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## Document Information

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## 1.0 Introduction and General Requirements

### 1.1 Introduction

This document defines The Boeing Company quality requirements for Production Equipment, Special Tooling (ST) and Special Test Equipment (STE). These requirements are established for control by means of a recognized Quality Management System (QMS) and requirements contained in – Requirements for Aviation, Space and Defense Organizations; and Federal Acquisition Regulation (FAR), Part 45 and Part 52.245-1 (Government Property); Defense Federal Acquisition Regulations Supplement (DFARS) 252.245; Federal Aviation Regulation, Title 14: Part 21, Subpart G, “Production Certificates”; including sanctioned International Aerospace Quality Group (IAQG) AS/EN/JISQ 9100 Quality Management System (QMS) standards.

This document applies to all Boeing-owned assets, Government-owned assets and Seller-owned assets that are accountable to The Boeing Company. Boeing procurement may include asset design/definition, fabrication, inspection, maintenance items, and can include assets used to produce product during the execution of a Boeing Purchase Contract by the Seller and/or their subcontractors. This document is not intended to contradict any Boeing or Government Property Management requirements for assets. Seller must formally address any conflict of requirements with Buyer’s Authorized Procurement Agent (APA) reference section 1.4 (Seller Communication).

This document applies to all asset types that include Special Tooling (ST) including mylar type layouts; Special Test Equipment (STE); and Production Equipment, including Overhead Mechanical Handling Equipment. Property and/or materials excluded from this requirement include:

1. Capital Equipment.
2. Portable/Perishable Tools, Hand Tools or General Purpose Equipment.
3. Shop Aid / Manufacturing Aid type assets.
4. Seller defined and owned assets. (see sec. 4.3 for specific applicability)
  - a. Seller defined and owned assets used to produce Boeing product must meet all configuration, usage, document control and verification requirements as defined in AS/EN/JISQ 9100 Quality Management System (QMS) standards.

### 1.2 General Requirements

This document applies to all Boeing owned assets and Government owned assets accountable to Boeing. This includes Boeing provided Asset Engineering Design/Definition being used to realize Seller owned and Seller accountable assets used to produce Boeing products.

All assets must meet the requirements as defined in a Boeing approved Purchase Contract. The following may be in part or fully imposed as part of a Purchase Contract: Special Business Provision (SBP), D33200-1 (Boeing Supplier’s Tooling), Supplier Specification Plan (SSP), Statement of Work (SOW), D33207-1 (Supplier Statement of Work for Special Tooling and Special Test Equipment - BDS, BR&T, BT&E, BGS (Government Programs), Asset Design/Definition and/or Product Engineering Definition.

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When imposed contractually, Seller must comply with the requirements of this document for the following:

- Define, fabricate, rework, modify, receive, use, maintain, and/or store an asset during the performance of a Purchase Contract or during sustained procurement that requires the continued use of Boeing accountable assets.
- Define, fabricate, rework, modify and delivery of an asset during Purchase Contract execution.

The Seller is required to have a current AS9100 certificate from a Boeing recognized certification body when a Seller receives, uses, maintains, and/or stores a Boeing accountable asset in support of a Boeing Purchase Contract.

The Seller is required to have a current AS9100 certificate or an accredited Quality Management System (QMS) certification issued by an accredited Certified Body where a tooling capability is defined within the Certificate Scope or must satisfy documented information requirements per section 2 (Seller Capability) Table 1 (Design/Definition – Fabrication, Rework, Modification – Inspection/Verification) and Table 2 (Design Only and/or Fabrication Only) when Seller:

- Defines, fabricates, reworks, modifies and delivers an asset during Purchase Contract execution.

Seller including all Seller sub-divisions and subsidiaries must maintain documented information, processes, training and equipment to implement and maintain the requirements of this document, this includes any Seller capability used to realize, conform, configure, or accept Boeing accountable assets. Seller's internal audit process must include the requirements of this document and be performed in accordance with existing Quality Management System (QMS) requirements.

Boeing reserves the right to conduct surveillance at Seller's facilities, including interdivision facilities and subcontractors regardless of Quality Management System (QMS) dependency to determine the contracted Seller's compliance to the requirements of this document. Boeing also reserves the right to make the final determination of the Seller's asset engineering definition, fabrication, inspection, and acceptance capabilities. (Reference Section 2.0 Table 1 and Table 2 for the "Capability Level / Approval Type" matrix). Seller's recognized asset capabilities are documented and maintained in Boeing's supplier quality data system.

Boeing accountable assets provided in support of Boeing Purchase Contracts must be used for product realization and must be controlled in accordance with this document. Sellers identifying alternate methods of product realization in lieu of Boeing accountable assets (Ref. section 15.2 H&I), must obtain formal authorization (ref. section 1.4 Seller Communication). Assets not in use must be processed per Purchase Contract closeout requirements (Ref. E000 Supplier Requirements for Buyer/Government/Customer Property Management and/or D33113-1 Accountability of In-Plant/Out-Plant Special (Contract) Tools) or formally submit request for excess asset disposition (ref. section 1.4 Seller Communication).

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Seller must provide written notice (ref. section 1.4 Seller Communication) of any proposed plans for moving Seller's manufacturing location or moving assets or other equipment utilized in the manufacture of the Boeing product to another facility. In no event must Seller proceed with implementing such plans prior to obtaining prior written approval (ref. section 1.4 Seller Communication).

Seller is required to formally communicate within 30 days (ref. section 1.4 Seller Communication) for evaluation of potential impact to Boeing recognized asset capabilities when changes to Seller's organizational structures, staffing levels, training, processes, procedures, including Quality Management System (QMS), equipment or infrastructure occur.

If during Boeing Purchase Contract execution the Seller or its subcontractors are not capable of performing a required asset function or capability, Seller must immediately and formally contact Boeing (ref. section 1.4 Seller Communication) for resolution.

### **1.3 Subcontractor General Requirements**

Boeing reserves the right to conduct surveillance at Seller's facility including Seller's interdivision facilities where asset work transfers occur. Boeing also reserves the right to conduct surveillance at Seller's subcontractors and any subsequent subcontractors where asset work transfer occurs in support of a Boeing Purchase Contract.

Seller must impose and flow down the requirements contained in this document to all subcontractors and subdivisions where Boeing assets are procured, transferred, and/or used in support of Boeing Purchase Contracts. Seller is responsible for subcontractor conformance to the requirements of this document. This includes interdivision asset transfers where interdivision quality system is independent and a Boeing recognized asset capability is not active.

Where Seller does not maintain proficiency to determine a subcontractor's capability (Ref. section 2.0 – Seller Asset Capability) to support a Boeing accountable asset, Seller must formally contact Boeing (ref. section 1.4 Seller Communication) to request assistance/guidance in subcontractor capability determination.

When Seller is not capable of performing asset process-initial fabrication, rework, modification, acceptance, or periodic inspection the Seller must take the appropriate actions to ensure asset process is accomplished.

Typical options include:

1. Shipping asset to Boeing.
2. Asset process performed by Boeing at Seller's site.
3. Third-party asset process arranged by seller.

If asset inspection or acceptance is delegated by the Seller, all inspection and acceptance must be in compliance with section 8.0 (Acceptance) of this document. For Boeing identified configuration critical assets, inspection or acceptance delegation requires prior written technical approval (ref. section 1.4 Seller Communication).



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Excluding Boeing capability assessments, the Seller is responsible for having a documented process to determine third-party capability when engaging a third party per section 2 (Seller Asset Capability) and section 1.3 (Subcontractor General Requirements) and any applicable Boeing contractual requirements.

The Seller's subcontractors, including interdivisions asset capability determination, evaluation and approval is the responsibility of the Seller and must satisfy established Quality Management System (QMS) requirements for Control of Externally Provided Processes, Products, and Services and must be in compliance with requirements in this document. The Seller must demonstrate to Boeing with objective evidence that the Seller's subcontractors and Seller interdivision approvals are acceptable with regard to asset capability and compliance requirements.

Seller may acknowledge an existing asset capability approval maintained by a subcontractor. Subcontractors asset capability recognition is the responsibility of Seller and must satisfy the requirements of this document and established Quality Management System (QMS) requirements. Seller is required to maintain objective evidence of subcontractor approval. Documented information of the subcontractors third party approvals, are recognized, as asset capability, and asset controls when applicable.

#### **1.4 Seller Communication**

When formal customer communication is required in support of a Purchase Contract, Seller must submit formal written request for support. Where contract requirements identify direct Boeing technical support, formal request will be directly submitted to Boeing Authorized Technical group in addition to Buyer's Authorized Procurement Agent (APA). When instructed, Seller will submit Technical Supplier Information Request (TSIR) when formal technical instructions are needed to satisfy contract.

When instructed or required by a Purchase Contract (Ref. section 1.2 General Requirements), Seller must submit any required asset documents, data, results or reports through Boeing's approved electronic data system (e.g., Supplier Data Requirements List (SDRL), Customer/Supplier Data Transmittal (CSDT), Integrated Data Management System (IDMS), Vendor Inventory Process (VIP), authorized secured transmittal platform (e.g. Message Courier).

## 2.0 Seller Asset Capabilities

### 2.1 Scope

This section defines a consistent method of determining the technical and process control capability of a Seller relative to the asset engineering design/definition, fabrication, inspection, acceptance, usage, and maintenance.

### 2.2 Requirements

- A. Seller's capabilities to perform necessary elements of asset management throughout the life cycle of assets will be evaluated, assessed, and tracked by Boeing.
- B. Seller must demonstrate proficiency to Boeing using the capability requirements defined in Table 1 (Seller Approval Capability Level Requirements), and any specific asset requirements defined in Purchase Contract, before performing a function listed below:
  1. Engineering Design/Definition. (Section 4)
  2. Fabrication, Rework, or Modification. (Section 6)
  3. Conventional and digital measurement and physical coordination. (Section 6, 7, 8, 9)
  4. Visual and dimensional inspection. (Section 8, 9)
  5. User / Condition Check. (Section 10)

<b>Table 1: Seller Approval Capability Level Requirements</b>				
<b>Approval Capability Level</b>	<b>Design / Definition</b>	<b>Fabrication, Rework, or Modification</b>	<b>Inspection / Verification</b>	<b>User / Condition Check</b>
Documented Information Required for Approval:				
Configuration Management (Ref. Section 3)	X	X	X	X
Design/Definition (Ref. Section 4)	X			
Data Elements (Ref. Section 5)	X	X	X	X
Fabrication, Rework, and Modification (Ref. Section 6)		X	X	
Special Process (Ref. Section 7)		X	X	
Acceptance (Ref. Section 8)		X	X	X
Periodic Inspection (Ref. Section 9)			X	X
Each Use Condition Check (Ref. Section 10)		X	X	X
Manufacturing Work Instructions (Ref. Section 11)				X
Production Process Verification and Asset Relationship (Ref. Section 12)	X	X	X	X
Preventive Maintenance (Ref. Section 13)		X	X	X
Protection and Storage (Ref. Section 14)		X	X	X
Nonconforming Assets (Ref. Section 15)	X	X	X	X
Potential Product Impact (Ref. Section 16)	X	X	X	X
Receiving and Shipping (Ref. Section 17)		X	X	X

<b>Post Production and Spares (Ref. Section 18)</b>		<b>X</b>	<b>X</b>	<b>X</b>
<b>Records Requirements (Ref. Section 19)</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
<b>How to read table</b>				
<ul style="list-style-type: none"> <li>• Top row defines levels of approval and capability types. (note: Seller may be approved to one or multiple Discipline Categories)</li> <li>• Left Column defines documented information required to meet a desired capability and approval type.</li> <li>• Process documented information required “X”</li> </ul>				

C. Seller must develop and maintain documented information for Boeing Asset Approval recognition per requirements defined in Table 2 (Seller Asset Approval Type /Documented Information Requirements), and any specific asset requirements defined in Purchase Contract, as listed below:

<b>Seller Types:</b>	<b>Receive/Use/Maintain</b>	<b>Design only</b>	<b>Fabrication only</b>
<b>Seller Procedure Requirements:</b>			
<b>General Requirements</b>	<ul style="list-style-type: none"> <li>• Maintain accredited QMS certification</li> <li>• Sub tier approvals for offload of asset services</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain accredited QMS certification</li> <li>• Sub tier approvals for offload of asset services</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain accredited QMS certification</li> <li>• Sub tier approvals for offload of asset services</li> </ul>
<b>Section 3 Configuration Management</b>	<ul style="list-style-type: none"> <li>• Sec. 3.2 – Configuration Management Requirements</li> <li>• Sec. 3.2.1 - Boeing-defined</li> <li>• Sec. 3.2.2 - Seller-defined</li> <li>• Sec. 3.3 - Seller Asset Periodic Inspections and Asset Acceptance</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 3.2 – Configuration Management Requirements</li> <li>• Sec. 3.2.1 - Boeing-defined</li> <li>• Sec. 3.2.2 - Seller-defined</li> <li>• Sec. 3.3 - Seller Asset Periodic Inspections and Asset Acceptance</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 3.2 – Configuration Management Requirements</li> <li>• Sec. 3.2.1 - Boeing-defined</li> <li>• Sec. 3.2.2 - Seller-defined</li> <li>• Sec. 3.3 - Seller Asset Periodic Inspections and Asset Acceptance</li> </ul>
<b>Section 4 Design/Definition</b>	<ul style="list-style-type: none"> <li>• Sec. 4.2. - Design Procedure Requirement</li> <li>• Sec. 4.3. – Design Approval</li> <li>• Sec. 4.4 – Design Requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 4.2 - Design Procedure Requirement</li> <li>• Sec. 4.3 – Design Approval</li> <li>• Sec. 4.4 – Design Requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 4.2 - Design Procedure Requirement</li> <li>• Sec. 4.3 – Design Approval</li> <li>• Sec. 4.4 – Design Requirements</li> </ul>
<b>Section 5 Data Elements</b>	<ul style="list-style-type: none"> <li>• Sec. 5.2 - Data Element Requirements</li> <li>• Sec. 5.3 - Asset Specification/Engineering Requirements</li> <li>• Sec. 5.4 - Asset Identification</li> <li>• Sec. 5.5 – Asset Usage Instructions</li> <li>• Sec. 5.6 Periodic Inspection Plans</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 5.2 - Data Element Requirements</li> <li>• Sec. 5.3 - Asset Specification/Engineering Requirements</li> <li>• Sec. 5.4 - Asset Identification</li> <li>• Sec. 5.5 – Asset Usage Instructions</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 5.2 - Data Element Requirements</li> <li>• Sec. 5.3 - Asset Specification/Engineering Requirements</li> <li>• Sec. 5.4 - Asset Identification</li> </ul>
<b>Section 6 Fabrication, Rework, and Modification</b>	<ul style="list-style-type: none"> <li>• Sec. 6.2 – Requirements</li> <li>• Sec. 6.3 - Initial Fabrication, Rework and Modification</li> <li>• Sec. 6.4 – Asset Material</li> <li>• Sec. 6.5 - Coordinate Measuring Systems (CMS) Measurement</li> <li>• Sec. 6.6 Master Coordination</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 6.2 – Requirements</li> <li>• Sec. 6.3 - Initial Fabrication, Rework and Modification</li> <li>• Sec. 6.4 – Asset Material</li> <li>• Sec. 6.5 - Coordinate Measuring Systems (CMS) Measurement</li> <li>• Sec. 6.6 Master Coordination</li> </ul>
<b>Section 7 Special Processes</b>	<ul style="list-style-type: none"> <li>• Sec. 7.2 – Special Process Requirements</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 7.2 – Special Process Requirements</li> </ul>
<b>Section 8 Acceptance</b>	<ul style="list-style-type: none"> <li>• Sec. 8.2 – Requirements</li> <li>• Sec. 8.3 - Asset Acceptance Methods</li> <li>• Sec. 8.4 - Proof Load Test</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 8.2 – Requirements</li> <li>• Sec. 8.3 - Asset Acceptance Methods</li> <li>• Sec. 8.4 - Proof Load Test</li> </ul>
<b>Section 9 Periodic Inspection</b>	<ul style="list-style-type: none"> <li>• Sec. 9.2. - Requirements</li> <li>• Sec. 9.3 - Periodic Inspection Plans</li> </ul>		
<b>Section 10 Each Use Condition Check</b>	<ul style="list-style-type: none"> <li>• Sec. 10.2 - Requirements</li> </ul>		

<b>Section 11 Manufacturing Work Instructions</b>	<ul style="list-style-type: none"> <li>• Sec. 11.2 - Requirements</li> </ul>		
<b>Section 12 Production Process Verification and Asset Relationship</b>	<ul style="list-style-type: none"> <li>• Sec. 12.2 - Requirements</li> <li>• Sec. 12.3 - Communication</li> </ul>		
<b>Section 13 Preventive Maintenance</b>	<ul style="list-style-type: none"> <li>• Sec. 13.2 - Requirements</li> <li>• Sec. 13.3 - User Maintenance</li> <li>• Sec. 13.4 - Preventive Maintenance</li> <li>• Sec. 13.5 - Preventive Maintenance Plans</li> </ul>		
<b>Section 14 Protection and Storage</b>	<ul style="list-style-type: none"> <li>• Sec. 14.2 - Requirements</li> <li>• Sec. 14.3 - Asset In Use</li> <li>• Sec. 14.4 - Asset Not In Use</li> <li>• Sec. 14.5 - Storage</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 14.2 - Requirements</li> <li>• Sec. 14.3 - Asset In Use</li> <li>• Sec. 14.4 - Asset Not In Use</li> <li>• Sec. 14.5 - Storage</li> </ul>
<b>Section 15 Nonconformance</b>	<ul style="list-style-type: none"> <li>• Sec. 15.2 - Requirements</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 15.2 - Requirements</li> </ul>
<b>Section 16 Potential Product Impact</b>	<ul style="list-style-type: none"> <li>• Sec. 16.2 - Requirements</li> </ul>		
<b>Section 17 Receiving and Shipping</b>	<ul style="list-style-type: none"> <li>• Sec. 17.2 - Requirements</li> <li>• Sec. 17.3 - Receiving</li> <li>• Sec. 17.4 - Shipping</li> </ul>		<ul style="list-style-type: none"> <li>• Sec. 17.2 - Requirements</li> <li>• Sec. 17.3 - Receiving</li> <li>• Sec. 17.4 - Shipping</li> </ul>
<b>Section 18 Post Production and Spares</b>	<ul style="list-style-type: none"> <li>• Sec. 18.2 - Requirements</li> </ul>		
<b>Section 19 Records Requirements</b>	<ul style="list-style-type: none"> <li>• Sec. 19.2 - Requirements</li> <li>• Sec. 19.3 - Records</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 19.2 - Requirements</li> <li>• Sec. 19.3 - Records</li> </ul>	<ul style="list-style-type: none"> <li>• Sec. 19.2 - Requirements</li> <li>• Sec. 19.3 - Records</li> </ul>
<b>How to read table</b>			
<ul style="list-style-type: none"> <li>• Top row defines levels of Discipline Categories (note: Seller may be approved to one or more Discipline Categories)</li> <li>• Left Column defines documented information required to meet Discipline Category compliance.</li> <li>• Section criteria defines the minimum process compliance to achieve approval.</li> </ul>			

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## 3.0 Configuration Management

### 3.1 Scope

This section establishes standardized asset configuration management requirements and objectives based on principles that ensure products and services meet customer, Boeing, and regulatory requirements throughout asset lifecycle.

### 3.2 Requirements

- A. The Seller is required to create documented information to control Configuration Management processes of all assets and has clear requirements that define the roles and responsibilities established for:
  - 1. Documented Information for Requirements, Specifications, Design/Definition, Verification, Validation, and Acceptance.
  - 2. Planning.
  - 3. Identification and Traceability.
  - 4. Change Control and Variance Management.
- B. Seller must ensure that all assets are at the designated configuration levels/revisions for the part or assembly being produced, or the installation being performed. When appropriate, Seller must initiate coordination and negotiation with Boeing (ref. section 1.4 Seller Communication) for proper configuration alignment.

#### 3.2.1 Boeing-defined Assets

- A. Seller must implement, at the designated effectivity or incorporation point, Boeing initiated asset configuration levels/revisions including asset engineering design/definition, asset usage instructions, and asset inspection instructions.
- B. If Boeing-defined asset engineering design/definition is not available at Seller or their subcontractors the Seller must formally coordinate with Boeing (ref. section 1.4 Seller Communication) to obtain instructions for resolution.
- C. For Boeing provided assets Seller must, regardless of capability level, take action upon notification of a configuration revision, to ensure configuration level revision incorporation at the designated effectivity or incorporation point with no impact to Boeing production schedules unless otherwise coordinated with Boeing (ref. section 1.4 Seller Communication).

#### 3.2.2 Seller-defined Assets

- A. Seller must ensure configuration levels/revisions are integrated into the asset family to support the designated effectivity or incorporation point.
- B. Seller Fabricated, Reworked, and Modified Assets Seller must, based on capability level, initiate actions to incorporate appropriate configuration levels/revisions into asset at the appropriate effectivity or incorporation point. Seller must initiate coordination and negotiation with Boeing (ref. section 1.4 Seller Communication) for proper configuration alignment.

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### 3.3 Seller Asset Periodic Inspections and Asset Acceptance

- A. Seller must ensure the correct configuration of all assets, including multi-configuration assets, used in conjunction with any production equipment being used during the manufacture of Boeing products.
- B. When configuration alignment issues arise during asset periodic inspection and asset acceptance, Seller must immediately and formally submit technical request (ref. section 1.4 Seller Communication) for resolution.
- C. Seller must verify asset configuration meets Purchase Contract and/or product engineering requirements prior to use. Asset configuration verification may include performing asset acceptance per section 8 (Acceptance).
- D. If Seller is unable to verify asset configuration, perform asset validation and/or asset periodic inspection the Seller must immediately and formally submit technical request (ref. section 1.4 Seller Communication) for instructions when:
  - 1. Asset design/definition is not available. (i.e., master tooling, digital definition, or asset engineering drawings or definition).
  - 2. Provided asset design/definition engineering conflicts with current product engineering (configuration alignment, dimensional issues, etc.)
  - 3. Where physical or digitally defined Category I (CAT I) master tool configuration issues are identified, Seller must immediately notify Boeing (ref. section 1.4 Seller Communication) for resolution. Typical instructions may include but are not limited to the following:
    - a. Formal Purchase Contract exception for asset configuration responsibility (i.e., purchase contracts letter, engineering change notice, statement of work).
    - b. Specification Outside Processing (SPECO) instructions for asset controls including asset configuration.
    - c. Purchase Contract change or special provision that provides asset configuration instructions as part of Purchase Contract language.
- E. When Seller identifies any Boeing provided Asset or any formal document where Asset configuration is suspect, the Seller must initiate a nonconformance and identify, document, and segregate any asset from manufacturing use until receipt of formal resolution or alternative method is authorized in accordance with this document. When correction of nonconformance exceeds Seller capability (Ref section 2 Seller Capability), Seller must formally contact Boeing (ref. section 1.4 Seller Communication) for resolution.

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## 4.0 Asset Design/Definition

### 4.1 Scope

This section defines requirements associated with asset design/definition engineering processes and provides quality requirements for the creation of initial and revised asset engineering design/definitions including all media forms, such as, but not limited to: text files, 2D drawings, 3D models, datasets, mylar type layouts, and numerically controlled (NC) programs.

