiate and maintain records for each such action to clearly reflect the condition of the supplies and the action taken to correct the condition. Records shall also reflect the disposition action taken, signatures of authorizing personnel, and evidence of compliance with the disposition.
3. Records of nonconformance related costs, i.e., scrap, rework, repair, use as is, and manufacturing hours for the reported period, shall be maintained and utilized by Seller and MDC to track trends and set goals for cost reduction. Upon notification by MDC of unsatisfactory trends/progress in nonconformance cost and/or incident reduction, Seller shall respond with explanation/proposed corrective action. Failure by Seller to satisfactorily respond will result in MDC seeking consideration for acceptance of nonconforming material.
4. Nothing herein or in other parts of the contract shall be construed as granting the Seller the authority to make repairs, or accept without repair any nonconformance condition which adversely affects fit, form, function, safety, weight, maintainability or appearance (where a factor), of products to be applied to the contract. Within twenty-four (24) hours of determination of such nonconformances, Seller must provide written notice to MDC using MDC Form MD-1898, Request for Deviation/Waiver, to seek concession from the customer (MDC) for use-as-is and repair dispositions.
5. Any nonconformance with any of the Seller's own detailed design, manufacturing, or process requirements not included in or affecting specifications or drawings forming a part of the contract, and not constituting a breach of warranty by the Seller, may be handled by the Seller's normal practices.
6. Each action may be reviewed by the MDC representative. MDC reserves the right to disapprove the Seller's disposition of nonconforming supplies and to require subsequent corrective action at any time.
7. When Government source inspection is required by the contract, the Seller shall coordinate the extent of participation with the cognizant Government agency.

NOTE: SELLER'S REQUEST FOR MATERIAL REVIEW AUTHORITY - Sellers desiring material review authority must submit a formal written request to the MDC Purchasing Representative. Sellers material review board will not function as such until written authorization has been received from the MDC Purchasing Representative. The report period set forth in paragraph 3 above is monthly and a copy of the report shall be forwarded by Seller to MDC upon request.

**6060** ITEMS NOT SUBJECT TO QUALITY ASSURANCE

MDC Quality Assurance has reviewed this PO/Contract and determined that the items on this PO/Contract do not require additional Quality Assurance Clauses.

**6070** SELLERS COMPLIANCE TO ISO 9001

Seller shall have a quality program that complies with International Standards Organization ISO 9001 - "Model for Quality Assurance in Design/Development, Production, Installation, and Servicing."

At MDC's request, the Seller shall provide for MDC's review of the quality program manual, including a matrix, that traces the provisions of ISO 9001 to the supplier's documented procedures.

At MDC's request, the Seller is subject to periodic audit/assessment of their quality program to ensure compliance to ISO 9001 requirements. At MDC's discretion, registered ISO 9001 suppliers may not be subjected to audit/assessment by MDC if they have provided a copy of their ISO 9001 registration certificate issued by an approved ISO 9000 registrar to MDC.

If MDC accepts Seller's ISO 9001 registration and in the event the Seller changes registrars, loses registration status, or are put on notice of losing registration status, the Seller shall notify the MDC procuring component(s) within three (3) days of receiving such notice from their registrar.

**6071**

#### SELLERS COMPLIANCE TO ISO 9002

Seller shall have a quality program that complies with International Standards Organization ISO 9002 - "Model for Quality Assurance in Production, Installation, and Servicing."

At MDC's request, the Seller shall provide for MDC's review of the quality program manual, including a matrix, that traces the provisions of ISO 9002 to the supplier's documented procedures.

At MDC's request, the Seller is subject to periodic audit/assessment of their quality program to ensure compliance to ISO 9002 requirements. At MDC's discretion, registered ISO 9002 suppliers may not be subjected to audit/assessment by MDC if they have provided a copy of their ISO 9002 registration certificate issued by an approved ISO 9000 registrar to MDC.

If MDC accepts Seller's ISO 9002 registration and in the event the Seller changes registrars, loses registration status, or are put on notice of losing registration status, the Seller shall notify the MDC procuring component(s) within three (3) days of receiving such notice from their registrar.

**6072**

#### SELLERS COMPLIANCE TO ISO 9003

Seller shall have a quality program that complies with International Standards Organization ISO 9003 "Model for Quality Assurance in Final Inspection and Test."

At MDC's request, the Seller shall provide for MDC's review of the quality program manual, including a matrix, that traces the provisions of ISO 9003 to the supplier's documented procedures.

At MDC's request, the Seller is subject to periodic audit/assessment of their quality program to ensure compliance to ISO 9003 requirements. At MDC's discretion, registered ISO 9003 suppliers may not be subjected to audit/assessment by MDC if they have provided a copy of their ISO 9003 registration certificate issued by an approved ISO 9000 registrar to MDC.

If MDC accepts Seller's ISO 9003 registration and in the event the Seller changes registrars, loses registration status, or are put on notice of losing registration status, the Seller shall notify the MDC procuring component(s) within three (3) days of receiving such notice from their registrar.

**6073**

#### SELLERS COMPLIANCE TO ISO 9000-3

Seller shall have a quality program that complies with International Standards Organization document ISO 9001 "Model for Quality Assurance in Design/Development, Production, Installation, and Servicing", as documented in ISO 9000-3, "Quality Assurance Standards - Part 3: Guidelines for the Application of ISO 9001 to the Development, Supply and Maintenance of Software."

At MDC's request, the Seller shall provide for MDC's review of the software quality program manual (may be part of the overall quality manual or exist as a separate document) including a compliance matrix correlating each ISO 9000-3 provision to the supplier's documented procedures.

At MDC's request, the Seller is subject to periodic audit/assessment of their software quality program to ensure compliance to ISO 9000-3 provisions. At MDC's discretion, registered ISO 9001 / 9000-3 Sellers may not require assessment by MDC if they have provided a copy of their registration certificate, issued by an approved ISO 9000 registrar to MDC. In the event the Seller changes registrars, loses or is put on notice of losing registration status, Seller shall notify the MDC procuring component(s) within three (3) days of the change.

**6074**

#### QUALITY SYSTEM TRANSITION (May 2, 2007, Rev)

If Procurement Clause 6003, 6004, 6005, 6006, 6007, 6008, 6070, 6071, 6072 or 6073 is specified in this Purchase Order/Contract, compliance with Seller's present Quality System is acceptable to Buyer provided the Seller agrees to implement the Quality Management System (QMS) specified by Buyer. Seller shall inform the Buyer Purchasing Representative when BQMS is implemented and auditable. Seller acceptance of this Purchase Order/Contract constitutes Seller's agreement to comply with the requirements specified herein and QMS as specified in this Purchase Order/Contract within the time period agreed to between Seller and Buyer.

## STANDARD QUALITY SYSTEM

1. RESERVED

2. RESERVED

3. RESERVED

## 4. QUALITY-SYSTEM REQUIREMENTS

## 4.1 Management Responsibility

## 4.1.1 Quality Policy

The supplier's management with executive responsibility shall define and document its policy for quality, including objectives for quality and its commitment to quality. The quality policy shall be relevant to the supplier's organizational goals and the expectations and needs of its customers. The supplier shall ensure that this policy is understood, implemented, and maintained at all levels of the organization.

## 4.1.2 Organization

## 4.1.2.1 Responsibility and Authority

The responsibility, authority, and the interrelation of personnel who manage, perform, and verify work that is subject to these requirements shall be defined and documented.

## 4.1.2.2 Reserved

## 4.1.2.3 Management Representative

The supplier's management with executive responsibility shall appoint a member of the supplier's own management who, irrespective of other responsibilities, shall have defined authority for:

- a) ensuring that a quality system is established, implemented, and maintained, and
- b) reporting on the performance of the quality system to the supplier's management for review and as a basis for improvement of the quality system.

## 4.1.3 Management Review

The supplier's management with executive responsibility shall review the quality system at defined intervals sufficient to ensure its continuing suitability and effectiveness in satisfying the requirements of the supplier's stated quality policy and objectives (see 4.1.1). Records of such reviews shall be maintained (see 4.16).

## 4.2 QUALITY CONTROL AND CONTRACTUAL COMPLIANCE

- a. The supplier shall establish, document, and maintain a quality system as a means of ensuring that product on completion conforms to specified requirements. The supplier shall prepare a quality manual. The quality manual shall include or make reference to the quality-system procedures and outline the structure of the documentation used in the quality system. NOTE: Guidance on quality manuals is given in ISO 10013.
- b. Seller will provide and maintain a quality control system acceptable to MDC (customer) for the goods and services purchased under this Contract, and Seller shall permit MDC to review procedures, practices, processes and related documents to determine such acceptability. MDC may elect to survey all sellers periodically to ascertain compliance with MDC and U.S. Government requirements which have been made part of this Contract. Seller agrees to provide access to its premises for, and to cooperate with, MDC in the conduct of those surveys.
- c. Unless authorized concession is delegated via Quality Assurance Purchase Order Clause 6050, it shall be Seller's continuing obligation to advise MDC's Purchasing Representative in the event Seller discovers potential or actual nonconformances prior to or during manufacture, and/or subsequent to delivery of product. If authorized concession is not delegated, Seller must provide written notice within twenty-four (24) hours of discovery using Form MD-1898, Request for Deviation/Waiver, to seek concession from MDC (customer) for use-as-is and repair dispositions.
- d. Records of nonconformance related costs, i.e., scrap, rework, repair, use-as-is, repair and manufacturing hours for the reported period, shall be maintained (see paragraph 4.16) and utilized by Seller and MDC to track trends and set goals for cost reduction. Upon notification by MDC of unsatisfactory trends/progress in nonconformance cost and/or incident reduction, Seller shall respond with explanation/proposed corrective action. Failure by Seller to satisfactorily respond will result in MDC seeking consideration for acceptance of nonconforming material.

- e. Foreign procurement of metallic raw materials required to conform to federal, military, or industrial specifications shall be procured per the requirements of those suppliers listed in the Douglas Material Specification (DMS) 2201.

#### 4.3 RESERVED

##### 4.3.1 RESERVED

##### 4.3.2 RESERVED

##### 4.3.3 RESERVED

##### 4.3.4 RESERVED

#### 4.4 RESERVED

#### 4.5 DOCUMENT AND DATA CONTROL

This control shall ensure that:

- a) the pertinent issues of appropriate documents are available at all locations where operations essential to the effective functioning of the quality system are performed;
- b) invalid and/or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use;
- c) any obsolete documents retained for legal and/or knowledge-preservation purposes are suitably identified.

#### 4.6 RESERVED

#### 4.7 CONTROL OF CUSTOMER-SUPPLIED PRODUCT

The supplier shall establish and maintain documented procedures for the control of verification, storage, and maintenance of customer-supplier product provided for incorporation into the finished product or for related activities. Any such product that is lost, damaged, or is otherwise unsuitable for use shall be recorded and reported to the customer (see 4.16) verification by the supplier does not absolve the customer of the responsibility to provide acceptable product.

#### 4.8 PRODUCT IDENTIFICATION AND TRACEABILITY

Where and to the extent that traceability is a specified requirement, the supplier shall establish and maintain documented procedures for unique identification of individual product or batches. This identification shall be recorded (see 4.16).

#### 4.9 APPROVAL OF PROCESSES

If the contract is for MDC designed items, any process listed by DI-4426, Approved Process Sources, which is incorporated herein by reference, shall be performed only by sources qualified by MDC. When it is determined that processes requiring MDC qualification are to be performed within the Seller's facility, the Seller shall request MDC qualification of the processes unless Seller is currently listed as an approved source for processes involved on the "MDC Approved Process Sources" list. When such processes are to be performed by a source outside the Seller's own facility, first consideration should be given to sources already qualified by MDC. The names of MDC qualified sources may be obtained from the MDC Purchasing Representative. If an MDC qualified source is not available, the Seller shall request to qualify a Seller chosen source.

#### 4.10 INSPECTION, ACCEPTANCE AND REJECTION

- a. Seller will provide and maintain an inspection system acceptable to MDC (customer) covering goods and services under this contract and will tender only goods that have been inspected and found to conform to this contract's requirements. Seller will keep records evidencing inspections and their result, and will make these records available to MDC and the Government during contract performance and for three years after final payment.
- b. All goods (which term throughout this Contract includes, without limitation, processes, technical information, computer software, raw materials, components, intermediate assemblies, end products and, where applicable, services to be performed hereunder) may be subject to inspection and test at all times and places, including the period of manufacture, by MDC, and the Government.
- c. Seller shall provide all reasonable facilities for the safety and convenience of inspectors at no additional cost to MDC. Seller shall furnish to inspectors all information and data as may be reasonably required to perform their inspection. All goods to be delivered hereunder may be subject to final inspection, test and acceptance by MDC at destination, notwithstanding any payment or inspection at source. MDC shall accept or give notice of

rejection of goods delivered hereunder within a reasonable time after receipt of such goods. Acceptance by MDC shall not waive any rights that MDC might otherwise have at law or by express reservation in this Contract with respect to any nonconformity. Conditions arising under this contract may require MDC participation in quality assurance activity related to this contract at Seller's procurement sources. All such MDC activity shall be coordinated through Seller's quality organization and shall require the same assistance as provided at Seller's facility.

- d. Inspection and acceptance of any goods by MDC shall not be deemed to alter or affect the obligations of Seller or the rights of MDC under the Warranties herein as may be provided by law.
- e. Records shall identify the inspection authority responsible for the release of conforming product (see 4.16).

#### 4.11 CONTROL OF INSPECTION, MEASURING, AND TEST EQUIPMENT

##### 4.11.1 General

The supplier shall establish and maintain documented procedures to control, calibrate, and maintain inspection, measuring, and test equipment (including test software) used by the supplier to demonstrate the conformance of product to the specified requirements. Where the availability of technical data pertaining to the measurement equipment is a specified requirement, such data shall be made available, when required by the customer or customer's representative, for verification that the measuring equipment is functionally adequate.

##### 4.11.2 Control Procedure

The supplier shall:

- a) determine the measurements to be made and the accuracy required, and select the appropriate inspection, measuring, and test equipment that is capable of the necessary accuracy and precision;
- b) identify all inspection, measuring, and test equipment that can affect product quality, and calibrate and adjust them at prescribed intervals, or prior to use, against certified equipment having a known valid relationship to internationally recognized standards.
- c) Maintain calibration records for inspection, measuring, and test equipment (see 4.16).

NOTE: The metrological confirmation system for measuring equipment given in ISO 10012 may be used for guidance.

#### 4.12 INSPECTION AND TEST STATUS

The inspection and test status of product shall be identified by suitable means, which indicate the conformance or nonconformance of product with regard to inspection and tests performed. The identification of inspection and test status shall be maintained to ensure that only product that has passed the required inspection and test (or released under an authorized concession [see 4.13]) is dispatched.

#### 4.13 CONTROL OF NONCONFORMING PRODUCT

The supplier shall establish and maintain control of product that does not conform to specified requirements to ensure that unintended use or delivery is avoided. Control shall provide for identification, documentation, evaluation, segregation (when practical), disposition of nonconforming product, and for notification to the functions concerned.

The description of repairs, and of any nonconformity that has been accepted under authorized concession (see paragraph 4.2.c), shall be recorded to denote the actual condition (see paragraph 4.16).

Repaired and/or reworked product shall be reinspected in accordance with documented procedures.

#### 4.14 CORRECTIVE ACTION

The supplier shall:

- a) investigate nonconformities that have been identified from the analysis of inspection and test reports and customer complaints of product;
- b) determine and implement appropriate corrective action on the nonconformities;
- c) ensure that relevant information on the actions taken is submitted for management review (see 4.1.3).

#### 4.15 HANDLING, STORAGE, PACKAGING, PRESERVATION AND DELIVERY

##### 4.15.1 General

The supplier shall establish and maintain documented procedures for handling, storage, packaging, preservation, and delivery of completed product.

#### 4.15.2 Handling

The supplier shall provide methods of handling product that prevent damage or deterioration.

#### 4.15.3 Storage

The supplier shall use designated storage areas or stock rooms to prevent damage or deterioration of product, pending delivery. Appropriate methods for authorizing receipt to and dispatch from such areas shall be stipulated.

In order to detect deterioration, the condition of product in stock shall be assessed at appropriate intervals.

#### 4.15.4 Packaging

The supplier shall control packing, packaging, and marking processes (including materials used) to the extent necessary to ensure conformance to specified requirements.

#### 4.15.5 Preservation

The supplier shall apply appropriate methods for preservation and segregation of product when the product is under the supplier's control.

#### 4.15.6 Delivery

The supplier shall arrange for the protection of the quality of product. Where contractually specified, this protection shall be extended to include delivery to destination.

### 4.16 CONTROL OF QUALITY RECORDS

The supplier shall establish and maintain control of appropriate quality records to demonstrate conformance of the finished product to specified requirements and the effective operation of the quality system.

Quality records shall be legible and identifiable to the product involved. Quality records that substantiate conformance to the finished product with the specified requirements and the effective operation of the quality system shall be retained for an agreed period and made available on request.

NOTE: Records may be in the form of any type of media, such as hard copy or electronic media.

### 4.17 INTERNAL QUALITY AUDITS

The supplier shall carry out internal quality audits to determine the effectiveness of the quality system.

The results of the audits shall be recorded (see 4.16) and brought to the attention of the personnel having responsibility in the area audited. The management personnel responsible for the area shall take timely corrective action on deficiencies found during the audit.

### 4.18 RESERVED

### 4.19 RESERVED

### 4.20 STATISTICAL TECHNIQUES

The supplier shall:

Identify the need for statistical techniques required for the acceptability of product characteristics.

### 4.21 INTERFACE KEY CHARACTERISTICS IDENTIFICATION AND CONTROL

Clause 6750 will be imposed on this purchase order when interface key characteristics identification and control is applicable.

#### DEFINITION: Interface Key Characteristic (IKC)

Those features of a part, assembly or operational system where variation significantly affects fit, form orientation, location with assembly tools and mating parts, and performance of mechanical/electrical subsystems in functional checkout testing. Three sources of IKCs are the interfaces between part and next higher assembly, part and tool or part and test equipment.

## 1.0 PURPOSE

To establish minimum requirements for Seller's Software Quality Assurance Program.

## 2.0 REQUIREMENTS

### 2.1 General

2.1.1 A Software Quality Program Plan (SQPP), implementing the Software Quality Assurance Program, shall be prepared, maintained, and followed by the Seller. The Seller's Software Quality Program Plan shall address, as a minimum, the items contained in the Data Item Description (DID) identified in the contract. The SQPP shall also address the following paragraphs.

2.1.2 The SQPP shall include provisions for revision as necessary. The SQPP, and revisions, shall be subject to approval by Buyer. The Seller's Software Quality Program Plan, and additions or changes thereto, shall be submitted to Buyer a minimum of thirty (30) calendar days, or as otherwise requested by Buyer, prior to the intended or required use of the SQPP by the Seller and is subject to written disapproval by Buyer. If the Seller has not been notified of disapproval by Buyer within twenty (20) days after receipt at Buyer, the SQPP may be implemented subject to change.

2.1.3 The SQPP shall include (1) deliverable software and (2) non-deliverable software that is used as a media-of inspection" or for qualification. The SQPP shall reference or document the Seller's procedures that support the Software Quality Assurance Program and these procedures shall become part of the QPP.

2.1.4 The SQPP shall indicate compliance with the software quality assurance requirements identified in the contract.

### 2.2 Organization

Organizational disciplines responsible for each of the various software quality elements shall be documented. The personnel performing software quality functions shall have sufficient authority, responsibility and freedom of action to evaluate software development and production and be able to initiate and/or recommend changes.

### 2.3 Tools, Techniques, and Methodologies

Tools, techniques and methodologies to be employed in the performance of the work shall be identified. The Plan shall state how quality assurance objectives will be supported.

### 2.4 Testing

2.4.1 Testing measures shall include, but not be limited to:

- a. Review of test requirements and criteria for adequacy, feasibility and satisfaction of requirements (ensure that test media/documentation is maintained to allow test repeatability);
- b. Review of test plans and procedures for compliance with standards and contract requirements;
- c. Identification and acceptability of support software and computer hardware used to develop and/or support test of software to be delivered to Buyer;
- d. Review and certification of the accuracy of test observations and results achieved.

2.4.2 The SQPP shall specify that all formal software testing and validation required by the PO/Subcontract must be verified/witnessed by an Buyer's Software Quality Representative. Buyer's Software Quality Assurance shall be notified at least forty-eight (48) hours in advance of date tests are to be performed so that necessary arrangements can be made.

### 2.5 Storage, Handling, Packaging, Packing and Shipping

Procedures for ensuring adequate protection of contractually required computer software through delivery to Buyer shall be included or referenced in the SQPP. The procedures shall have provisions to ensure that shipments meet requirements for marking and packaging and for the presence of correctly completed packing sheets. Packaging and shipping procedures shall consider the protection of software due to factors such as physical damage, contamination, moisture, and external magnetic influences.

### 2.6 Software Certificate of Conformance

The SQPP shall specify that Form DAC 2-1040, Supplier Software Certificate of Conformance, or Seller equivalent, shall, unless specifically excluded, be provided with each software media transmittal and shall certify source data, media, test, and equipment configuration that resulted in the end item product and shall list open item status.