### 4.2 Requirements

- A. Seller must demonstrate asset design/definition system capability and proficiency (i.e., personnel, system capabilities, capacity). Seller must be deemed capable for asset design/definition when required to support Boeing Purchase Contracts (Ref. section 1.2 General Requirements), Seller must maintain compliance and approval to sanctioned International Aerospace Quality Group (IAQG) AS/EN/JISQ 9100 Quality Management System (QMS) standards for Design and Development of Products and Services.
- B. Sellers must maintain documented information to develop, control, revise, and/or maintain asset designs/definition for all Boeing accountable assets, government and seller assets accountable to Boeing. This includes any Boeing provided asset design/definition controlling configuration of seller owned assets.
- C. Seller's documented information for asset design/definition must:
  1. Maintain design/definition configuration, including changes, must conform and be traceable to contracted product engineering.
  2. Define asset intent such as Category I (CAT I) master tool use, product testing, product verification regardless of asset category and where configuration critical asset is identified by program or Purchase Contract.
  3. Define and maintain asset usage instructions and will be traceable to the asset design/definition, is under revision control, and is required when any asset:
    - a. Is complex
    - b. Has critical indexing methods
    - c. Has multiple configuration settings
    - d. Usage cannot be easily communicated on the asset or within the manufacturing work instructions (i.e., shop traveler, work order)
    - e. Is critical for safe asset operation and usage
- D. Sellers using digital product definition data for any phase of asset design/definition, must meet the requirements of D6-51991 (Quality Assurance Standard for Digital Product Definition at Boeing Sellers).
- E. Asset engineering design/definition is generated when:
  1. The asset produces, supports or verifies an end item.
  2. The asset controls configuration critical product or assemblies.
  3. The asset interfaces or controls other Boeing accountable assets.
  4. The assets product interfaces with other assets at Boeing.
  5. Technical or program requirements for interface, fit-up, or structural integrity warrant it, regardless of the above.

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### 4.3 Design/Definition Approval

- A. Seller must obtain Design/Definition approval per Purchase Contract and/or Supplier Statement Of Work for Special Tooling and Special Test Equipment - BDS, BR&T, BT&E, BGS (Government Programs) (Ref. D33207-1) for any initial asset engineering design/definition and/or revisions when:
  - 1. Any Seller-defined design/definition for configuration critical assets controlling Boeing accountable assets or product.
  - 2. Seller owned asset is controlled by means of Purchase Contract provided Boeing-defined asset engineering design/definition.
- B. All initial asset designs/definition and revisions for assets used as Media of Inspection (MOI) including any asset Inspection Media of product, used in conjunction with production equipment and are considered “configuration critical” assets requires design/definition approvals.
- C. Any design/definition revisions of any asset used as Media of Inspection, Assets Inspection Media of products, any asset used to control other assets or any asset used in conjunction with production equipment affecting an assets fit, form or function require approval. Typically includes Category I (CAT I), Category II and any asset deemed configuration critical.
- D. When required by Purchase Contract (Ref. section 1.2 General Requirements), Boeing accountable assets require design/definition approvals for all “configuration critical” assets used as Media of Inspection, Assets Inspection Media of products, any asset used to control other assets or any asset used in conjunction with production equipment.
- E. The design/definition approvals must meet gated review process as outlined in Gated Tool Design Record (X35200-2) or Seller equivalent gated process and submitted to Boeing (ref. section 1.4 Seller Communication) using data system (i.e., Supplier Data Requirements List (SDRL), Customer/Supplier Data Transmittal (CSDT), and Integrated Data Management System (IDMS) or the authorized secured transmittal platform (e.g. Message Courier) per contractual instructions for approval.
- F. The design/definition review process is considered complete when all aspects and requirements of the asset design reviews are completed and signed off by all Boeing stakeholders. This includes but is not limited to: Initial Concept Concurrence, Functional Design Concurrence; Detail Tool Design Concurrence, Fabrication Ready Design Approval; Tool Engineering Complete.
- G. Seller must maintain Gated Tool Design Record (X35200-2) or Seller equivalent gated process documents as evidence of Boeing Design/Definition approval.
- H. Assets designs/definition not subject to Boeing approvals or gated reviews include all other assets not defined above. Boeing reserves the right to determine if asset design/definition approval is warranted during Purchase Contract execution regardless of asset type.



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## 4.4 Design/Definition Requirements

- A. All assets design/definition development requires a process plan/order/shop traveler (work authorization) for all initial asset engineering designs/definitions and any revisions. Work authorization may be provided by Boeing or Seller.
- B. All asset design or definition must meet the requirements as defined in a Boeing approved Purchase Contract (Ref. section 1.2 General Requirements).
  - 1. Seller developed asset designs/definition must be traceable to the product engineering or specification criteria it was developed from.
- C. All asset designs must be in English and the imperial measurement system. Designs that are developed or maintained in foreign locations may include their native language and measuring system to aide in the fabrication process.
- D. All asset designs/definitions must meet D33011 series (Tooling Design Standards) and American Society of Mechanical Engineers (ASME) Y14.100 requirements or a Seller's equivalent design standards. All asset engineering design/definition must meet requirements per American Society of Mechanical Engineers (ASME) Y14.5 - Dimensioning and Tolerancing, including Geometric Dimensioning and Tolerancing (GD&T).
  - 1. Determination of a Seller's asset design/definition standards' equivalence and capability will be at the discretion of Boeing (Ref. section 4.2 B).
- E. When defined in Purchase Contract (Ref section 1.2 General Requirements) that asset stress analysis is required by Boeing. All asset designs/definitions must bear evidence of a formal stress analysis completion, traceability, and acceptance (Ref. D33011-23).
- F. When required by Purchase Contract (Ref section 1.2 General Requirements) where asset definition (i.e. non-designed) is generated to define configuration and fabrication of an asset, this definition is subject to all requirements listed above. Boeing reserves the right for final determination of asset definition development, approval and release. Typical data elements used or developed for asset definition include, but are not limited to the following:
  - 1. Released and configured product engineering (i.e. 3D Models, 2D drawings).
  - 2. 3D datasets (i.e. Supplier part files, Step files) including any dataset variation used.
  - 3. 2D data (i.e. mylar type layouts, flat pattern data) including any variation used.

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## **5.0 Data Elements**

### **5.1 Scope**

This section applies to all Boeing and Government-owned assets. Data package elements enable Boeing and Seller to identify, define, use, and periodically inspect assets at Seller facilities.

### **5.2 Requirements**

A. The following are data element requirements for asset identification, engineering design/definition (e.g., drawings, models, digital data, etc.), usage instructions, and inspection instructions. Based on any data element changes to an asset, Seller must take any action necessary as defined by this document to control and/or incorporate any contractual changes.

### **5.3 Asset Specification/Engineering Design/Definition Requirements**

A. Seller must integrate and incorporate any asset specification and/or engineering design/definition (Boeing or Seller-defined), original and revised data elements, this includes any asset used as Media of Inspection, Assets Inspection Media of products, any asset used to control other assets or any asset used in conjunction with production equipment.

### **5.4 Asset Identification**

- A. Asset identification must meet Purchase Contract (Ref. section 1.2 General Requirements).
- B. Unless otherwise specified by Purchase Contract the asset identification and changes must meet the requirements as defined in:
  - 1. Tooling Assets - D33181-40 (Tool Identification); D33041 series (Tool Identification Codes)
  - 2. Special Test and Production Equipment – D33042-1(Boeing Special Test Equipment, Agency Peculiar Property, and Plant Equipment Identification),
- C. Upon asset acceptance for production use or delivery, asset identification must not be changed without notification and concurrence (ref. section 1.4 Seller Communication).

### **5.5 Asset Usage Instructions**

- A. Asset usage instructions include technical and process related information for asset users. They are typically provided when asset is highly complex, have critical indexing methods, have multiple configuration settings, or when asset usage cannot be easily communicated on the asset or within the manufacturing work instructions. Asset usage instructions may include Original Equipment Manufacturers (OEM) operation manuals typically provided for Equipment or Special Test Equipment (STE).
  - 1. Boeing-defined and provided
    - a. Seller must use and flow Boeing-provided asset usage instructions including revisions to the asset users through Seller's work authorization methods. Seller must ensure and verify users are working to latest asset usage instruction per active Purchase Contract.

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- b. Seller requested asset usage instruction changes must be submitted (ref. section 1.4 Seller Communication) for technical review and approval prior to incorporation.
- 2. Seller-defined
    - a. Seller determination for asset usage instructions must meet the requirements per section 4.2C3 (Asset Design/Definition). Asset usage instructions including revisions must be flowed to the asset users through Seller's work authorization methods.
    - b. Seller must maintain a record of all Seller-defined asset usage instructions, including revisions and must make them available to Boeing upon request.

## **5.6 Periodic Inspection Plans**

- A. Seller must integrate and incorporate Boeing provided Periodic Inspection Plans (PIP). Boeing provided Periodic Inspection Plans (PIP) must be controlled, maintained and used per section 9.2 (Periodic Inspection) of this document.

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## 6.0 Fabrication, Rework, and Modification

### 6.1 Scope

This section defines Seller requirements for asset initial fabrication, rework, and modification.

### 6.2 Requirements

- A. Seller must be deemed capable by Boeing prior to performing any asset initial fabrication, rework, and modification. Capability determination will be accomplished per section 2.0 (Seller Asset Capabilities).
- B. Seller must maintain the following:
  - 1. Documented information for asset fabrication, rework, and modification. This includes any Seller capabilities used to realize, conform, configure, or accept an asset.
  - 2. Calibrated/Certified equipment, including Coordinate Measurement Systems (CMS).
  - 3. A trained/skilled workforce and maintain training records that include:
    - a. Process training.
    - b. Certified operator/processes (i.e., welding, nondestructive testing).
    - c. Equipment usage and proficiency (e.g., 3D applications, Coordinate Measurement systems (CMS), etc.).
- C. All assets require a work authorization (e.g., process plan, work order, tool order, shop travelers, etc.) for any asset initial fabrication, rework, and modification activities. Initial fabrication, rework, or modification work authorization will be provided by Boeing or Seller. Seller's work authorization must be:
  - 1. Traceable to Boeing Purchase Contract.
  - 2. Traceable to asset Design/Definition and/or product engineering.
  - 3. Traceable to asset fabrication specifications.
- D. All asset initial fabrication, rework and modification documents must include build log and/or inspection records (Ref. section 8.2 Acceptance).
  - 1. When program specific forms are required per Purchase Contract, Seller must contact Boeing (ref. section 1.4 Seller Communication) to obtain clarification, instructions and any contractual forms.
  - 2. Where program specific documented information is requested (e.g. MAC1147 series forms, AS9102 forms, certifications, electronic reports), Seller may develop and use equivalent documented information in lieu of Boeing forms.
- E. All assets must satisfy identification requirements as defined in section 5.4 (Asset Identification).
- F. All initial fabrication, rework and modification records (i.e., work authorization, inspection records, build log documents, electronic records format), will be maintained per Seller Quality Management System (QMS) and Section 19.0 (Records).

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### **6.3 Initial Fabrication, Rework and Modification**

- A. All assets must be initial fabricated, reworked, or modified as defined per Purchase Contract (Ref. section 1.2 General Requirements) including design/definition and/or specifications.
- B. Where asset standards or specifications are defined (i.e., General notes, parts lists, data elements, dataset, contract letter/memo, etc.) and are not available Seller must immediately submit formal request (ref. section 1.4 Seller Communication) for instructions and resolution.
- C. Assets being initially fabricated, reworked, or modified using Product Definition Template type layouts (e.g., electronically produced drawings, engineering wash offs, master layouts, computer aided master layout, photo contact master) as asset definition, all mylar type layouts must be maintained per D950-11288-1 (Product Definition Template (PDT) Requirements, Validation and Verification Processes, and Handling Instructions for Plot Centers and Seller Use).
- D. Any asset discrepancies identified that cannot be corrected during initial fabrication, rework, or modification must be formally documented. Seller must document discrepancies per section 15 (Nonconformance) and addressed in accordance with Seller's Quality Management System (QMS) process, including Boeing notification.

### **6.4 Asset Material**

- A. No Material substitutions are allowed, including commercial off the shelf (COTS) materials without prior, formal Boeing technical authorization. This includes any asset initial fabrication, rework, and modification process where safety of personnel, equipment and product can occur. Typical authorization includes but is not limited to:
  - 1. Seller submitted nonconformance (Ref. section 15 Nonconformance).
  - 2. Boeing Material Substitution Drawing/Specification/List (i.e., D33181-105 Tool Fabrication and/or Rework without Drawing Coverage).