#### 2.7 Records

The SQPP shall specify that the Seller shall prepare and maintain records of software quality program activities required by the contract. The Plan shall provide that records shall be maintained on file and available for Buyer review for ten (10) years after final payment under the contract. At any time during the retention period, at Buyer's request, Seller will deliver said records, or any part thereof, to Buyer at no additional cost to Buyer and, as a minimum include:

- a. Evidence of testing, test verification and acceptance.
- b. Software problems observed and corrective actions.

#### 2.8 Reusable or Commercial Software

When reusable or commercial software is a deliverable product, the SQPP shall include or reference the following:

- a. Software "rights" data shall be clearly identified in the SQPP or referenced to Engineering data.
- b. Software testing plans shall be clearly identified in the SQPP or referenced to Engineering data.
- c. Specific written Government concurrence is obtained through Buyer that reusable or commercial software procurement is authorized.

#### 2.9 Buyer/Government Audit Rights

The SQPP shall acknowledge that Buyer/Government reserves the right to audit or monitor Seller's compliance at any time during the life of the contract. Buyer/Government may elect to test software product at any stage and any place, including the facilities of any subtier suppliers. Such inspections shall be requested through, and performed with, the Seller. Buyer/Government review shall not constitute acceptance, nor shall it in any way replace evaluation by the Seller or otherwise relieve the Seller of his responsibility to furnish acceptable software and associated documentation.

#### 2.10 Independent Verification and Validation

Seller support of Independent Verification & Validation (IV & V), when required, shall be documented in the SQPP.

#### 2.11 Software Development Files

The SQPP shall provide for evaluation of Software Development Files (SDFs).

#### 2.12 Disaster Controls for Software

The SQPP shall provide or reference provisions made to ensure that software will be retained in the event of a disaster.

#### 2.13 Review of Deliverable Documentation

The SQPP shall provide for review of deliverable documentation. Documentation standards and programming conventions and practices to be used for all software shall be referenced or documented in the SQPP. The SQPP shall referenced or document the procedures to be applied to assure compliance with standards, practices, and conventions and delivery of correct documentation and change information to Buyer. In addition, the SQPP shall provide for the independent review of documentation and for designation of the Seller's approval authority for software documentation standards and for the software quality plan.

#### 2.14 Software Quality Evaluations

The SQPP shall identify reviews and audits to be performed by the supplier to evaluate software development processes and products as identified in the Software Development Plan.

#### 2.15 Schedule

The SQPP shall include a schedule of all reviews and audits to be performed.

#### 2.16 Problem Reporting and Corrective Action

Procedures to assure the prompt detection, reporting and correction of deficiencies shall be included or referenced in the SQPP. As a minimum, this shall include:

- a. Problem report forms for reporting, tracking, analyzing, and closing software problems;
- b. Trend analysis to determine cause of software problems;
- c. Review of corrective action for effectiveness; and
- d. Providing Buyer visibility of the software problems and the effectiveness of the corrective actions taken.

#### 2.17 Library Controls

2.17.1 Procedures and controls to ensure the integrity of computer programs and provide traceability for configurations submitted for control shall be included or referenced in the SQPP. The Seller shall prevent unauthorized changes to the source or object programs, shall assure that approved changes are correctly integrated and that software submitted for test or delivery is the correct version.

2.17.2 Master copies of computer program source and object code shall be retained on magnetic tapes or disks, and shall be clearly and completely identified.

2.17.3 Status accounting of computer program versions shall be maintained current.

#### 2.18 Configuration Management

Quality assurance measures to be applied to software configuration management shall be specified in the SQPP. These measures shall be concerned with the adequacy of:

- a. Identification of software (baseline, revisions and versions);
- b. Security and accessing of controlled software; and
- c. Configuration status accounting.

#### 2.19 Subtier Supplier Control

The Seller shall impose requirements comparable to those contained in this document on subtier suppliers and shall assume responsibility for the quality of all procured software unless otherwise directed by Buyer. The Seller shall assure Buyer's right of entry into the subtier supplier's facilities.

**6082**

### BUYER REQUIREMENTS FOR SUPPLIER SOFTWARE BLOCK UPGRADE (Nov 2, 2001, Rev)

#### 1.0 Quality System

The Seller shall maintain a basic software quality system using MIL-STD-498, Software Development & Documentation, and the guidance of RTCA/DO-178B, Software Considerations in Airborne Systems and Equipment Certification, with particular emphasis on technical requirements, engineering deliverables, technical status tracking, design reviews and general verification of requirements. ANSI/ASQC Q9001-1994, American National Standard, Quality System - Model for Quality Assurance in Design, Development, Production, Installation shall be used as guidelines. ANSI/ASQC Q9001-1994 certification is not required.

Software upgrade investigations, software modifications, and the development of software and documentation shall adhere to these standards. Existing documentation will be revised so as not to increase the contract by changing to new documents standards. Management indicators will be supplied as part of new contracts.

The Seller shall document the software quality assurance program in a Software Quality Program Plan (SQPP) in accordance with the Seller Data Requirements List (SDRL), and Clause 6081, if included in this contract, Software Quality Program Plan Requirements.

#### 2.0 Documentation

Every requirement, including changes, must be traceable from the Purchase Order – Statement of Work and other applicable procurement documentation to the design, testing, and other documents as required The Boeing Company and its Customers, to show requirements completion. Changes/additions to requirements shall be identified with change bars or highlighted, when incorporated into documents.

Software requirements and design documents, test plans/procedures/results and Software Version Description (SVD) documents shall be produced in accordance with the SDRL and in compliance with MIL-STD-498, Data Item Description (DID), format. Existing documentation will be revised so as not to increase the contract price by changing

to MIL-STD 498.

### 3.0 Metrics

Software metrics used are contained in MIL-STD-498 management indicators and as requested by the customer. These metrics will be sent to SQA-Long Beach, C17 Program, once a month and reviewed at joint technical reviews or meetings as required and during SQA evaluations. The following metrics are defined and based on MIL-STD-498.

#### 3.1 Requirements Volatility

Software requirements volatility: identify the total number of requirements, number of requirements changes and total number of changes per Computer Software Configuration Item (CSCI) for each phase. Seller SQA will monitor and status changes to SQA-Long Beach, C-17 Program, monthly and at major milestones.

#### 3.2 Software Size

Software size: track the planned and actual number of units coded, estimated and actual total Source Lines of Code (SLOC) for each CSCI. Include the amount of code that is estimated for reuse and actual amount of code reused. Estimate the percentage of code to be changed overall on upgrades at project start. Provide estimated software lines of code to be changed at design review, at Test Readiness Review (TRR) and PQT/FQT and report at TRR.

#### 3.3 Spare Memory

Track the available spare memory before project start and throughout the period of performance. Report the status of spare memory at each major milestone as required or as Test Plans require.

#### 3.4 Milestone Performance

A schedule identifying top level milestones with planned and actual tasks shall be identified on the schedule. Software builds shall be identified on the schedule. The schedule shall be maintained to reflect project milestones and SQA tasks planned, including actual completion dates. The schedule must be developed in MS-Project or a compatible package (file is to be readable by MS-Project), and delivered bi-weekly on Personal Computer compatible media.

Status software progress by units planned and actual number of software units designed, units implemented, units tested, and integrated for each phase in monthly report during project development.

An analysis of project technical and schedule risk factors, cost concerns, and labor hours shall be provided at project start, updated at milestones, and updated as a part of schedule recovery plans. Recommended recovery plans for schedules and risks shall be provided as part of monthly status report. As recovery plans are implemented the status of each shall be reported until schedules are recovered and completed.

#### 3.5 Problem/Change Report Status

Track the total number of problems identified, the number of closed problems, and the number of open problems throughout the development effort (by phase and as found in review meetings such as PDL, Code, Design). A description and the complexity level for each problem shall be identified based on action taken. Provide this information bi-weekly, sorted by the age of problem, the priority of problem, and the risk to project.

The status of problems/changes shall be provided on number of open items in current period, by age and priority, with number closed, and total number overall included with schedule.

#### 3.6 Build Release Content

Build release content: track the planned and actual number of units released in each build. Also provide an estimate of the number of builds planned at the start of coding and the number of builds completed in the monthly status report.

Evidence of successful dry runs and the number of defects identified during testing shall be provided two weeks before the TRR (or equivalent TIM) is conducted, to ensure readiness for Qualification testing, to SQA-Long Beach, C-17 Program.

#### 3.7 Software Staffing

Planned and actual personnel staffing levels mapped to the project schedule shall be delivered monthly with labor hours per task.

#### 3.8 Training

The level of training required for each person shall be provided for each task at the beginning of project.

#### 4.0 Project Oversight

Technical Interchange Meetings (TIMs), project reviews and other progress meetings shall be fully coordinated, in advance, with SQA-Long Beach, C17 Program SQA. Notice of progress meetings shall be provided to enable SQA-Long Beach, C17-Program, SQA attendance. Project reviews, TIM and other progress meetings shall be identified on the schedule. The metrics specified in 3.0 shall be reviewed during each review/status meeting. At the beginning of each review the Seller Contractor SQA shall present the status of each open action item/issue. Prior to each review/status meeting the disposition and status of each open item/issue shall be coordinated with SQA- Long Beach, C17 Program SQA. Seller Contractor SQA shall obtain C17 SQA-Long Beach, C-17 Program approval of the SQA presentation package before each review.

6083

#### SOFTWARE QUALITY PROGRAM PLAN REQUIREMENTS FOR B-1B PROGRAM SUPPLIERS

1.0 PURPOSE. To establish requirements for Seller's Software Quality Assurance Program in accordance with Boeings Quality Management System (BQMS) requirements for suppliers.

#### 2.0 REQUIREMENTS.

##### 2.1 General.

2.1.1 A Software Quality Program Plan (SQPP), implementing the Software Quality Assurance Program, shall be prepared, maintained, and followed by the Seller. The Seller's Software Quality Program Plan shall address, as a minimum, the items contained in the Data Item Description (DID) identified in the contract. The SQPP shall also address the following paragraphs.

2.1.2 The SQPP and revisions shall be subject to approval by the buyers Software Quality Engineering (SQE) Organization. The Seller's Software Quality Program Plan, and additions or changes thereto, shall be submitted to Buyer a minimum of thirty (30) calendar days, or as otherwise requested by Buyer, prior to the intended or required use of the SQPP by the Seller and is subject to written disapproval by Buyer. If the Seller has not been notified of disapproval by Buyer within twenty (20) days after receipt at Buyer, the SQPP may be implemented subject to change.

2.1.3 The SQPP shall address (1) deliverable software and (2) non-deliverable software that is used as a "media-of inspection" or for qualification. of the deliverable software. The SQPP shall contain or reference Seller's procedures, processes, and products that support the Software Quality Assurance Program and these procedures shall become part of the SQPP.

2.1.4 The SQPP shall indicate compliance with the software quality assurance requirements identified in the contract.

##### 2.2 Organization.

Responsibilities for the activities of the software quality program will be assigned. The personnel responsible for ensuring compliance with the software quality program requirements shall have the resources, responsibility, authority, and organizational freedom to permit objective evaluations and to initiate and verify corrective action.

##### 2.3 Tools, Techniques, and Methodologies.

Tools, techniques, and methodologies to be employed in the performance of the work shall be identified. The Plan shall state how quality assurance objectives will be supported.

##### 2.4 Testing.

2.4.1 Testing measures shall include, but not be limited to:

- a. Review of test requirements and criteria for adequacy, feasibility and satisfaction of requirements (ensure that test media/documentation is maintained to allow test repeatability);
- b. Review of test plans and procedures for compliance with standards and contract requirements;
- c. Identification and acceptability of support software and computer hardware used to develop and/or support test of software to be delivered to Buyer; and
- d. Review and certification of the accuracy of test observations and results achieved.

2.4.2 The SQPP shall specify that all formal software testing and validation required by the PO/Subcontract may be verified/witnessed by Buyer's Software Quality Representative. Buyer's Software Quality Assurance shall be notified at least forty-eight (48) hours in advance of date tests are to be performed so that necessary arrangements can be made.

#### 2.5 Storage, Handling, Packaging, Packing and Shipping.

Procedures for ensuring adequate protection of contractually required computer software through delivery to Buyer shall be included or referenced in the SQPP. The procedures shall have provisions to ensure that shipments meet requirements for marking and packaging and for the presence of correctly completed packing sheets. Packaging and shipping procedures shall provide for the protection of software due to factors such as physical damage, contamination, moisture, and external magnetic influences.

#### 2.6 Software Certificate of Conformance.

The SQPP shall define the process which provides objective evidence that the product satisfies its specified requirements.

#### 2.7 Records.

The SQPP shall specify that the Seller shall prepare and maintain records of software quality program activities required by the contract. The Plan shall provide that records shall be maintained on file and available for Buyer review for ten (10) years after final payment under the contract. At any time during the retention period, at Buyer's request, Seller shall deliver said records, or any part thereof, to Buyer at no additional cost to Buyer and, as a minimum include:

- a. Evidence of testing, test verification and acceptance; and
- b. Software problems observed and corrective actions.

#### 2.8 Reusable or Commercial Software.

When reusable or commercial software is a deliverable product, the SQPP shall include or reference the following:

- a. Software "rights" data shall be clearly identified in the SQPP;
- b. Software testing plans shall be clearly identified in the SQPP, in the absence of a separate buyers approved Software Test Plan; and
- c. Specific written Government concurrence is obtained through Buyer that procurement and use of reusable or commercial software is authorized.

#### 2.9 Buyer/Government Audit Rights.

The SQPP shall acknowledge that Buyer/Government reserves the right to audit or monitor Seller's compliance at any time during the life of the contract. Buyer/Government may elect to test software product at any stage and any location, including the facilities of any sub tier suppliers. Such inspections shall be requested through, and performed with, the Seller. Buyer/Government review shall not constitute acceptance, nor shall it in any way replace evaluation by the Seller or otherwise relieve the Seller of his responsibility to furnish acceptable software and associated documentation.

#### 2.10 Independent Verification and Validation.

Seller support of Independent Verification & Validation (IV & V), when required, shall be documented in the SDP.

#### 2.11 Software Development Files.

The SQPP shall provide for evaluation of Software Development Files (SDFs).

#### 2.12 Disaster Controls for Software.

The SQPP shall provide or reference provisions made to ensure that software will survive in the event of a disaster.

#### 2.13 Review of Deliverable Documentation.

The SQPP shall provide for review of deliverable documentation. Documentation standards and programming conventions and practices to be used for all software shall be referenced or documented in the SQPP. The SQPP shall referenced or document the procedures to be applied to assure compliance with standards, practices, and conventions and delivery of correct documentation and change information to Buyer. In addition, the SQPP shall provide for the independent review of documentation and for designation of the Seller's approval authority for software documentation standards and the SQPP.

#### 2.14 Software Quality Evaluations.

The SQPP shall identify reviews and audits to be performed by the supplier to evaluate software development

processes and products as identified in the Software Development Plan.

#### 2.15 Schedule.

The SQPP shall include a schedule of all reviews and audits to be performed.

#### 2.16 Problem Reporting and Corrective Action.

Procedures to assure the prompt detection, reporting, and correction of deficiencies shall be included or referenced in the SQPP. As a minimum, this shall include:

- a. Problem report forms for reporting, tracking, analyzing, and closing software problems;
- b. Trend analysis to determine cause of software problems;
- c. Review of corrective action for effectiveness; and
- d. Providing Buyer visibility of the software problems and the effectiveness of the corrective actions taken.

#### 2.17 Library Controls.

2.17.1 Procedures and controls to ensure the integrity of computer programs and provide traceability for configurations submitted for control shall be included or referenced in the SQPP. The Seller shall prevent unauthorized changes to the source or object programs, shall assure that approved changes are correctly integrated and that software submitted for test or delivery is the correct version.

2.17.2 Master copies of computer program source and object code shall be retained on magnetic tapes, floppy disks or CD's, and shall be clearly and completely identified.

2.17.3 Status accounting of computer program versions shall be maintained current.

#### 2.18 Configuration Management.

Quality assurance measures to be applied to software configuration management shall be specified in the SQPP. These measures shall be concerned with the adequacy of:

- a. Identification of software (baseline, and versions);
- b. Security and accessing of controlled software; and
- c. Configuration status accounting.

#### 2.19 Sub-tier Supplier Control.

The Seller shall impose requirements comparable to those contained in this document on sub-tier suppliers and shall assume responsibility for the quality of all procured software unless otherwise directed by Buyer. The Seller shall assure Buyer's right of entry into the sub-tier supplier's facilities.

**61XX**

### **SPECIFICATIONS/MILITARY REQUIREMENTS**

**6120**

#### **QUALITY REQUIREMENTS - BREATHING OXYGEN (MIL-0-27210)**

Seller shall comply with the requirements of MIL-0-27210 and the following:

1. Manufacturers of aviator's breathing oxygen shall furnish MDC a certificate of conformance to MIL-STD-1551 with each shipment:
2. Sellers of aviator's breathing oxygen in cylinders shall furnish MDC with each shipment:
  - a. A copy of bulk Seller's certificate of conformance to MIL-STD-1551 (to assure Air Force-approved oxygen); and
  - b. Seller's own certificate of conformance to MIL-0-27210 (to assure cleanliness of transfer, storage, conversion, and regulating equipment).
3. If hydrostatic testing is required, the Seller shall comply with the applicable requirements of the Code of Federal Regulations, 49 CFR 171-190, Hazardous Materials Regulations of the Department of Transportation;

4. Copies of test certificates and periodic test results shall be maintained on file at Seller's facility for a minimum of two years.

**6140** SELLER'S COMPLIANCE WITH MIL-STD-410

Seller shall have a certification system that assures compliance with MIL-STD-410, "Nondestructive Testing Personnel Qualification and Certification (Eddy Current, Liquid Penetrant, Magnetic Particle, Radiographic and Ultrasonic)." Any deviation or waiver to this requirement must be approved by the MDC Purchasing Representative and MDC Quality Assurance prior to start of any production materials.

**62XX** INSPECTION

**6201** GOVERNMENT SOURCE INSPECTION (25 Jan 2008 Rev)

Government inspection is required prior to shipment from your plant. On receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant, or, if none, to the nearest Army, Navy, Air Force, or Defense Supply Agency Inspection Office, so that appropriate planning for Government inspection can be accomplished. In the event the representative or office cannot be located, our Purchasing Representative should be notified immediately.

Evidence of this Government inspection must be indicated on the shipper or packing sheet for each shipment.

GSI is not required for work performed by Government personnel at Air Logistics Centers

**6202** GOVERNMENT AGENCY NOTIFICATION - SOFTWARE

Government inspection is required for software on this Contract.

On receipt of this order, promptly furnish a copy to the Government Representative who normally services your plant, or, if none, to the nearest Army, Navy, Air Force, or Defense Supply Agency Inspection Office, so that appropriate planning for Government inspection can be accomplished. In the event the representative or office cannot be located, our Purchasing Representative should be notified immediately.

Evidence of this Government inspection must be indicated on the shipper or packing sheet for each shipment.

**6203** GOVERNMENT MANAGEMENT RISK FUNDING

This government management risk order may be subject to additional QA requirements upon approval of Government contract funding.

**6204** DISCRETIONARY GOVERNMENT SURVEILLANCE (DGS)

During performance of this contract, Seller and Seller's Subcontractor's quality and manufacturing processes are subject to review, verification, and analysis by authorized Government Quality Representatives.

Government inspection or release of goods or services prior to shipment is not required unless Seller is otherwise notified.

Seller shall provide a copy of this contract upon receipt to the Government Quality Representative who services Seller's facility.

In the event the Government Quality Representative or DCMA office cannot be located, Seller shall immediately notify Buyer's Authorized Procurement Representative.

**6211** MDC QUALITY ASSURANCE AT SUPPLIER

MDC source inspection is required at Seller's facility.

Items on this PO/Contract may be subject to MDC inspection prior to assembly and throughout all assembly, processing and testing operations. MDC may impose in-process inspection when engineering requirements such as dimensions, material type, functionality, performance or key characteristics cannot be adequately determined at end

item inspection.

If in-process inspection is required, the MDC Quality Assurance Representative will determine the need for, coordinate with Seller, and impose mandatory inspection points. Seller shall document MDC inspection points on Seller's fabrication planning document (i.e., shop traveler).

Seller shall notify MDC Source Inspection at least forty-eight (48) hours prior to proceeding with product processing or manufacturing in conjunction with this purchase.

Seller shall notify MDC Source Inspection at least forty-eight (48) hours prior to reaching an inprocess inspection point, if any, or an end item inspection.

Evidence of MDC end item inspection must be indicated on the packing sheet, and any MDC supplied documentation accompanying each shipment.

If Supplier has been granted Supplier Inspection Delegation (SID) status, Supplier will refer to Clause 6243 in lieu of 6211

If Supplier has been granted SID status, Supplier notification of MDC Source Inspection is not required for inspection/acceptance of material, and Supplier stamp may be used as evidence of product acceptance in lieu of MDC Quality Assurance Representative stamp, unless notified otherwise by MDC.

Clause 6243 text can be found below.