### **6.5 Coordinate Measuring Systems (CMS) Measurement**

- A. Sellers using Coordinate Measuring Systems (CMS) for asset initial fabrication, rework, and modification, must document and control their processes in accordance with D6-51991(Quality Assurance Standard for Digital Product Definition at Boeing Suppliers).
  - 1. When using Coordinate Measuring Systems (CMS), measurements must be performed within American Society of Mechanical Engineers (ASME) Y14.5 paragraph 1.4 Fundamental Rules (1), unless otherwise specified. All measured dimensions are applicable at 20°C (68°F). When environmental conditions prevent control, material property Coefficient of Thermal Expansion (CTE) must be used unless otherwise specified in asset design/definition. Seller must contact (ref. section 1.4 Seller Communication) for Boeing technical approval of any deviation.
- B. Where Seller's maintain a calibrated manual Coordinate Measuring Machine (CMM) without model based measurement capability, Control of Measurement Equipment compliance to D6-51991 (Quality Assurance Standard for Digital Product Definition at Boeing Suppliers) is not mandatory.

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Seller's using manual Coordinate Measurement Machines (CMM) for asset measurement must maintain equipment certifications and user level documented information, including results reporting and acceptance.

## **6.6 Master Coordination**

- A. As defined in Boeing Purchase Contract (Ref. section 1.2 General Requirements) use of Category I (CAT I) master tools is mandatory. Where physical or digital Category I (CAT I) master tools control asset features (interface, interchangeability, etc.) is required, the Category I (CAT I) master tool is the control authority regardless of design/definition values.
- B. Usage and coordination criteria of Category I (CAT I) master tools as defined on design/definition (general notes, fabrication specifications, etc.) must be followed during initial fabrication, rework, modification, inspection or periodic inspection of an asset.
- C. Category I (CAT I) master tool coordination must be performed as defined per asset design/ definition, including any control specification. Optimal coordination must meet American Society of Mechanical Engineers (ASME) Y14.5 paragraph 1.4 Fundamental Rules (I), unless otherwise specified and per section 6.5 A1 (Coordinate Measuring Systems (CMS) measurements).
- D. The Seller must ensure all Category I (CAT I) master tools are independently coordinated to any asset where dimensional coordination integrity must be maintained. Category I (CAT I) master tools must not be supported by any asset features, framing or structures where clamping or weight forces will influence coordination unless specifically defined in asset design/definition (general notes, fabrication specification, etc.). Where physical Category I (CAT I) master tools are coordinated to production tooling, the work must be accomplished with proper attention to the temperature. Nominal temperature range should be within 63 to 78 degrees F.
- E. Unless otherwise contractually authorized the Seller must ensure Category I (CAT I) master tool coordination is performed as a single event that verifies and documents all critical features requiring coordination.
- F. Seller will not use Category I (CAT I) master tool for direct manufacture of production parts. Strict adherence to this requirement is mandatory.
- G. The Seller must not rework or modify any Category I (CAT I) master tool during possession or use. Any issues identified by Seller involving a Category I (CAT I) master tool (i.e., configuration alignment, dimensional error, damage, usage instructions,) must be formally documented per section 15 (Nonconformance) communicated to Boeing (ref. section 1.4 Seller Communication) and/or documented per contractual requirements and Seller's Quality Management System (QMS).
- H. The Seller must not use digital transfer of Category I (CAT I) master tool coordination features where a physical master is required. Seller must not deviate from Category I (CAT I) master tooling coordination as defined in design/definition requirements. Any digital master process must satisfy section 6.6 I & J.

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- I. Sellers may request digital mapping/measurement of Category I (CAT I) master tools. Seller must formally request technical authorization (Ref. X30613 or Seller equivalent form) to digitally map/measure a Category I (CAT I) master tool and obtain technical and contractual approval to proceed (ref. section 1.4 Seller Communication).
  - J. Boeing contractually provided or as identified on asset design/definition, approved replacement of physical Category I (CAT I) master tools with digital configuration control datasets (digital masters) may be used for initial fabrication, rework, modification, acceptance, and periodic inspection of an asset.

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## 7.0 Special Processes

### 7.1 Scope

This section defines the special processes used during asset initial fabrication, rework and modification involving materials modification, test / inspection in accordance with established engineering specifications, drawings and quality requirements.

### 7.2 Requirements

- A. Sellers maintaining special process capabilities (i.e., material processing, heat treating, plating, stress relief, welding) in support of asset fabrication must:
  - 1. Maintain documented information to support special process capabilities.
  - 2. Maintain facilities, certified and/or qualified equipment, and trained work force in support of special process.
  - 3. Use certified inspection personnel to the applicable American Society for Nondestructive Testing (ASNT) Level or equivalent international industry standard when required by Purchase Contract, specification and/or engineering design/definition.
  - 4. Maintain special process personnel training and certifications per established Quality Management System (QMS) requirements.
- B. Where Seller maintains Nadcap (National Aerospace and Defense Contractors Accreditation Program) or accredited Certified Body special process approvals, such approvals are recognized as special process capability controls.
- C. Sellers performing asset welding must meet requirements as defined in the asset definition and/or fabrication standard during asset initial fabrication, rework, or modification and satisfy all welding requirements per D32028 series.
- D. All welders performing asset welding must meet and demonstrate proficiency by qualifying to a recognized welding code or specification per D32028-1 (General Requirements for Tooling Welding).
- E. During asset welding processes, all inspection level 1, 2A and 2B welds must satisfy requirements per D32028-1 (General Requirements for Tooling Welding) and/or AWS CWI/QC1 (American Weld Society Certified Weld Inspector) or an equivalent international industry standard.
- F. Special Process results must be documented and/or accepted on applicable work authorization or certification report for processes performed as defined per Quality Management System (QMS) and section 19.0 (Records).



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## 8.0 Acceptance

### 8.1 Scope

This section defines asset acceptance requirements for Seller and their subcontractors for initial fabrication, receiving, relocation, rework, and modification of Boeing accountable assets.

### 8.2 Requirements

- A. Seller must demonstrate asset acceptance process capability and proficiency (i.e., personnel, system capabilities, capacity). Seller must be deemed capable (Ref. section 2.0 Seller Asset Capability) for asset inspection, verification, validation when required to support Boeing Purchase Contracts (Ref. section 1.2 General Requirements).
- B. Sellers must be deemed capable for use of Coordinate Measurement Systems (CMS) for any asset acceptance processes and must be approved to D6-51991 (Quality Assurance Standard for Digital Product Definition at Boeing Sellers).
  - 1. Best Fit alignments must not be used for asset acceptance unless contractually authorized by purchase contract and/or Asset Design/Definition. Evidence of authorization must accompany inspection reports (Ref. section 19 Records Requirements). Seller must contact Boeing (ref. section 1.4 Seller Communication) to obtain authorization and technical instructions when Best Fit alignment is needed or requested.
- C. Sellers must be deemed capable for use of manual Coordinate Measurement Machines (CMM) for asset acceptance processes as defined per Seller's Quality Management System (QMS). Including equipment certifications, user level documented information, results reporting and acceptance.
- D. It is the Seller's responsibility to ensure asset meets Boeing Purchase Contract, design/definition, and any specifications to satisfy compliance and configuration alignment.
- E. All assets initial fabrication, rework and modification by Seller must be 100% inspected. All acceptance results must bear evidence of acceptance by qualified personnel. This includes any Seller generated inspection media (i.e., graphic, sketches, mylar type layouts) being used to accept an asset including any asset features, details or assemblies.
- F. All assets require a fabrication inspection record or build log (Ref. section 6.2 Fabrication, Rework, and Modification). Records will indicate fabrication and/or inspection status of both in-process (progressive) and final inspection and acceptance of an asset. Seller is responsible for using any requested inspection record or build log forms or electronic acceptance records format (Ref. section 19.0 Records) or equivalent Seller forms for all initial fabrication, rework, or modification acceptance. When program specific forms are required per Purchase Contracts, Seller must contact Boeing (ref. section 1.4 Seller Communication) to obtain clarification, instructions and any contractual forms.
- G. Before final acceptance of an asset, the Seller must:
  - 1. Review the asset inspection records (i.e., inspection record, build log, work authorization), for completeness and accuracy, making sure all

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required dimensions and build specifications are recorded, accepted by qualified personnel, and dated.

2. Verify that asset and all loose and removable parts are identified.
  3. Ensure that all asset critical tolerances of +/- 0.015" or less are documented on build and/or inspection records as defined on asset design/definition.
  4. Ensure all Geometric Dimensioning and Tolerancing (GD&T) features, regardless of tolerance, are documented on inspection records or build logs as defined on asset design/definition. (Ref. American Society of Mechanical Engineers (ASME) Y14.5).
  5. Ensure all fabrication special processes (e.g., material, heat treat, plating, welding etc.) and general notes are documented including any industry certifications as applicable.
- H. All asset inspection records or build logs must be retained and made available upon request or provided as required per Purchase Contract requirement as defined in section 19.0 (Records). Seller must formally notify Boeing (ref. section 1.4 Seller Communication) for all issues involving development, submittal and retention of asset acceptance records.
- I. Boeing reserves the right to verify asset setup and asset acceptance including Category I (CAT I) master coordination per section 6.6 (Master Coordination). When Boeing verification of asset is identified to support Boeing Purchase Contracts (Ref. section 1.2 General Requirements), Seller must contact Boeing (ref. section 1.4 Seller Communication) to coordinate Boeing attendance.
- J. When Boeing asset acceptance is required by Boeing Purchase Contract (Ref. section 1.2 General Requirements), Seller must notify Boeing (ref. section 1.4 Seller Communication) or process request within Boeing's Quality data system when Seller is ready for Boeing asset acceptance. Seller must only complete asset acceptance requirement per section 8.2 G prior to requesting Boeing asset acceptance support. Seller must be directly available to assist Boeing during asset acceptance when required.
- K. Seller must apply visible acceptance evidence of an asset by one of the following methods:
1. Physically on ST by permanent means such as impression stamping, chemical or mechanical etch, laser or machine engraving, etc.
  2. A documented alternate method containing the following characteristics when asset size, usage and environment does not permit physical evidence marking (e.g., identification tags, unique identifier – color, marking, etc.). Ref section 5.6 Asset Identification.
  3. As defined per Boeing contractual instructions or as defined per Seller's Quality Management System.

### **8.3 Asset Acceptance Methods**

- A. Seller must apply one of the following asset acceptance types:
1. Minor Verification: The most common process. Typically occurs when manufacturing uses a new, reworked or modified asset for the first time as defined in manufacturing work instructions (shop traveler, etc.). During first production run manufacturing work instructions must clearly define

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independent product verification method and sequence to determine asset acceptance status.

Typically applied to low-risk assets of basic to moderate complexity and may or may not control product configuration. The asset is unconditionally released for production use upon completion of tool fabrication and acceptance. The initial result of product from the asset is independently verified to validate the asset produces compliant product or test per engineering requirements and/or specifications. Successful completion of asset minor verification allows asset acceptance per section 8 (Acceptance). Should asset users encounter issues or nonconforming conditions, the Seller's documented asset support process applies.

2. Major Verification – Product Fabrication: Process applied to assets that are defined and/or fabricated with intentional compensation from product nominal engineering definition to accommodate manufacturing usage or material processing phenomena such as spring back or thermal behaviors. The asset is typically fabricated to design/definition requirements, accepted, and conditionally released for manufacturing use. During first production run manufacturing work instructions must clearly define independent product verification method and sequence to determine asset acceptance status. The initial product of the asset is independently verified to validate the asset produces compliant product or test per engineering requirements and/or specifications. Successful completion of asset Major Verification – Product Fabrication allows asset acceptance per section 8 (Acceptance). Once accepted the asset is unconditionally released for production use.
  3. Major Verification - Assembly: Process typically applied to complex assets, including end item assets used as Media of Inspection (MOI) and any asset Inspection Media of product. Typically consists of streamlined forms for collecting issues identified during initial use and inspections. As a rule assets are initially fabricated, reworked and modified to design/definition requirements, including Category I (CAT I) Master Coordination and accepted per asset work authorization documents. Asset is conditionally released for manufacturing and assembly use (e.g., proof for production). Verification schedule may include more than one usage to verify stability and dimensional integrity when an asset produces, verifies, or tests a part or assembly to product engineering requirements. Asset periodic inspections per section 9 (Periodic Inspection) may be conducted after production assemblies are produced to demonstrate asset stability and dimensional integrity (typically applied to very large assembly jigs, check fixtures and test stands that may experience foundation settling, base and end-gate settling, etc.). Successful completion of asset Major Verification - Assembly allows asset acceptance per section 8 (Acceptance). Once accepted the asset is unconditionally released for production use.
- B. Boeing reserves the right to determine the asset acceptance method. Should Seller have questions regarding selecting the appropriate asset acceptance method, formally contact Boeing (ref. section 1.4 Seller Communication) to obtain technical instructions for resolution.