**6230** MDC WITNESSING OF FORMAL SOFTWARE TESTING AT SELLER'S FACILITY  
(13 Dec 2002, REV)

All formal software testing and validation required by PO/Contract must be verified/witnessed by an MDC Quality Representative. Notify MDC Software Quality Assurance at least fortyeight (48) hours in advance of date tests are to be performed so that necessary arrangements can be made.

**6231** MDC WITNESSING OF FASTENER FATIGUE TESTING AT SELLER'S FACILITY

Seller's material acceptance testing must be witnessed by an MDC Quality Assurance Representative. Notify MDC Quality Assurance Representative at least forty-eight (48) hours in advance of date tests are to be performed so that necessary arrangements can be made. Evidence of MDC's witnessing shall appear on Seller's acceptance test reports.

**6232** MDC WITNESSING OF FUNCTIONAL ACCEPTANCE TESTING AT SELLER'S FACILITY

Seller's functional acceptance testing must be verified/witnessed by an MDC Quality Assurance Representative. Notify MDC Source Inspection at least forty-eight (48) hours in advance of the date tests are to be performed so that necessary arrangements can be made.

**6241** REQUIREMENT FOR 100% INSPECTION BY SELLER

Seller shall perform 100% inspection of all items on this PO/Contract to ensure conformance to drawing and specification requirements. Evidence of such inspection must be on Seller shall perform 100% inspection of all items on this PO/Contract to ensure conformance to drawing and specification requirements. Evidence of such inspection must be on file and available for review by MDC.

**6242** RADIOGRAPHIC INSPECTION BY SELLER

Radiographic inspection (X-ray) of unit(s) procured on this PO/Contract is required in accordance with the instructions on the X-ray inspection procedure furnished with this PO/Contract. Completed X-ray film(s), identified to item(s) ordered herewith, shall accompany shipment to MDC.

**6243** SUPPLIER INSPECTION DELEGATION (SID) PROGRAM

This quality clause signifies Seller is MDC approved for participation in the supplier delegated inspection SID program, and has accepted participation under the program terms, conditions and responsibilities.

Seller is fully responsible for performance of all inspections required to ensure compliance of the deliverable product to all PO/Contract requirements, and is further required to maintain documentation of such performances for the length of time as specified by PO/Contract. Seller shall comply with all quality clause requirements as specified by

PO/Contract. Seller shall provide such documentation, or certified copies thereof, as may be requested/required by MDC or an authorized agent thereof.

Seller shall provide objective evidence of conformance to all specified requirements and completion of all product test/inspections by applying Seller's acceptance stamp to Seller's shipper/packing sheet. This acceptance stamp shall be clearly visible and legible in the center proximity of the Seller's shipper/packing sheet without obscuring pertinent information on the shipper/packing sheet.

Seller shall not utilize the Seller acceptance stamp in the event the Seller disagrees with the "Reason for Rejection" as stated on MDC's Rejection Purchase Order and the Seller determines that no work is to be accomplished. In such an event, Seller must contact MDC's Quality Assurance Representative.

Seller must notify Boeing of any planned facility relocations and for any planned major manufacturing process changes

Seller's participation in the SID program is predicated on an acceptable quality program that provides a quality product. Failure to maintain system requirements and/or provide acceptable quality product will be grounds for MDC to immediately revoke Seller's participation in this program. Such revocation will result in the initiation of additional quality clauses, and may also require the addition of source inspection at Seller's facility at no charge to MDC. This provision is in addition to any rights MDC may have pursuant to other provisions in this PO/Contract.

If Seller SID status has been rescinded or has not been granted, quality clause 6243 shall be invalid, and seller shall contact MDC for source inspection in accordance with quality clause 6211 MDC Quality Assurance at Supplier. MDC Quality Assurance Representative stamp is valid evidence of product acceptance in lieu of Seller stamp, whether or not Seller SID status is active.

NOTE: Valid MDC Source Surveillance verified First Article Inspection Report (FAIR) documented per AS9102, Aerospace First Article Inspection Requirement, (Ref. clause 6261) must be on file at Seller's facility before shipment under the SID program. Gold SID suppliers may be granted FAI delegation, and not require Boeing verification of FAI (Ref clause 6263).

NOTE: SID Seller shall continue to include with each shipment, Acceptance Test Reports (Ref. clause 6320), and D1-4426 Process Certifications (Ref. clause 6301), for parts designated Fracture Critical Category A or B.

**6250**

#### INSPECTION OF PERISHABLE TOOLS

All items must show evidence of inspection for conformity to PO/Contract and specification or drawing requirements. Seller shall furnish certifications and reports of test results when required by specifications or drawing.

**6251**

#### TOOL INSPECTION AND REPORTS BY SELLER

Complete inspection of tools under this PO/Contract must be accomplished by Seller and quantitative inspection results shall be recorded on a report form approved by MDC Tooling Inspection. Copies of inspection report must accompany each shipment to MDC. MDC Tooling Inspection will maintain surveillance of Seller's tool fabrication and inspection to verify inspection points and results of inspection.

**6252**

#### MDC TOOLING INSPECTION AT SELLER'S PLANT

MDC Tooling inspection is required at Seller's facility prior to shipment or use of tooling. Notify MDC Tooling Inspection at least forty-eight (48) hours in advance of time tooling is ready for inspection, so that necessary arrangements can be made.

**6261**

#### MDC SOURCE SURVEILLANCE VALIDATION OF SELLER'S FIRST ARTICLE INSPECTION REPORT (Nov 2, 2001, Rev)

First Article Inspection (FAI) or test shall be performed by Seller at Seller's facility in accordance with SAE AS9102, Aerospace First Article Inspection Requirement. Quantitative results shall be documented on a report form identified as "First Article Inspection Report." Notify MDC Source Inspection at least forty-eight (48) hours in advance to schedule MDC FAI. MDC Source Inspection will verify the conformity of the Seller's FAI, as applicable, and will document results on the applicable form. The MDC FAI Report shall be retained by Seller as evidence of FAI approval.

**6262**

#### SPECIFICATION COMPLIANCE / FIRST ARTICLE INSPECTION REQUIREMENTS FOR END ITEM PROCUREMENT PROGRAM (01 January 2008 Rev)

End-Item Procurement (EIP) is a type of activity unique to die-fabricated parts (i.e., castings, forgings) that allows a supplier to furnish Global Mobility Systems (GMS) with a fully processed casting or forging detail or assembly, ready for aircraft assembly or installation. No further processing is required at GMS, and the part must be an end-item configuration.

Seller shall comply with the requirements of applicable Douglas Material Specifications (DMS) and shall obtain approvals as required from MDC's Materials and Process Engineering (M&PE). Seller shall perform First Article Inspection (FAI) at Seller/subcontractor's facility for all die fabricated, and end item operations, and shall document quantitative results in accordance with SAE AS9102, Aerospace First Article Inspection Requirements. A copy of the FAI Report or equivalent, and a data package consisting of applicable DMS approvals and material certifications shall be forwarded to MDC with the first shipment of parts.

In the event that QA Clause 6211 or 6243 is imposed, Seller FAI and data package submittal is not required to be included with the first shipment of parts.

## **EIP FAI Review**

### **1. Casting Approval:**

- a. Preproduction samples: The supplier is to make two completely processed and finished castings, meeting all dimensional and metallurgical requirements.
- b. Metallurgical approval: Evidence of metallurgical approval by M&PE, Form DAC 25-2440, Boeing Preproduction Casting Qualification Report, and certification of processes by The Boeing Company-approved sources must be submitted by the supplier. (Reference D1-4426, *Approved Process Sources*.)
- c. Dimensional sample: The supplier is to lay out and document quantitative results for one casting of each cavity number and submit the casting with all layout lines to GMS Source Inspection for verification/witnessing. When drawings do not show tooling points, the casting surface used for the start of layout is to be painted in accordance with DMS 1677, *Preproduction Approval of Castings*.
- d. Casting identification is to include the latest change letter affecting the casting.

**Note:** This may not be the latest change letter affecting the drawing.

- e. Class 1A and 1B castings (in accordance with DPS 4.706, *Inspection Requirements for Castings*) are to be procured from the sources listed in Chart 1 of DMS 1677. Class 2A and 2B castings are to be procured from any source that has a current Boeing approval.

### **2. Forging Approval:**

- a. DMS forging technique qualification approval from M&PE (Class 1 forgings only) is to be obtained by the supplier, prior to FAI by GMS Source Inspection.

**Note:** Approval is indicated on Form DAC 25-2378, Boeing Forging Qualification Report.

- b. A forging, representative of the first lot produced, along with the supplier's quantitative inspection results and material specification test data, is to be presented to GMS Source Inspection for verification/witnessing.

**3. Data Requirements for Die-Fabricated Parts:** The supplier is to submit die-fabricated parts and the following documentation to A&T Source Inspection:

- a. Evidence of metallurgical approval/forging technique qualification by M&PE, as applicable;
- b. Dimensional requirements recorded by the supplier on the SAE AS9102 FAI Form 1, Part Number Accountability Article, Form 2, Product Accountability – Raw Material, Special Process, and Form 3, Characteristic Accountability, Verification, and Compatibility Evaluation, or equivalent, showing actual findings versus the drawing requirements.
- c. Quantitative reports for mechanical properties, chemical analysis, heat-treat processes, and Nondestructive Testing (NDT) reports.
- d. A Request for Deviation/Waiver for any nonconformance of the die-fabricated parts.

**4. Data Requirements for Completed Machined Parts:** The supplier is to submit a finished machined part and the following documentation to A&T Source Inspection:

- a. Any applicable DMS documenting approvals for FAI/M&PE acceptance of raw material by A&T;

b. The SAE AS9102 Forms 1, 2, and 3 including all certifications, test reports, processes, and names of responsible agencies;

c. A Request for Deviation/Waiver for any nonconformance of the finished machined part.

**5. Nonconformance of Die-Fabricated and Finished Machine Parts:** The supplier must request a Deviation/Waiver to the drawing by providing written notice within twenty-four (24) hours of discovery using Buyer's Form MD-1898, Request for Deviation/Waiver, and is to obtain formal Engineering and QA approval for the deviation/waiver.

**6263** FIRST ARTICLE AT SELLER FACILITY (Nov 2, 2001, Rev)

Seller shall perform First Article Inspection in accordance with the requirements set forth in SAE AS9102, Aerospace First Article Inspection Requirement. Seller shall forward one (1) copy of First Article Inspection Report (FAIR) to MDC with Seller's shipper in the first shipment of parts. In the event that QA Clause 6211 or 6243 is imposed, Seller FAIR submittal is not required to be shipped with the first shipment of parts.

**6271** INSPECTION OF NONAIRBORNE HARDWARE

All items must show evidence of inspection for conformity to PO/Contract and specification or drawing requirements. Seller shall also furnish report of test results when required by specification or drawing.

**63XX** CERTIFICATIONS/DATA/REPORTS

**6301** SUPPLIER CERTIFICATE OF CONFORMANCE FOR DI-4426 PROCESSES  
10/23/2003 REVISION

Seller shall provide evidence that processes as listed in DI-4426, Approved Process Sources, were performed by MDC approved sources. Such evidence shall be maintained on file by Seller. Included with each shipment to MDC shall be DAC Form 2-455, Supplier Certificate of Conformance, or equivalent certification, indicating as a minimum; the MDC process description and process number, the name and address of the process supplier, the purchase order number and part number.

In the event that QA Clause 6211 or 6243 is imposed, Seller's certification submittal to MDC is not required with the shipment of parts.

NOTE: SID Seller (Ref. Clause 6243) shall continue to include with each shipment, certificates for parts that are designated Fracture Critical Category A or B.

**6302** SURPLUS MATERIAL CERTIFICATION

A. Certification is required indicating that items or components furnished are former surplus property or residual inventory resulting from terminated contracts. Certification shall include a complete description of the items or components, quantity, name of agency from which acquired, and date of acquisition.

B. At the time of Quotation, Suppliers of surplus materials are required to prepare and submit a data package (status/traceable history) which shall be reviewed for approval by Supplier Quality Definition. Upon Purchase Order award, the approved data package shall be made available at the time of MDC Source Inspection and be delivered with the products to the designated MDC location. This documentation shall include, but is not limited to:

1. A statement of the condition of the part(s), in accordance with the following definitions, indicating the status of the part(s) being sold to MDC:

"NEW": A new product, accessory, part, or material in conformity with approved data or conforming to established industry or U.S. specifications. (If the part's status is "new" then certification of such from the manufacturer shall accompany the part.)

"UNUSED": A product, accessory, or material which has been produced by a manufacturer with FAA certification authority to do so or one which has undergone inspection and is certified to conform to type design, and which is being sold by either the original manufacturer or a person other than the original manufacturer. Part or material must be in an unused condition.

"REBUILT": The restoration of a product or accessory, in conformity with approved data, that has been disassembled, and tested to the same tolerances and limits as a new item, using either new or unused parts that conform to new part tolerances and limits.

"OVERHAULED": The restoration of a used part or accessory by inspection and replacement in conformity

with approved data, to renew the operation of life, and which has not been operated or placed in service, except for functional testing.

"INSPECTED": The examination by visual/test procedures of a product or accessory to establish conformity with approved data.

"MODIFIED": The alteration of a product or accessory in conformity with approved data.

"REPAIRED": The restoration of a product or accessory to a serviceable condition in conformity with approved data.

"USED": Any part that has been used in the operation of an aircraft.

If this order is for an assembly containing replaceable sub-assemblies, a condition statement is required for each removable sub-assembly, if that sub-assembly has been removed and/or replaced by another sub-assembly.

2. Proof ascertaining where and when the supplier originally procured the part.
3. Traceable history providing objective evidence that the part was originally manufactured by one of the following sources:
  - a. The aircraft type certificate holder (i.e., MDC), or MDC approved source under a MDC Type or Production Certificate.
  - b. The Original Equipment Manufacturer (OEM) under an FAA approved Manufacturing system.
  - c. A supplier having Technical Standard Order (TSO) certification, provided the TSO covers/governs all characteristics required by the type design of the aircraft on which the part is to be installed.
  - d. A supplier granted Parts Manufacturer Approval (PMA) for the part.
4. Certification that the part has not been subject to severe stress or heat, as in a major engine failure, accident or fire.
5. For operating/functioning equipment: Certification from the testing agency (OEM or FAA Repair Station) that the part conforms to type design requirements.
6. If the part's status is "used", "rebuilt", "overhauled", "inspected", "modified", or "repaired" then a recent (less than 1 year) maintenance release, return to service tag, repaired parts tag, or similar document from an FAA certified agency must accompany the part. In addition, descriptive documentation describing the maintenance performed and parts replaced shall accompany the part along with the responsible persons signature attesting to such.
7. Components having life-limited items where the storage time, storage conditions, or shelf life is not known or certifiable (i.e. seals, o-rings, anti-friction bearings) shall be subject to the requirements as defined in '6' above.

The data package shall be delivered with the products to MDC or place of delivery as ordered. All documentation shall be subject to final approval by Quality Assurance. Additional requirements may be imposed subject to available documentation.

6304

#### CERTIFICATION FOR SELLER FURNISHED MATERIAL

Seller shall document and maintain a material certification containing the following:

1. Description of the material used in the manufacture of the end-item;
2. Material specifications;
3. Lot, Heat or batch number identification; and
4. Source of Procurement.

The certification shall be furnished separate from the packing sheet and shall reference the PO/Contract number and the applicable McDonnell Douglas Corporation (MDC) part number. In the event that Clause 6211 or 6243 is imposed, certification submittal to MDC is not required.

6306

SELLER EXECUTION OF CONFORMANCE CERTIFICATION  
(2/6/2004 REVISION)

Seller is required to deliver the supplies to be furnished hereunder with a "Certificate of Conformance". In no case shall the Buyer's right to inspect supplies under the inspection provisions of this contract be diminished. The Certificate, signed or stamped by an authorized agent of the Seller, shall be included with the shipping documentation (invoice/packing sheet). This Certificate shall contain equivalent information to the following statement:

"I hereby certify that on (date) the (contractor name) provided the supplies called for by Purchase Order Number (number) via (carrier) on (bill of lading or shipping document) in accordance with applicable requirements for shipment. I further certify that the supplies are of the quality specified and are in all respects in conformance with the contract requirements, including specifications and/or drawings, identification (part number), and in the quantity shown on this, or the attached acceptance document.

Specification does not contain an approved source requirement  
Specification does contain an approved source requirement

Approved source(s) used for this shipment;

Manufacturer \_\_\_\_\_

Address \_\_\_\_\_

Date of Execution: \_\_\_\_\_

Signature/Stamp:  
\_\_\_\_\_

Title:  
\_\_\_\_\_

If this Clause 6306 appears on purchase order and Supplier has been granted Supplier Inspection Delegation (SID) status (Clause 6243), Supplier acceptance stamp may be used as evidence of product acceptance in lieu of Conformance Certification statement required by this Clause 6306.

An MDC Quality Assurance Representative stamp may be used as evidence of product acceptance in lieu of Conformance Certification statement required by this Clause 6306. An MDC Quality Assurance Representative stamp is valid evidence of product acceptance with or without conformance certification statement required by this Clause 6306.

If Supplier has been granted SID status, or product is accepted by MDC Quality Assurance Representative at supplier facility (source inspected), supplier is not required to include with shipment to MDC; FAI Reports, Certificates of Conformance for Processes Requiring Boeing approval, or Acceptance Test Reports, unless notified otherwise by MDC.

NOTE: SID Seller shall continue to include with each shipment, Acceptance Test Reports (Ref. Clause 6320), and D1-4426 Process Certifications (Ref. Clause 6301), for parts designated Fracture Critical Category A or B

6307

SELLER EXECUTION OF CONFORMANCE CERTIFICATION FOR SOFTWARE  
( 1/5/2005 New)

Seller is required to deliver the supplies to be furnished hereunder with a "Certificate of Conformance". In no case shall the Buyer's right to inspect supplies under the inspection provisions of this contract be diminished. The Certificate, signed by an authorized agent of the Seller, shall be included with the shipping documentation (invoice/packing sheet). This Certificate shall contain equivalent information to the following statement:

"I hereby certify that on (date) the (contractor name) provided the supplies called for by Purchase Order Number (number) via (carrier) on (bill of lading or shipping document) in accordance with applicable requirements for shipment. I further certify that the supplies are of the quality specified and are in all respects in conformance with the contract requirements, including specifications and/or drawings, identification, and in the quantity shown on this, or the attached acceptance document.

I further certify that this software configuration item as adequately met all of its contractual requirements, except as stated in approved waivers, as is evidenced by the following events and information. Seller further certifies that this software and hardware configuration item(s) is safe for its intended use and is suitable for delivery to the United States Government and Buyer,

either as media or contained in;

LRU Part Number \_\_\_\_\_

LRU Serial Number \_\_\_\_\_

Software Version \_\_\_\_\_

Manufacturer \_\_\_\_\_

Address \_\_\_\_\_

Date of Execution: \_\_\_\_\_

Signature:  
\_\_\_\_\_

Title:  
\_\_\_\_\_

If Supplier has been granted SID status, or product is accepted by Buyer's Quality Assurance Representative at supplier facility (source inspected), Seller requirement to provide this certificate of conformance for software verification, as noted above remains in effect.

**6310 SELLER'S REPAIR DATA**

One copy of repair data is required and shall be sent directly to MDA - TA, ATTN: Warranty Administration, Department B11 (75-403). The data furnished shall include a list of the drawings, material specifications, overhaul procedures, processing, tests and inspections used/ accomplished for the repair. Copies of test results and raw material certifications shall be included for the repair. Copies of test results and raw material certifications shall be included. Completed Form DAC 28-555, "Repair Tag - Outside Work," is required.

**6315 SELLER'S REPAIR DATA FOR TEST AND EVALUATION**

Seller shall repair and test the item to ensure its continued operation to manufacturer's specifications. One copy of the repair data shall be included with the shipment.

**6320 ACCEPTANCE TEST REPORTS (10/23/2003 REVISION)**

Include with each shipment a copy, signed by an authorized agent of Seller, of the results of the lot or item acceptance tests required by the applicable specification. Where quantitative limits are established by the specification, the report shall indicate the actual values obtained. Test report shall include control identity (e.g., heat, lot, serial number) of material/item tested. Seller is required to maintain/retain inspection and test records as required by the PO/Contract.

In the event that QA Clause 6211 or 6243 is imposed, or for Repair Of Repairable (ROR) / Field Repair Purchase Order (FRPO) items, Seller 's test report submittal to MDC is not required with the shipment of parts.

NOTE: SID Seller (Ref. Clause 6243) shall continue to include with each shipment, acceptance test reports for parts that are designated Fracture Critical Category A or B

**6325 SELLER'S PRODUCT ACCEPTANCE DATA**

For articles, products and materials not of Buyer's design, the Seller shall deliver documentation that will enable the Buyer to perform a comprehensive acceptance inspection of the Seller's product. Seller shall provide to the Buyer, one of Seller's acceptance criteria (e.g., drawings, specifications, catalogs, etc.) which details performance, functional, dimensional and design characteristics. The data shall accompany the initial shipment of articles. In the event changes are made subsequent to initial submittal, revised acceptance/inspection data applicable to the new configuration shall be furnished with the next shipment.