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- C. During asset acceptance, asset must be inspected in an unrestrained condition “free state” regardless of acceptance method, system or equipment used unless otherwise specified in design/definition or specification.
    - 1. When defined asset acceptance in restrained condition is determined, acceptance typically as a result of assets intended usage and may include:
      - a. Where the asset is used in restrained condition (e.g., mill fixtures).
      - b. Where asset is restrained (clamped in place) to production hardware or structure during usage (e.g., trim templates, drill plates).
    - 2. Unrestrained asset acceptance typically includes:
      - a. Standalone assets where product is installed or attached for use, acceptance or test (e.g., check fixtures, assembly jigs, test stands).
      - b. Asset plumb and leveling to meet design, specification and reference system requirements is not considered restrained (e.g., eliminate rack/sag/twist conditions).
      - c. Category I (CAT I) master tools are rigged/indexed/coordinated in an independent unrestrained condition during any fabrication or acceptance process per section 6.6 (Master Coordination).

#### **8.4 Proof Load Test**

- A. When required by Boeing Purchase Contract (Ref. section 1.2 General Requirements), that Proof Load Test must be completed, documented, and accepted by the Seller or Seller’s approved subcontractor per section 1.3 (Subcontractor General Requirements).
- B. Boeing reserves the right to witness the proof load test. When required Seller must notify Boeing (ref. section 1.4 Seller Communication) or process request within Boeing’s Quality data system when Seller is ready for Boeing witness of proof load test activities.
- C. All proof load test activities must meet requirements as identified in asset design/definition (e.g., sheets, diagrams, cases, graphics, etc.) and any proof load test specifications per Purchase Contract or design/definition general notes.
- D. Seller must use certified equipment/devices (load cells, scales, weights, torque wrench, etc.) when performing proof load testing.
- E. Seller must affix or provide any required proof load test labels or tags when required by Purchase Contract, design/definition or specification.
- F. When Seller is contractually delegated proof load test activity, Seller must perform proof load test per design/definition and document results per section 8.2 D and E (Acceptance).
- G. The Seller must develop a separate proof load test certificate for each asset requiring proof load testing. Each Proof load test certification must be traceable to Purchase Contract, asset, asset design/definition, and asset configuration. Proof load test results and certification must be processed per section 19 (Records).
- H. Seller must contact Boeing (ref. section 1.4 Seller Communication) for technical instructions when proof load test requirements are not defined, such as but not limited to, Boeing witness, proof load test duration, rigging, rated loads, objective evidence, reports, results submittal, etc.

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## 9.0 Periodic Inspection

### 9.1 Scope

This section defines the requirements for assets that require periodic inspection. Any asset being used as control media or the only means to accept, test and determine asset configuration is subject to periodic inspections. Typically assets subject to periodic inspection supports end item assets, including Major End-Item assembly assets for conformance and configuration to contracted engineering design/definition.

### 9.2 Requirements

- A. Seller must demonstrate Periodic Inspection process and system capability and proficiency (i.e., personnel, system capabilities, capacity). Seller must be deemed capable (Ref. section 2.0 Seller Asset Capability) for asset Periodic Inspection when required to support Boeing Purchase Contracts.
- B. When required by Boeing Purchase Contract (Ref. section 1.2 General Requirements), asset design/definition or any asset used as control media or for product acceptance, including Boeing identified Major End-Item assembly assets are subject to Periodic Inspections. All Periodic Inspection actions will be accomplished as defined below.
- C. Any asset being used as control media in verifying product features or characteristics of parts or assemblies requires periodic inspections in addition to each use condition checks (ref section 10 – Each Use Condition Check). This includes any asset deemed Media of Inspection (MOI) or Inspection Media of product by Seller or Boeing. Asset types subject to Periodic Inspection include but are not limited to the following:
  - 1. Special Tooling (ST) – Category II (CAT II)
  - 2. Major End-Item Assembly Special Tooling (ST) – Category II (CAT II)
  - 3. Special Test Equipment (STE)
  - 4. Any asset deemed configuration critical by Boeing
  - 5. Production Equipment
- D. There are two specifically defined types of asset periodic inspections. Type 1 (Major) and Type 2 (Minor) for Media of Inspection (MOI) and Inspection Media of Product assets.
  - 1. Type 1 (Major) – Periodic Inspection Requirement: Physical dimensional measurement and/or coordination to a Category I (CAT I) master tool (physical or digital) including visual inspection that must be documented on a prescribed Periodic Inspection Plan (PIP) at a periodic interval or frequency.
  - 2. Type 2 (Minor) – Periodic Inspection Requirement: Visual inspection that must be controlled by documented information or on a prescribed Periodic Inspection Plan (PIP) at a periodic interval or frequency.
- E. Seller must maintain a listing (e.g., metrology recall system, gage control application, spread sheet, etc.) of all assets being used as Media of Inspection (MOI) or Inspection Media of product by Seller, including any asset provided to a subcontractor. These assets being used to accept Boeing or Government products must include the following:

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1. Boeing and Government accountable assets supplied by Boeing.
  2. Boeing and Government accountable assets provided by a Seller.
  3. Seller accountable assets controlled by Boeing provided Design/Definition.
  4. Any assets deemed configuration critical by Boeing.
- E. When Seller has demonstrated capability to Boeing to perform periodic inspections, the following requirements must apply:
1. Seller may determine asset for use as Media of Inspection (MOI) or Inspection Media of product by Seller owned and Boeing accountable asset (i.e., category III special tools). Seller's process for asset product acceptance determination must meet the following conditions:
    - a. Seller retains/maintains asset engineering design/definition.
    - b. Seller retains Product engineering definition to determine independent product verification.
  2. For Seller's initial asset determination all assets must meet asset acceptance requirements per section 8.2 (Acceptance) or have evidence of acceptance (i.e., physical acceptance stamp, etc.).
  3. After initial asset product acceptance determination Periodic Inspection Type 1 or Type 2 with supporting Periodic Inspection Plan (PIP) must be implemented based upon product engineering and asset complexity.
  4. Seller determination of asset Production acceptance (i.e., category III) status must be controlled per section 9 (Periodic Inspection).
- F. Boeing reserves the right to initiate changes to any asset Periodic Inspection designation regardless of asset type or category. Seller-initiated changes to the asset periodic inspection designation or periodic inspection frequency or interval must be approved by Boeing (ref. section 1.4 Seller Communication) prior to implementation.
- G. At a minimum, Seller must conduct periodic inspections every 12 months for all assets in use until sufficient data is available to adjust the frequency of periodic inspection.
- H. Seller must review the interval of periodic inspections for adequacy and adjust intervals accordingly. Increasing or decreasing the interval must be accomplished using statistical methods and historical periodic inspection data.
- I. If Seller is unable to perform Periodic Inspection at designated frequency due to production constraints or spares requirement, Seller must formally request Periodic Inspection extension from Boeing (ref. section 1.4 Seller Communication) prior to Periodic Inspection expiration. Sellers must provide extension justification and estimated Periodic Inspection performance/completion date.
- J. Any asset that exceeds Periodic Inspection frequency date, including customer rejection of asset Periodic Inspection extension, must be documented per section 15 (Nonconformance) and processed per Seller's Quality Manage System (QMS) process. Any asset as a result of delinquent Periodic Inspection may not be used for product acceptance until such time as the asset Periodic Inspection is completed and accepted. Alternate asset usage and verification methods may be required per section 15.2 H&I (Nonconforming Asset).

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- K. Seller must apply an easily recognizable indication (e.g., label, tag, etc.) to the asset that bears the expiration date, acceptance status, and inspection authority of the individual applying the indicator.
  - L. Seller must provide and maintain the results of preceding and current periodic inspection of assets. Periodic Inspection result must be controlled per section 19 (Records). The records must include at a minimum:
    - 1. Dimensions/features verified during the periodic inspection as defined in Periodic Inspection Plan (PIP), including actual values from coordination to Category I (CAT I) masters.
    - 2. The date of the periodic check.
    - 3. The inspection authority of the individual who performed the check.
    - 4. The date of the next scheduled periodic check (expiration date).
    - 5. Asset engineering design/definition used as inspection requirement.
    - 6. Verification of configuration level.
    - 7. Identification of the acceptance status of the asset.
    - 8. Traceability to Periodic Inspection Plan (PIP) and revision.
  - M. All assets supporting active procurement including out of production spares procurement must maintain current periodic recall status.
    - 1. Assets supporting recurring program procurement must maintain current periodic tool inspection recall regardless of asset status (i.e., stored, in-active)
    - 2. For assets supporting out of production (i.e., spares) procurement greater than one year, the periodic recall may be extended until such time as asset status changes due to additional procurement activity.
    - 3. Assets exceeding exception status of one year must be submitted as excess and processed per Purchase Contract close-out requirements.
    - 4. For assets (stored, in-active, etc.) under periodic inspection extension status, assets must satisfy completed Periodic Inspection (Type 1 or Type 2) prior to next usage.

### **9.3 Periodic Inspection Plans**

- A. Seller must create documented information to develop and maintain Periodic Inspection Plans (PIP). This process must:
  - 1. Be traceable to individual specific asset.
  - 2. Be traceable to design/definition.
  - 3. Contain asset specific inspection instructions, including visual inspection.
  - 4. Be maintained under configuration controls.
  - 5. Be approved and released.
- B. The Seller will create Periodic Inspection Plans (PIP) that are individual “asset specific” plans that supports asset assigned periodic inspection frequencies. Periodic Inspection Plans (PIP) are intended to provide inspection instructions to asset users required to maintain asset conformance and configuration. The use of approved text and graphics to enhance the Periodic Inspection Plan (PIP) content and usage is encouraged.
- C. Periodic Inspection instructions are typically developed and used for Special Tooling (ST) Category II (CAT II) Type 1 (Major) and Type 2 (Minor); Special Test Equipment (STE); and Equipment. Including Boeing identified Major End-Item Assembly Category II (CAT II) Type 1 (Major) assets.

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1. Seller-defined
    - a. Seller-defined asset Periodic Inspection Plans (PIP) for all Category II (Cat II) Type 1 (Major) periodic inspection instructions, including any Major End-Item Assembly assets must be submitted to Boeing for technical approval. This includes any Boeing-defined Periodic Inspection Plans (PIP) revised or changed by Seller.
    - b. Seller must submit Seller-defined Periodic Inspection Plans (PIP), including changes to Boeing (ref. section 1.4 Seller Communication) for technical approval.
    - c. Seller must maintain configuration alignment of all Periodic Inspection Plans (PIP) to design/definition.
  2. Boeing-defined
    - a. Seller requested changes to Boeing-defined Periodic Inspection Plans (PIP) must be submitted to Boeing for technical approval (i.e., configuration alignment, inspection instructions, or frequency).
    - b. For Boeing provided assets identified as Media of Inspection (MOI), Inspection Media, or Major End-Item Assembly asset of product where no Periodic Inspection Plan is provided Seller must notify Boeing (ref. section 1.4 Seller Communication) for technical instructions to receive or develop Periodic Inspection Plans (PIP).
- D. Periodic Inspection instructions must include:
1. Type 1 (Major) dimensional inspection - Design/Definition requirements to verify all asset features being used to control product compliance/acceptance including but not limited to: locators, indexes, surfaces, details, pins, bushings, reference systems, enhanced reference systems (ERS), datum's, adjustable datum's, tooling holes, gages, fittings, adaptors, etc. and Each Use Condition Check elements as defined per section 10 (Each Use Condition Checks). Instructions must include all critical tolerance ranges and Geometric Dimensioning and Tolerancing (GD&T) features.
    - a. Where Category I (CAT I) master tools (digital or physical) are asset authority and are required as part of Periodic Inspection instructions to verify an asset section 6.6 (Master Coordination) and section 8.3 (Inspection Method) apply.
  2. Type 2 (Minor) visual inspection – defined features and all elements per section 10 (Each Use Condition Check).
- E. The following must be included as part of Asset Periodic Inspection Plan:
1. Periodic Inspection Plan (PIP) traceability (name or number) and revision
  2. Code/Number of the asset.
  3. Serial Number (when applicable).
  4. Unit Number
  5. Detail and Part Accountable
  6. Foreign Object Damage (FOD) check
  7. Operation and Function
- F. At a minimum, Seller must initiate Periodic Inspection Plans (PIP) on approved Seller work authorization for any Type I (Major) Periodic Inspection. Seller must flow Periodic Inspection Plans (PIP) to users performing periodic inspection activity.



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G. Any discrepancies identified during asset Periodic Inspection must be properly documented per Seller's Quality Management System (QMS) as defined per section 15 (Nonconformance) including Boeing notification.

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## 10.0 Each Use Condition Check

### 10.1 Scope

This section applies to Sellers using accountable assets as defined in work authorization documents. Any accountable asset being used during manufacturing of Boeing products is subject to Each Use Condition Checks.

### 10.2 Requirements

- A. Sellers must maintain documented information to perform Each Use Condition Checks for all Boeing accountable assets, government and seller assets accountable to Boeing. This includes any Boeing provided asset data elements controlling configuration of seller owned assets.
- B. Seller Each Use Condition Check documented information must at a minimum address the following:
  - 1. User actions and communication instructions.
  - 2. Roles and responsibilities.
  - 3. Asset segregation and resolution process.
- C. The user (asset coordinators, operators, mechanics, fabricators, etc.) of an asset is required to perform, at a minimum, a visual validation of the asset before each usage. This includes any mechanical handling equipment used to move or lift product or an asset. Typical areas of consideration during Each Use Condition Check include, but are not limited to the following:
  - 1. Asset is properly identified and identification is legible as defined in Seller work authorization (shop traveler, work order, etc.)
  - 2. An asset has evidence of acceptance on or near asset identification.
  - 3. The asset configuration level is identified.
  - 4. Asset instructions, directions, and caution/safety tags are securely attached or available and legible when used.
  - 5. All asset details/parts are available and in good condition:
    - a. "L" pins, hand knobs, scribes, step pins, etc. are attached to asset and are functional.
    - b. Rubber cushions and protective pads are functional and secure.
    - c. Toggle clamps, straps, and other hold-down devices are functional.
    - d. There are no worn, loose, cracked, or missing bushings.
    - e. There is no evidence of mushroom, damaged edges, or surfaces on details part or assembly locating features.
    - f. There is no corrosion or contamination on any part/assembly locating features.
    - g. Asset construction is complete. No missing nuts, bolts, washers, dowel pins, etc. preventing assets intended use. Including clear unauthorized use of spacers, washers or shims.
  - 6. Drill indicators, index holes, and surface stamping are clear and legible.
  - 7. There is no obvious degradation of tamperproof measures.
  - 8. No expired dates on asset certification labels (Periodic Inspection, Calibration, Preventative Maintenance and Proof Load test labels). This includes any gages, read-outs, etc. with a certification label used as part of an asset.

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- D. All Users and/or asset coordinators must ensure assets function correctly and is properly maintained per section 13.0 (Preventive Maintenance).
  - E. Seller must maintain formal objective evidence of Each Use Condition Checks being performed prior to use. Objective evidence may include operator acceptance sequence within manufacturing planning, etc.
  - F. The asset must only be used for the specific purpose for which it was intended.
  - G. Any asset discrepancies found during Each Use Condition Check must be properly documented and addressed in accordance with Seller's Quality Management System (QMS) including asset maintenance process.

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## 11.0 Manufacturing Work Instructions

### 11.1 Scope

This section covers all categories of Boeing or Government assets accountable to Boeing involved with the manufacture of Boeing or Government products. It defines Seller requirements for Seller manufacturing work authorization documents that require the use of assets.

### 11.2 Requirements

- A. Seller must ensure any asset used for the manufacture of Boeing products is documented and/or identified on appropriate Seller's and its subcontractors' manufacturing work authorization documents (shop travelers, work orders, manufacturing plans, etc.).
- B. Where asset traceability is identified on work authorization documents, asset usage instructions may be included as part of operation sequence or coordination data where asset usage instructions can be easily communicated.
- C. When separate approved asset usage instructions exist, Seller must document and/or identify the asset usage instruction, in addition to listing the asset in the work authorization document and make them available to all asset users.
- D. Seller must ensure assets are used in accordance with Seller work authorization documents as required per Boeing contractual requirements.
- E. When compliance issues or Seller manufacturing methods and processes come into conflict with the asset engineering design/definition, Seller work authorization documents, asset usage instructions, or asset configuration alignment Ref. section 1.2 (General Requirements), Seller is required to follow its Quality Management System (QMS) for nonconformance reporting and coordinate with Boeing (ref. section 1.4 Seller Communication) to obtain technical instructions for resolution.

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## 12.0 Production Process Verification and Asset Relationship

### 12.1 Scope

This section covers Boeing accountable and Government owned assets as related to Production Process Verification as defined in AS9100, also referred to as First Article Inspection (FAI) as defined in AS9102. The Production Process Verification requirements are in effect even after initial asset acceptance.

### 12.2 Requirements

- A. All assets used during the performance of Production Process Verification activities must show evidence of acceptance status (Ref. section 8.2K Acceptance) prior to use, including assets used for product acceptance.
- B. The following asset-related events must require a partial or complete re-accomplishment of a Product Process Verification activity for the subject part or assembly when:
  - 1. Asset engineering Design/Definition changes potentially affecting fit, form or function occur, including asset coded Numerical Controlled (N/C) program changes of parts or assemblies.
  - 2. Manufacturing changes to asset configuration controlling or verifying features potentially affecting fit, form, or function of the product.
  - 3. Natural or man-made disaster (e.g., earthquake, flood, and tornado) where asset is potentially affected (Ref. section 13 Preventive Maintenance).
- C. Asset related events that do not invoke re-accomplishment of Product Process Verification include the following:
  - 1. Asset Preventive Maintenance per section 13 (e.g., cleaning, dressing index features, replacement of pins, etc.).
  - 2. Returning asset to previously accepted design/definition configuration.
  - 3. Asset design/definition revisions or modifications to asset features not affecting configuration of part or assembly (e.g., lightening holes, clearance issues, operator access issues, etc.).

### 12.3 Communication Requirements

- A. When Boeing initiates actions that require a partial or complete re-accomplishment of Product Process Validation due to asset-related events, Seller is required to communicate the requirement to any affected Seller's subcontractors.
- B. When Seller initiates actions that require a partial or complete re-accomplishment of Product Process Validation due to asset-related events, Seller must notify Boeing prior to implementation. Boeing determination/approval and coordination of appropriate Product Process Verification actions is required.

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## 13.0 Preventive Maintenance

### 13.1 Scope

This section covers the scope of asset user maintenance and preventive maintenance, which includes all Boeing-accountable and Government owned Boeing accountable assets in Seller's and its subcontractors' possession. Normal asset wear is expected during use, and user and preventive maintenance is expected.

### 13.2 Requirements

- A. Sellers must maintain documented information with clear roles and responsibilities to perform user maintenance and preventive maintenance, including development and control of Preventive Maintenance Plans (PMP), for all Boeing accountable assets, government and seller assets accountable to Boeing.
  - 1. User Maintenance – Typically performed prior to and during asset usage by the asset user.
  - 2. Preventive Maintenance – Typically performed by asset coordinators or maintenance personnel as defined by a Preventative Maintenance Plan (PMP) on a prescribed frequency or schedule.
- B. Where a prescribed Preventive Maintenance frequency or schedule is defined Seller must maintain an asset listing (e.g., recall system, gage control application, spread sheet, etc.) and retain evidence of Preventive Maintenance events, results and completion.
- C. Asset features may become damaged or lost during normal usage (e.g., pins, clips, clamps, pads, removable components, etc.). Seller is responsible to establish and maintain a process to minimize damage or loss, and take actions to repair, or replace damaged or lost asset features.
- D. Sellers and Seller's subcontractors are required to keep all assets in a serviceable condition.
- E. Seller must take appropriate actions per Quality Management System (QMS) to address assets with excessive wear, damage or no longer in a serviceable condition. This may include Boeing notifications, nonconformance reporting (ref section 15), work authorization (Ref. section 6).
- F. Unless otherwise specified in the Purchase Contract (Ref. section 1.2 General Requirements), Seller is only responsible for repair to assets resulting from wear, damage during usage, or inappropriate protection and storage. Any deviation or exceptions will be subject to negotiation between Boeing (ref. section 1.4 Seller Communication) and Seller.
- G. Any asset discrepancies found during preventive maintenance activity must be properly documented and addressed in accordance with Seller's Quality Management System (QMS).
- H. Seller must immediately and formally submit technical request to Boeing (ref. section 1.4 Seller Communication) for resolution when normal wear or nonconformance conditions exceed Seller capability for correction (ref section 2 Seller Asset Capability and section 1.3 Subcontractor General Requirements).

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- I. Seller must, in a timely manner, disclose and formally submit request to Boeing (ref. section 1.4 Seller Communication) for technical solution when asset approaches end of useful life cycle to ensure resolution is addressed before impact to the product quality or deliveries occur.
  - J. Any assets deemed Configuration Critical, Media of Inspection (MOI) or Inspection Media of product by Seller or Boeing that has been subjected to a natural or man-made incident such as:
    - 1. An earthquake of magnitude 5.0 or higher on the Richter scale (or equivalent) within a 50 mile radius.
    - 2. A natural disaster (hurricane/cyclone, flood, tornado, etc.).
    - 3. Man-made incident.

Where an incident may affect stability, integrity or conformity of an asset, regardless of category or type, at a minimum asset must be validated. Validation may include Each Use Condition Check (ref section 10), re-accomplishment of Periodic Inspection (Ref. section 9) or verification to design/definition requirements depending upon severity of the incident. Seller should contact Boeing (ref. section 1.4 Seller Communication) for guidance when necessary.

### **13.3 User Maintenance**

- A. The basic elements of asset user maintenance are Each Use Condition Checks (Ref. section 10) and Periodic Inspections (Ref. section 9).
- B. Seller must monitor asset features for excessive wear during use and take actions to address worn assets before the asset becomes nonconforming to asset design/definition requirements or produces a nonconforming product.
- C. At a minimum, Seller must place special emphasis on asset used in situations that may subject the asset to excessive wear or damage. These situations include but are not limited to:
  - 1. Exposure to cutting (e.g., routing, drilling, reaming) cycles.
  - 2. Exposure to force and load cycles.
  - 3. Exposure to vibration, striking, or impact cycles.
  - 4. Exposure to thermal cycles.
  - 5. Exposure to chemicals and fluids.
  - 6. Exposure to corrosive environment.
- D. Any maintenance issue identified by the user during asset use must be communicated and addressed by Seller's Quality Management System (QMS).

### **13.4 Preventive Maintenance**

- A. Assets subject to Preventive Maintenance must have a documented Preventive Maintenance Plan (PMP) and approved by Seller at a minimum. The Preventive Maintenance Plan may be Seller developed or provided by Boeing in support of Purchase Contracts.
- B. Preventive Maintenance Plan (PMP) must provide scheduled inspection, maintenance, and functionality test instructions as required to maintain the asset. These instructions are intended to minimize asset malfunction due to wear and neglect, and reduce risk of asset producing a nonconforming condition.

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- C. Typically required for any assets with special systems, load bearing equipment (static or overhead) or assets subjected to sustained usage. These assets typically include but are not limited to the following:
    - 1. Production Equipment – Automated machines and devices, including qualified Computer Numerical Control (CNC) machines.
    - 2. Handling Equipment – Below the Hook and transport devices used to move product or articles (Proof Load Test).
    - 3. Special Test Equipment (STE) – Includes special systems (pneumatic, hydraulic, electrical, and/or software)
    - 4. Equipment used in conjunction with Special Tooling (ST) – Automated machines (spar mills with mill fixtures, Rivet machines with holding fixtures, etc.).
  - D. Assets subject to Preventive Maintenance are required to have asset maintenance actions/instructions at a prescribed interval or frequency. Preventive Maintenance Plans (PMP) may include:
    - 1. Original Equipment Manufacturers (OEM) maintenance instructions.
    - 2. Asset design/definition maintenance requirements.
    - 3. Purchase Contract (Ref. section 1.2 General Requirements) maintenance instructions.
  - E. There are typically three levels of Planned Preventive Maintenance events performed by qualified personnel.
    - 1. A visual condition check of asset in using condition.
    - 2. A visual condition check, cleaning, lubricating, and adjusting of items such as nut, bolts, machine ways/lead screws, safety devises, handles, etc. and functionality checks such as wheels, casters, motors, lead screws, hoists, rails and bearings.
    - 3. Asset disassembly, visual inspection, functional testing, non-destructive inspection (NDI), or software testing/certification. This level of Preventative Maintenance normally requires work authorization (shop traveler or work order), and acceptance by Quality or qualified personnel.
  - F. Seller developed Preventive Maintenance Plans must include, at a minimum the following:
    - 1. Unique Preventive Maintenance Plan identification (number, etc.).
    - 2. Configuration control.
    - 3. Release status.
    - 4. Frequency/schedule as required.
    - 5. Asset maintenance instructions, including OEM manual if required.
    - 6. Maintenance instruction alignment to asset design/definition features.
  - G. Records of current and previous asset Preventive Maintenance events must be maintained per section 19 (Records).