**64XX FAA REQUIREMENTS**

**6401 FAA FIRST ARTICLE/MAJOR CHANGE CONFORMITY**

FAA conformity concurrence is required on the First Article and on each "major change" article, as defined in Federal

Aviation Regulations (FAR), Part 21.93, "Classification of Changes in Type Design." FAA Form 8130-3, "Airworthiness Approval Tag," shall be included with the shipment of each First Article or "major change" article.

**6402** FAA-REQUIRED APPROVAL - IMPORTED ARTICLES

FAA or foreign Government conformity concurrence is required on each imported article as defined in Federal Aviation Regulations (FAR), Part 21.502, "Approval of Materials, Parts, and Appliances." FAA Form 8130-3, "Airworthiness Approval Tag", or foreign Government equivalent shall be included with the shipment of each article.

**6403** FAA SERVICEABLE TAG

Seller shall affix a properly completed Serviceable Tag on each unit. The Tag shall identify the FAA-assigned number for the repair station and shall be signed by an authorized inspector (reference Federal Aviation regulations [FAR] 145.59). If Seller is the original manufacturer and elects to provide a new, replacement unit rather than to rework/repair the returned unit, Seller shall provide a statement on the shipper stating: "New Unit, P/N xxxx, Serial No. xxxx provided, No rework/repair accomplished, Clause 6403 not applicable."

**6404** SELLER COMPLIANCE WITH FAA FLAMMABILITY (LOW HEAT RELEASE) REQUIREMENTS

Seller shall create an FAA flammability control plan stating the details of the techniques to be used to ensure that materials and processes incorporated into articles furnished to MDC comply with FAA flammability regulations contained in Federal Aviation Regulation (FAR) 25.853.

The plan must be submitted to the MDC Purchasing Representative for approval by MDC Materials and Process Engineering (M&PE).

The plan shall include examples of the test data sheets to be used to record quantitative test values on sample test panels representative of the processes and materials used for construction of the end-item. Copies of completed test reports shall accompany shipments to MDC.

**6405** REQUIREMENT FOR FAA CONFORMITY INSPECTION

FAA/Foreign Civil Airworthiness Authority (FCAA) Conformity Inspection is required for articles specified on this Purchase Order/Contract. Notify Quality Source Surveillance Representative (QSSR) within 48 hours of receipt of this requirement to coordinate Boeing's involvement in completing and signing FAA Form 8130-9, Statement of Conformity.

Material review dispositions for articles designated for FAA Conformity Inspection must be submitted to the cognizant FAA Designated Engineering Representative (DER) at MDC for review; prior to issuance of FAA Form 8130-9, Statement of Conformity; when all of the following conditions apply:

- a. the disposition is use-as-is or repair, or proposes material substitution;
- b. the part/assembly is designated for FAA Conformity Inspection; and
- c. the part/assembly is to be used for FAA type certification testing.

Note: If the DER indicates that the disposition is likely to affect FAA type certification testing, contact the MDC cognizant engineer to determine further action.

SHIPMENT DOCUMENTATION

Include with each applicable shipment, a copy of FAA Form 8130-3, Airworthiness Approval Tag. FCAA equivalent to FAA Form 8130-3 is acceptable for imported articles.

**6406** REQUIREMENT FOR FAA AIRWORTHINESS CERTIFICATION

FAA Airworthiness Certification is required for articles specified in this purchase order. Include with each shipment, a true copy of FAA 8130-3, Airworthiness Approval Tag.

**6410** COST IMPACT - FOREIGN CIVIL AIRWORTHINESS CERTIFICATION

Parts and assemblies produced on this order may be subject to inspection by a Foreign Civil

Airworthiness Authority (FCAA) in accordance with U.S. Bilateral Agreement and Federal Aviation Regulations.

When such an inspection is required, the cost, if any, shall be borne by the Seller.

**65XX**

**MATERIAL/SAMPLES**

**6502**

**PRODUCTION TEST SAMPLES**

Seller shall furnish production test sample(s) as required by applicable Douglas Material Specification (DMS).

**66XX**

**WARRANTIES**

**6601**

**SELLER ACKNOWLEDGMENT**

Seller hereby acknowledges that the parts/materials ordered on this Purchase Order/Contract are for incorporation into an aircraft or will be used in the manufacture of, or maintenance of an aircraft. Seller warrants and represents that all parts/material delivered in accordance with this PO/Contract are of new manufacture and meet or exceed all specifications and requirements specified in this PO/Contract or referenced documents.

**6602**

**SELLER-DESIGNED PART OR ASSEMBLY**

Seller warrants that the part or assembly is of Seller's design, is an off-the-shelf item/commercially available part, and meets all of Seller's drawing and specification requirements. The part or assembly is subject to MDC Inspection/Testing at MDC to verify conformance. Nonconformance articles will be returned to Seller, at no cost to MDC, for replacement/credit.

**67XX**

**CONTROL REQUIREMENTS**

**6701**

**CONTROL IDENTIFICATION**

1. Seller shall include on the shipping document (invoice/packing sheet) and/or test report the control identity for the material being shipped. When test report is not required by the PO/ Contract, the control identity shall be on the shipping document. The control identity is, as applicable, the manufacturing date, lot, batch, heat, and/or serial number. When multiple lots are included in one shipment, Seller shall separate and identify respective lots, and indicate each lot quantity. Where serial numbers are used, Seller shall also comply with the requirements of DPS 3.02-17, Identification of C-17 Parts and Assemblies – Military, when specified by contract.

Note: This does not apply to fracture critical parts. (Refer to Drawing 17P9M2005 for requirements).

**6702**

**REGISTERED COMPONENTS CONTROL AND TRACEABILITY**

Seller shall maintain detailed records on each serialized component documenting the methods and processes used to maintain control and traceability or registered components. Seller shall submit a written plan to MDC through the MDC Purchasing Representative for QA analysis and acceptance of the following:

1. The methods and the type of all processing to be used;
  2. The location within the processing cycle where inspections will take place;
  3. The attributes of the products which will be inspected at each inspection point;
  4. The materials and methods of preservation and packaging to be used to protect the product; and
  5. The handling and transportation precautions necessary to protect the product.
- Revision or variation to any of the above-listed controls shall not take place until MDC has accepted the revision.

**6703**

**FOREIGN OBJECT DAMAGE/CONTROL**

Seller shall establish and maintain systems and procedures necessary to provide a definitive program of foreign object damage/control. The procedure/plan must be developed within 60 days of the date of this PO/Contract, and be available to the MDC Purchasing Representative upon request. MDC reserves the right to reject Seller's foreign object damage control procedure/plan.

**6710** MATERIAL TRACEABILITY (13 Dec 2002, REV)

Identification of each piece of material and each report is required by specification to provide traceability to heat, lot or batch number.

**6711** HEAT, LOT OR BATCH NUMBERS FOR REWORKED MATERIALS (13 Dec 2002, REV)

Seller shall assign a new heat, lot, or batch number to material reworked in accordance with Buyer instructions. Seller shall maintain records to show traceability to original material, indicating quantity reworked and subsequently returned to Buyer. All reworked material shall be identified with only the new heat, lot or batch number. Seller's shipping document shall note both new and superseded heat, lot, or batch number.

**6720** FRACTURE CRITICAL PARTS

Seller shall comply with the requirements of the following MDC drawings in support of the C-17 Program.

17P9M2004 Control of Fracture and Durability Critical Parts

17P9M2005 Traceability and Serialization of Fracture Critical Parts

Record Submission

Seller shall complete Form DAC 26-0902 entitled "MANUFACTURER OF C-17 FRACTURE CRITICAL CAT. A&B METALLIC PARTS DATA INFORMATION LOG", or Form MD-2449 entitled "MANUFACTURER OF C-17 FRACTURE CRITICAL CAT. A&B NONMETALLIC (COMPOSITE) PARTS DATA INFORMATION LOG", as required, and submit the appropriate form to MDC Data Management utilizing Supplier/Component Data Transmittal Form MD-2032 or Form MD-2032-01, as applicable. Unless otherwise directed in the Purchase Order, the Seller shall send the appropriate forms set forth above to MDC Data Management at the following address:

McDonnell Douglas Corporation  
Attention: Data Management  
Mail Code: C054-0031  
2401 E. Wardlow Road  
Long Beach, CA 90807-4418

Unit Serial Numbers

In Accordance with the traceability and serialization requirements defined in MDC drawing 17P9M2005, the Unit Serial Numbers set forth on the purchase order or in an attachment thereto, have been provided by MDC Configuration Management for the Seller's use for the fracture critical parts (category A&B) purchased hereunder.

Repairs Under FRPOs

Delivered items to be repaired under a Field Repair Purchase Order (FRPO) contain fracture/durability critical parts/components. Seller shall contact Buyer to obtain Buyer's Liaison Engineering analysis for Damage and Durability Tolerance (D&DT) and deposition prior to starting any work on the fracture/durability part/component.

**6721** IDENTIFICATION AND SERIALIZATION

A. General

The Seller shall serialize all functional end-items delivered when specified by drawing or as specified by terms of the contract. The Seller shall further serialize such lower level items as switches, relays, valves, topic cards, solenoids, regulators, pyrotechnic devices and high order assemblies on which such items are used, up to and including the end-items.

B. Requirements

- 1) The Seller shall maintain records on such items to provide positive correlation

between item serial number and:

- a. Design details including minor changes which do not require part number change.
  - b. Material and material changes.
  - c. Fabrication and assembly processes and changes thereto.
  - d. Inspections and tests performed.
- 2) Two-way traceability from the part to the process, and from the process to the affected parts is required. Such information shall be immediately available to MDC upon request.
- 3) The Seller shall maintain records of usage of such parts on the higher order assemblies up to and including the end-item delivered under terms of the contract. These records shall also provide two-way traceability from end-items to the lowest level serialized part and from the latter up to the end-item.

**6722** ROLL SORTING OF RIVETS

Seller shall perform "roll sorting" of rivets in this PO/Contract and shall provide identity on each unit package that "roll sorting" has been accomplished.

**6730** ELECTROSTATIC DISCHARGE (ESD) - DPS 1.34-52

Seller shall establish and maintain a program for the protection of Electrostatic Discharge (ESD) sensitive components, devices, and assemblies in accordance with Douglas Process Standards (DPS) 1.34-52. ESD warning notes shall be included on all assembly drawings. All ESD workstations shall be clearly labeled and equipped with records of inspection and certification. All components, devices, and assemblies shall be properly labeled and identified as required. All Applicable Line Replaceable Units (LRU) shall contain ESD warning labels and conductive protective connector caps. Warning labels and conductive caps shall be included on parts lists. Seller shall incorporate this Clause in all lower-tier subcontracts.

**6731** SELLER'S INSPECTION STAMP CERTIFICATION

Seller's inspector shall stamp to the right of each Seller-accomplished operation on the Material Procurement Copy (MPC) Fabrication Outline (FO) or Seller's equivalent shop traveler. In addition, Seller's Inspector shall stamp to the right of each established inspection operation on the MPC FO, or Seller's equivalent shop traveler, to certify the quality and completeness of the work operation being performed. When MDC Source Inspection is required by the PO/ Contract, MDC's source inspector shall stamp to the right of each designated MDC source inspection sequence on the MPC FO, or on Seller's shop traveler, and on the Seller's packing sheet that accompanies each shipment to MDC.

**6732** MODEL BASED DEFINITION (MBD) – QUALITY REQUIREMENTS

Seller compliance to D6-51991

Seller shall follow one of two processes:

1. Suppliers with 3D MBD approval as defined in Boeing's PQAA/DOLS (these suppliers have the authority to create inspection media used for final acceptance of digitally defined product, therefore suppliers are not required to send any data for approval).

Approval indicates that Boeing Supplier Quality has performed a DPD / 3D MBD indepth assessment of seller's capability for the receipt, usage, and distribution of electronic product definition data sets. Also has assessed the implemented procedures to assure valid configuration control throughout all operations utilizing digital data, and has verified the required documentation of digital operations and the responsibilities of Quality personnel for the control of them. Boeing reserves the right to conduct surveillance at Seller's facility to determine that Seller's Quality Assurance Standard for Digital Product Definition meets the requirements as set forth herein.

Note: Seller producing 3D MBD parts shall develop and maintain a process as defined in D6-51991, Quality Assurance Standard for Digital Product Definition (DPD) at Boeing Suppliers and not be limited to element sections 1.0, 2.0, 4.0, 5.0, 8.0, 9.0, and 11.0 contained within D6-51991. A copy of D6-51991, including all appendices and addenda can be obtained at the following URL address:

<http://www.boeing.com/companyoffices/doingbiz/supplier/>

2. Suppliers without 3D MBD Approval (these suppliers do not have the authority to create inspection media used for final acceptance of digitally defined product) Seller should utilize document D6-51991 as a Quality Assurance Standard for Digital Product Definition at Boeing Suppliers (element sections 1.0, 2.0, 4.0, 5.0, 8.0, 9.0, and 11.0) for implementation of digital data control processes. A copy of D6-51991, including all appendices and addenda can be obtained at the following URL address: <http://www.boeing.com/companyoffices/doingbiz/supplier/> Seller shall create and submit inspection media to Boeing C-17 Supplier Quality for verification and approval a minimum of two (2) weeks prior to inspection and authorization for shipment of 3D MBD parts. The Seller inspection media shall include Coordinate Measurement Machine (CMM) points and or all conventional inspection (I. E drawing, sketches, screen print outs, fixtures etc.). This media must include but not be limited to the minimum requirements of DPS 4.710-3-17. Inspection characteristics must ensure that the product meets engineering design as shown by the 3D master model.

- a. The inspection media will describe the step by step inspection to be accomplished at each point of in-process inspection.
- b. Inspection media can be used for the final acceptance of digital product during FAI.
- c. All data will be verified and compared to the Master Model. An approval letter will be issued specifying part number and revision level in effect at the time inspection media approval.

Note: Dimensions, tolerances and other features of the part that are contained in the Inspection Criteria generated by supplier must be generated from the released 3D model. Only Boeing C-17 Supplier Quality approved media may be used to accept 3D MBD parts.

For example: Approval for inspection tools.

*Supplier is to submit, either one of the following:*

- A. Tool Design prior to manufacture (to minimize risk of manufacturing a nonconforming tool).
- B. Actual inspection data after manufacturing of tool. Note: All suppliers with DPD/MBD process approvals dated before April 2002 will require MBD re-assessment.

**6740**

#### PRODUCTS CONTAINING RAW MATERIAL FROM FOREIGN PRODUCERS (DMS 2201)

Products delivered to MDC containing metallic raw material from foreign producers shall include with each shipment a certification listing the material and the foreign producer's name and address. The certification shall include reference to Douglas Material Specification (DMS) 2201 and be signed by an authorized Quality Assurance Representative of the Seller. Evidence of compliance with DMS 2201 must be maintained on file at Seller's facility for four (4) years from the date of manufacture of the article concerned and shall be available for MDC review upon request.

**6750**

#### INTERFACE KEY CHARACTERISTICS IDENTIFICATION AND CONTROL

The Seller and MDC shall jointly identify interface key characteristics in accordance with the definition below. Seller shall effectively control variation in each interface key characteristic such that the nominal design/target value is approached. Requirements for control shall include the following:

- a) Identify each Interface Key Characteristic at the interface of the Seller's product and the C-17 aircraft; Seller's product and the tools; Seller's product and the test equipment;
- b) Identify and document each of the manufacturing processes associated with each identified Interface Key Characteristic;
- c) Determine the present manufacturing process capability (Cpk or equiv.) for manufacturing process associated with each identified Interface Key Characteristic;
- d) Document process control plan for production manufacturing processes associated with each identified Interface Key Characteristic. This includes continuous control over unstable processes to discover and eliminate special causes of defects;
- e) Apply Process Variability Reduction Techniques as required for each identified Interface Key Characteristic;
- f) Determine the improved capability for each Interface Key Characteristic. A capability index shall be used to monitor improvements;
- g) Participate with MDC in establishment and implementation of metrics that measure the performance of the Interface Key Characteristics control system.

DEFINITIONS:

**Interface Key Characteristic** - Those features of a part, assembly or operational system which define function and fit at the interface between the C-17 aircraft and the Seller's product; the assembly/fabrication tools and the Seller's product; the assembly/ fabrication test equipment and the Seller's product. For each interface key characteristic, the variation shall be controlled such that the characteristic nominal design/target value is closely approached. These characteristics may affect fit, form orientation , location with the assembly tools and in parts fabrication processes, and performance of mechanical/electrical subsystems in functional checkout testing.

**Variation** - That deviation of a characteristic value about the nominal design/target value. The variation is controlled by adjusting the processes associated with the interface key characteristics such that the nominal/centerline value is closely approached.

**Process Capability Standard (Cpk)**- An index providing a relationship between the process variation and the tolerance limits. When the process is near normal distribution and in control, the CpK is useful in estimating whether the process will produce conforming units.

68XX

RESERVED

69XX

OTHER

6901

B-1B FRACTURE CONTROL PARTS SUPPLEMENTAL QUALITY REQUIREMENTS FOR PURCHASED PARTS OR LABOR

For all "Fracture Control" parts whether identified as Fracture Control Category I or II, the following shall apply:

A. Seller shall notify Buyer three (3) days prior to the start of any machine operations, for coordination and preparation of Supplier Material Processing Procedures (SMPP) for Buyer's Quality Engineering review and approval. Buyer will supply Material Process Specifications (MPS) and Inspection Instructions (II).

B. Suppliers not previously approved for critical machining of B-1B parts shall submit a SMPP to Buyer for approval in concurrence with procedures for finish machining of parts to applicable Material Process Specifications (MPS).

C. Seller shall notify Buyer of the name (s) of intended sources to be used for non destructive testing (NDT) prior to placing work with a NDT source. A special survey for processing fracture control parts at the approved NDT facilities must be conducted by Buyer' s Quality Assurance to verify the capability of a supplier to inspect to Buyer's Inspection Instructions ( II). The supplier and/or his NDT inspection source will be required to inspect to Buyer's Inspection Instructions (II) in addition to being listed as a Certified Special Processor.

D. Seller must maintain identity and traceability of Category I parts throughout all phases of manufacture and processing. Traceability will include the Buyer assigned material lot number and item serial number. Seller shall list on the packing sheet the serial number/lot number for all Category I fracture control parts for each line item shipped.

6902

SUPPLMENTAL QUALITY REQUIREMENTS FOR B-1B DIE FORGINGS, FORGED SHAPES, HAND FORGED BILLET, PLATE BAR AND EXTRUSIONS WITH FRACTURE TOUGHNESS REQUIREMENTS (13 Dec 2002, REV)

Nondestructive Testing (NDT)

A. General

Sources: Only those NDT facilities (sources) specifically approved by the Buyer are authorized to perform nondestructive testing.

B. Procedures

All nondestructive testing of material with fracture toughness requirements shall be performed in accordance with written procedures prepared by seller and approved by Buyer. Approval of the written procedures must be obtained from the Buyer prior to the initial inspection. If Seller does not elect to write its own procedures Buyer's approved procedures must be used. The type of nondestructive testing used (i.e., ultrasonic, magnetic particle, penetrant, eddy current radiographic) shall be in accordance with Buyer's specifications and drawings, or as called for on the purchase order.

Inspection Scan Plan: In addition to the written procedures described above, when ultrasonic inspection is required, and ultrasonic inspection scan plan indication the ultrasonic coverage shall be prepared by Seller and approved by Buyer for each forged part number (see note 1) and each extrusion shape number, billet and bar excluded ( see note 2

). Scan plan approval must be obtained from Buyer prior to the initial inspection.

NOTE 1: Ultrasonic inspection may be accomplished on the forging because of surface finish, size or complexity. An ultrasonic scan plan of the preform shall be submitted for Buyer approval as required above.

NOTE 2: Plate bar billet, rolled or forged, requires only an ultrasonic test procedure for Sonic test procedure for approval per paragraph B ultrasonic scan plans for wrought product forms are not required.

Records and Certifications: The number, revision letter, and date of the approved nondestructive testing procedure and the ultrasonic inspection scan plan, when applicable, must be noted on Seller's records and the certification (s) submitted to Buyer with the material.

**6907**

#### SELLER CORRECTIVE ACTION VERIFICATION (13 Dec 2002, NEW)

Seller is required to provide objective evidence to Buyer (Boeing Supplier Quality Assurance) that Seller's corrective action implementation and effectivity for the noted rejection, and Supplier Corrective Action Notice (SCAN, if issued) has been accomplished. Seller's acceptance stamp, if Seller has delegated inspection authority under Supplier Inspection Delegation (SID) Program, or Boeing Source Inspection stamp, may serve as Seller's certification that all Corrective Actions have been completed.

**6910**

#### QUALITY REQUIREMENTS REVIEW

Buyer's Supplier Quality Representative will conduct a Quality Requirement Review (QRR) with Seller to establish confidence that Seller understands quality requirements imposed on this contract.

Buyer's Supplier Quality Representative will coordinate with Seller to schedule the QRR as an early involvement activity, intended to be performed prior to start of manufacturing of Goods.

Seller shall make records of review of contract requirements readily available at time of QRR. Buyer reserves the right to review Seller's flow-down of quality requirements to Seller's subcontractor(s).