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## 14.0 Protection and Storage

### 14.1 Scope

This requirement is applicable to all Boeing-accountable and Government owned Boeing accountable assets in Seller's and its subcontractors' possession. This requirement is applicable to all assets in use, not in use or stored.

### 14.2 Requirements

- A. All assets, regardless of category, must be protected to prevent loss, theft, damage, and deterioration while in the possession of Seller or Seller's subcontractor.
- B. Assets in Seller's possession must be protected from undue damage and deterioration including inappropriate exposure to the elements. When required, assets will have an appropriate preservative applied to prevent corrosion or oxidization.

### 14.3 Asset in Use

- A. Prior to each use, users must review the asset usage instructions and perform Each Use Condition Check (Ref. section 10) for serviceable condition. Any conditions hindering fit, form, function, or tool performance must be addressed through Seller's asset maintenance process (ref section 13.2) up to possible nonconformance documentation (Ref. section 15.2).
- B. Seller must review the asset documentation (design/definition, Original Equipment Manual (OEM), usage instructions, etc.) for serviceable condition and functionality. Any conditions hindering fit, form or function must be addressed through Seller's maintenance process, up to documenting a nonconformance. (Reference section 13 Preventive Maintenance)
- C. When assets are maintained (stored) in manufacturing areas to support recurring production, seller is required to protect asset to prevent corrosion or oxidization which may include application of an appropriate preservative.

### 14.4 Asset not in Use

- A. Asset not in use or stored by Seller must be controlled in a fashion and in facilities to prevent loss, theft, damage, and deterioration. Measures must be taken to apply an appropriate preservative and to protect assets from the elements. Seller's storage requirements must include periodic preservation / condition checks for all assets in storage.
- B. As a result of procurement completion or Purchase Contract termination involving an asset, such assets deemed out of production, stored or inactive must be properly documented within the supplier accountability process (Ref. E000 Supplier Requirements for Buyer/Government/Customer Property Management and D33113-1 Accountability of In-Plant/Out-Plant Special (Contract) Tools). Seller must, in a timely manner, formally notify Boeing (ref. section 1.4 Seller Communication per Purchase Contract closeout process and/or submit through online data system a request for asset disposition, regardless of asset type. (e.g., customer return, Buyer's request for seller storage, etc.)

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## 14.5 Storage and Protection Requirements

- A. This requirement is applicable to all Boeing owned and Government owned Boeing accountable assets in Seller's facilities, including interdivisions or subcontractors' possession. The Seller must utilize the storage requirements described below for the purpose of asset storage.
- B. Where Seller maintains a Government approved accountability system, Seller must follow Government property controls for storage of all Government owned assets provided in support of a Boeing Purchase Contract, including any additional storage requirements of this document where applicable.
- C. When required by Purchase Contract Seller must follow requirements of E000 (Supplier Requirements for Buyer/Government/Customer Property Management and D33113-1 (Accountability of In-Plant/Out-Plant Special (Contract) Tools) for any Boeing accountable asset and Government owned asset accountable to Boeing being stored by Seller.
- D. Asset storage and preservation will be negotiated between the seller and Boeing (ref. section 1.4 Seller Communication) per the affected Boeing division as defined by Purchase Contract.
- E. Assets deemed out of production, stored, inactive, or have reached the end of procurement or Purchase Contract termination, must be properly documented within the Seller accountability system.
- F. Seller must formally notify Boeing (ref. section 1.4 Seller Communication) for contractual instructions to disposition assets upon end of production or Purchase contract closeout (e.g., return, Boeing's request for Seller storage, etc.).
- G. Assets must be accounted for and stored in a manner to prevent loss, theft, damage, and deterioration. Seller must not expose Category I (CAT I) Master Tool or Master Tools containers to the outside environment.
- H. For all assets in storage Seller must perform periodic preservation / condition checks. Preservation checks at a minimum must include:
  - 1. Accountability – Identification and asset stored in documented location.
  - 2. Condition check - ensure an appropriate preservative is applied to prevent corrosion or oxidization.
  - 3. Resolve storage issues – restore or rehabilitate asset where corrosion, oxidization or environmental issues have occurred. (Ref. section 13.2 Preventive Maintenance).

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## 15.0 Nonconformance

### 15.1 Scope

This section covers all categories or types of Boeing accountable and Government owned assets accountable to Boeing involved with the manufacture of Boeing or Government products. It defines requirements for Seller's formal documentation process for improvement and implementation of any actions necessary to resolve nonconforming assets.

### 15.2 Requirements

- A. The Seller is required to maintain documented information that defines the roles and responsibilities, including controls for resolving nonconforming assets. This process may be supported and documented as part of Seller's Quality Management System (QMS). Typical assets nonconforming elements include:
  - 1. Personnel qualification.
  - 2. Nonconformance forms used for assets.
  - 3. Discrepancy communication and formal initiation.
  - 4. Asset release status identification (visual indicator).
  - 5. Discrepancy disposition response, approval, work-around by Seller and/or Boeing.
  - 6. Closure of the non-conformance.
- B. Any asset identified as deviating from design/definition or causing a product nonconforming condition must be documented in accordance with this document. Nonconforming conditions will be processed per Purchase Contract (Ref. section 1.2 General Requirement) and/or Seller's nonconformance process up to and including potential product impact investigation per section 16.2 (Potential Product Impact).
- C. All nonconformance documented information must be controlled per Seller's Quality Management System (QMS) and maintained per section 19 (Records).
- D. Boeing does not delegate asset nonconformance disposition authority to Seller's.
  - 1. Where Boeing Defense, Space & Security (BDS) procurement supports Boeing accountable and Government own Boeing accountable assets all identified nonconforming conditions will be documented per Purchase Contract (Ref. section 1.2 General Requirements), and submitted to Boeing (ref. section 1.4 Seller Communication) to obtain approved disposition.
  - 2. Where Boeing Commercial Airplanes (BCA) procurement supports Boeing accountable assets Seller may document per internal Quality Management System (QMS) to resolve asset nonconformance condition(s) using current Boeing approved asset design/definition.
    - a. When asset nonconforming condition(s) cannot be resolved with current Boeing approved design/definition, nonconformance documents must be submitted to Boeing (ref. section 1.4 Seller Communication) to obtain Boeing approved disposition.
- E. All Category I (CAT I) master tools identified with nonconforming condition(s) must immediately be documented per Purchase Contract (Ref.

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- section 1.2 General Requirements), and formally submitted to Boeing (ref. section 1.4 Seller Communication) to obtain Boeing approved disposition.
1. A discrepant Category I (CAT I) master tool must not be used until Boeing has provided technical and/or contractual instructions received in writing.
- F. Unless otherwise specified in Purchase Contract (Ref. section 1.2 General Requirements), a nonconformance document that is submitted for disposition will include, at a minimum, the following information:
1. Complete Asset identification as defined on asset (e.g., basic number, code, ownership, revision level, etc.).
  2. Asset unit/duplicate number, when applicable.
  3. Asset Lifetime Serial Number or Purchase Contract serial number, when applicable.
  4. Asset Nomenclature (e.g., defined name, defined function, etc.).
  5. Asset source authority (i.e., design/definition, drawings, digital data, master tool, mylar type layouts) including source authority revision, which was used to determine nonconforming condition.
  6. A complete and concise description of the discrepancies, including source authority “Should Be” and “Is” condition, include drawing location and asset details affected.
  7. Any accepted measurement results to define/identify discrepancy.
  8. Any graphics, sketches, drawings, photographs, or Seller nonconformance record necessary to clarify the discrepancy.
- G. When providing nonconformance documents to Boeing this information must be in English and imperial measurement system when submitting.
- H. Nonconforming assets must not be released to or used by Seller’s manufacturing organization until the asset is corrected per current Boeing design/definition and/or verified per Boeing approved disposition.
- I. Where an alternate manufacturing or asset usage method (e.g., work around plan, limited use process, etc.) has been identified, planned, documented and approved in accordance with Seller’s capability and nonconformance process. All alternate manufacturing method plans must be submitted to Boeing (ref. section 1.4 Seller Communication) for technical approval prior to implementation and use.
- J. An acceptable alternate method plan must, at a minimum, contain the following:
1. Specific and explicit workaround instructions that will ensure resulting production hardware will be in conformance with engineering requirements including Category I (CAT I) master tooling, as applicable.
    - a. Any Category I (CAT I) master tools (gages) determined to be deficient must be brought to the attention of Boeing immediately per section 15.2 D.
  2. Optical location or hand layout methods may be utilized in lieu of asset where critical and/or close tolerance dimensional engineering requirements exist, such as Interchangeable & Replaceable (I&R) items.
  3. The workaround plan duration stated by one of the following:
    - a. Calendar Date, Manufacturing days, Unit numbers, Airplane line/variable number, Lot Number.

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- b. An active asset work authorization order completion date that will correct the discrepant condition.
    - c. A nonconformance report completion date that will correct the discrepant condition.
  4. The Seller's authorization (i.e., Quality Management, Manufacturing Engineering Management, and/or Tooling Management), concurrence and approval of all the above elements is documented.
  5. Seller must coordinate with Boeing (ref. section 1.4 Seller Communication) to obtain contractual instruction for technical approval of any work around plan that is generated where a contractual asset is not used or rework may impact product or product delivery schedule.

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## 16.0 Potential Product Impact

### 16.1 Scope

This section defines the Seller responsibilities to investigate assets to identify and prevent occurrence or reoccurrence of product nonconforming conditions as a result of asset usage. This includes Customer complaints, Seller or Seller subcontractors identified product or asset nonconforming conditions.

### 16.2 Requirements

- A. Asset discrepancies potentially impacting products must invoke a Potential Product Impact (PPI) investigation as defined by Seller's Quality Management System (QMS), i.e., Improvement, Nonconformity, and/or Corrective Action process.
- B. Seller must support Boeing with asset event-based Potential Product Impact (PPI) investigations. Seller must document results of asset related Potential Product Impact (PPI) investigation per Quality Management System (QMS) requirements for corrective and preventative action.
- C. When identified, Seller must document any nonconforming asset within Seller's nonconformance process and identify, document, and segregate nonconforming assets from manufacturing use until asset is corrected or an alternative method is approved per section 15 H&I (Nonconformance).
- D. Asset nonconformance types requiring further investigation for Potential Product Impact (PPI) include but are not limited to the following:
  - 1. A dimension or feature that is out of tolerance and results in a product exceeding engineering definition tolerances.
  - 2. Damage to the asset identified after usage.
  - 3. Incomplete asset used to produce product (e.g., missing parts, sub-assemblies, details, etc.).
  - 4. Asset used with incomplete or missing identification (e.g., missing configuration, acceptance, etc.).
  - 5. Asset used prior to final acceptance (i.e., no evidence of asset acceptance, completed first piece inspection prior to asset acceptance).
  - 6. Missing or altered asset tamper proof measures.Investigation may show that these conditions did not have an adverse effect on the product, however focus on internal process compliance must be addressed to eliminate these asset escapes as required in section 10 (Each Use Condition Checks) and section 13 (Preventive Maintenance).
- E. Seller must notify Boeing (ref. section 1.4 Seller Communication) upon initiation of Potential Product Impact (PPI) investigations where a potential product escape has occurred and make investigation results available to Boeing upon request.
- F. Seller must identify the produced products (designated by serial number, lot number, date codes, any other available means) potentially nonconforming as a result of a nonconforming asset. Seller must ensure any suspect product or work in progress or produced product (in-stock) are verified and/or re-verified per Seller's Quality Management System (QMS) acceptance processes up to and including initiation of nonconforming product documentation.

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- G. Seller must formally and immediately report all assets nonconformance conditions and issues potentially impacting product where a Notice of Escape (NOE) is formally documented per the requirements of this document and Seller's Quality Management System (QMS). Submit formal notifications to Boeing (ref. section 1.4 Seller Communication) per contractual instructions. This activity/process must include products at Seller's and its subcontractors' facilities, and products previously delivered to Boeing.

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## 17.0 Receiving and Shipping

### 17.1 Scope

This section applies to all receipts and shipments of assets by Seller and its subcontractors. Seller and its subcontractors must satisfy the following responsibilities to avoid asset loss and damage during receipt and shipment. This section applies to all Boeing accountable and Government owned Boeing accountable assets.

### 17.2 Requirements

- A. Sellers must maintain documented information to receive and ship assets. Documented information must include formal receipt, accountability, and traceability of all assets, including storage of asset per section 14 (Protection and Storage). Where Seller maintains a Government approved property accountability process, Seller receipt of Boeing accountable Government property must be controlled per Government approved accountability process including any additional requirements of this document where applicable. Seller must formally notify Boeing (ref. section 1.4 Seller Communication) for any asset receiving or shipping related questions or instructions.
- B. Seller must follow requirements of E000 (Supplier Requirements for Buyer/Government/Customer Property Management) and/or D33113-1 (Accountability of In-Plant/Out-Plant Special (Contract) Tools) for any Boeing accountable asset and Government owned asset accountable to Boeing received by Seller.
- C. Assets received or being prepared for shipping or in transit to storage or usage areas must be controlled in such a manner as to prevent corrosion, oxidation, contamination, environmental exposure, damage or loss.
- D. Any asset received or shipped in support of a Boeing Purchase Contract must be controlled per this document. Typical assets received or shipped include but are not limited to:
  - 1. Special Tooling (ST) including mylar type layouts
  - 2. Special Test Equipment (STE)
  - 3. Production Equipment
  - 4. Mechanical Handling Equipment (Overhead and transport)
  - 5. Data Elements (usage instructions, design/definition – including digital data, mylar type layouts, asset reports, etc.)
  - 6. Physical and digital authority assets (Category I CAT I master tools, Master Tooling Parts, Sample Parts, Sample Assemblies, etc.)
- E. Any discrepancies found during receiving or shipping actions, including asset screening must be properly documented and addressed in accordance with Seller's Quality Management System (QMS) and section 15 (Nonconformance).
  - 1. Any Category I (CAT I) Master Tool discrepancies require the Seller to suspend use of the master tool, isolate and control the master per the requirements of this document, and immediately contact Boeing (ref. section 1.4 Seller Communication) for technical and/or contractual instructions.



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- F. All assets will be incorporated into Seller's asset control processes for accountability, use and storage (Ref. section 14 Protection and Storage) including any data element used in support of a Boeing Purchase Contract. Retaining photographs of asset condition at time of receipt is encouraged.

### **17.3 Receiving**

- A. Where an asset is furnished in an "as-is" condition and accepted by the Seller, any repairs, replacement, and/or refurbishment will be at Seller's expense.
- B. Upon receipt all assets must be screened. All screening activity must be accomplished using asset design/definition, Original Equipment Manual (OEM) and/or associated documents. At time of receipt if no design/definition, Original Equipment Manual (OEM) and/or associated documents are provided immediately notify Boeing (ref. section 1.4 Seller Communication) to obtain documents or contractual instructions prior to performing screen activity. Seller must maintain asset screening records (ref. Exhibit A) and control screening records per section 19 (Records).
- C. Asset screening includes at a minimum:
1. Verify the asset identification is accurate and legible as defined per shipping and contractual documentation including evidence of asset acceptance status (Ref. section 8.2K Acceptance).
  2. Verify the tool is in safe working condition and will not present any safety issues.
  3. Visually inspect tools for Foreign Object Debris (FOD), damage, and any visible excessive wear.
  4. Verify accountability of all parts and details of the tool (requires engineering design/definition documentation).
  5. Verify received asset configuration (Ref. section 3.3 Configuration Management) aligns to the asset design/definition, bears evidence of acceptance, (impression stamping, chemical or mechanical etch, or unique identifier).
  6. Review / Verify preventative maintenance, (calibrations, proof load tests labels and certifications, periodic inspection labels) are current and up to date where applicable.
  7. Verify and initiate any preservation activities per section 14 (Protection and Storage).
- D. When receiving Category I (CAT I) Master tool with dedicated Master container (Sealed), Seller must contact Boeing (ref. section 1.4 Seller Communication) 5 days prior to opening any master tool container. Boeing reserves the right to witness the opening and closing of Master tool containers. Seller must request formal technical authorization whenever opening a sealed master container from Boeing (ref. section 1.4 Seller Communication).
- E. When opening Category I (CAT I) Master tool containers the following screening must be performed when authorized:
1. Inspect master tool container for identification, damage and deterioration/contamination.
  2. Verify the integrity of tamper proof seals on containers are intact.
  3. Remove all container seals.

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4. Perform asset screening per 17.3 A, B & C before removing the master or components from the master tool container.
  5. Complete “Tooling Inspection Gage Storage Record (TIGSR)” (X22220). Ensure that current forms are attached to any obsolete forms with similar data to retain historical records.
  6. Complete “Tool Configuration Management Record (TCMR)” (X31068). Ensure that current forms are attached to any obsolete forms with similar data to retain historical records.

## **17.4 Shipping**

- A. Unless otherwise specified per Purchase Contract all shipping of any asset must meet or exceed the minimum requirements as defined in asset Design/Definition, Terms & Conditions (T&C), General Provisions (GP), and/or Special Provisions (SP), including D37522-6 (Supplier Packaging).
  1. Where Purchase Contract specifies Advanced Shipping Notice (“ASN”) and/or submittal of Transportation Plan supplier must follow General Provisions (GP) and D37522-6 instructions prior to asset shipping.
- B. Seller must maintain documented information that defines asset shipping processes that includes but is not limited to the following:
  1. Packing/Packaging – Ensure the packing or packaging provides asset protection to prevent damage and/or deterioration during shipment. (Reference D3951 (Standard Practice for Commercial Packaging) for industry recognized packaging processes).
  2. Cleanliness - Asset must be free of foreign object debris (FOD) and other contaminants which would contribute to deterioration or which would require cleaning by the customer prior to use. Preservatives applied to an asset for protection are not considered contaminants.
  3. Preservation - Assets susceptible to corrosion, oxidization or deterioration (i.e., bare metal, unfinished surfaces, etc.) must be provided protection such as preservative coatings, barrier protection, volatile corrosion inhibitors, and/or substance used as a drying agent such as desiccant packs.
  4. Cushioning / Shoring – During packaging provide any necessary blocking, bracing, cushioning, to prevent asset damage and ensure a safe delivery.
- C. In preparation for shipment, all assets must be screened as defined in section 17.3 B & C. All screening activity must be accomplished using asset design/definition, Original Equipment Manual (OEM) and/or associated documents. If no design/definition, Original Equipment Manual (OEM) and/or associated documents are available immediately notify Boeing (ref. section 1.4 Seller Communication) to obtain documents or contractual instructions prior to packaging and shipping.
  1. Shipment screening must include verification of deliverable records package is complete per section 19 (Records).
  2. No asset with an open nonconformance record will be shipped without formal shipping authorization from Boeing (ref. section 1.4 Seller Communication).
- D. Shipment of Category I (CAT I) Master tool from the Seller’s facility, including to Seller’s alternate locations or a subcontractor requires formal

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- authorization from Boeing (ref. section 1.4 Seller Communication) and must not be shipped until written authorization is received.
- E. Boeing reserves the right to verify Category I (CAT I) Master tool shipping preparation prior to closing/sealing container. When Boeing verification of master tool shipping preparation is identified or required, Seller must contact Boeing (ref. section 1.4 Seller Communication) to coordinate attendance.
  - F. Seller must ensure Category I (CAT I) Master tool shipping containers are free from damage and in a serviceable condition prior to master installation. Master tool containers must prevent environmental or physical damage and allow for safe transportation of master tools.
    - 1. Seller must formally notify Boeing (ref. section 1.4 Seller Communication) for instructions when Master Tool containers are identified with visible damage or missing components.
    - 2. Under no circumstances will a Master tool being prepared for shipping be stored outside regardless if stored in a master tool container or not.
  - G. Category I (CAT I) Master tool screening and preparation must also include the following:
    - 1. Ensure all loose master detail parts (chained parts, bushings, pins, detached assembly components, etc.) are accounted for and in shipping container.
    - 2. All bare metal and critical surfaces must be protected from contamination by applying appropriate preservative to prevent corrosion or oxidization.
    - 3. Ensure all master tool container shoring, supports, and cushioning are in place and functional.
    - 4. Ensure no Foreign Object Debris (FOD) is in master container.
  - H. Where authorization is granted to Seller to conduct Category I (CAT I) Master tool screening, preparation for shipping (Ref. section 17.4 Shipping), and sealing of Master Tool container, Seller must:
    - 1. Verify all contents in the master tool container.
    - 2. Ensure all critical indexing surfaces are protected.
    - 3. Ensure all detail parts are supported and secured within the master tool container.
    - 4. Ensure all Foreign Object Debris (FOD) is removed prior to closure.
    - 5. Complete all sections of the Open/Close Log (Ref. X22220 form). Typically completed while performing a preparation / screening event.
    - 6. Ensure open/close log and master tool design/definition, including when appropriate Configuration Record form is inside container prior to sealing.
  - I. At each Category I (CAT I) Master tool closure event, after the lid/top has been secured, the lid/top will be wired and sealed at two opposite sides or ends, including any latches if applicable. (Ref. D33181-62 Sealing of Master Tools and Containers).
  - J. Seller must formally notify Boeing (ref. section 1.4 Seller Communication) for any shipping related issues or questions to obtain contractual instructions to proceed.

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## 18.0 Post-production and Spares

### 18.1 Scope

This section addresses post-production and spares use of assets including all variations of the terms post-production and spares (e.g., fleet modification programs, upgrade programs, service bulletins, warranty programs, maintenance programs, etc.). The scope covers all categories of Boeing owned and Boeing accountable Government owned assets used to produce Boeing or Government products under a Boeing post-production or spares Purchase Contract.

### 18.2 Requirements

- A. Seller must ensure assets that are defined, fabricated, received, or otherwise provided for the purpose of implementing a post-production or spares program is in compliance with all requirements of this document.
- B. Seller must confirm the asset configuration for the purpose of manufacturing and/or acceptance requirements as defined in Purchase Contract.
- C. Any assets used to support post-production or spares program deemed Configuration Critical, Media of Inspection (MOI) or Inspection Media of product for the purpose of acceptance/inspection requirements must meet the intended configuration as defined in Purchase Contract.
- D. Seller and their subcontractors must have a documented asset post-production process and must keep assets, including stored assets, in a serviceable condition. Seller and their subcontractors must have the following but not limited to:
  - 1. The asset design/definition for the current Boeing accountable asset configuration being used.
  - 2. The applicable latest revision of the Boeing-defined specifications including usage instructions, Original Equipment Manual (OEM) and any required documentation for asset usage.
- E. If asset design/definition is not available at Seller or their subcontractors the Seller must coordinate with Boeing (ref. section 1.4 Seller Communication) to obtain instructions for resolution.

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## 19.0 Records Requirements

### 19.1 Scope

This section defines the requirements for creation, retention and delivery of documented information (records) generated during development, creation, verification, use, maintenance and storage of assets.

### 19.2 Requirements

- A. As defined in this section, records creation, retention, and delivery does not supersede, nor is it intended to contradict with Boeing or Government Property Management requirements (Ref. E000 Supplier Requirements for Buyer/Government/Customer Property Management and/or D33113-1 Accountability of In-Plant/Out-Plant Special (Contract) Tools). Seller must formally address any conflict of requirements with Boeing (ref. section 1.4 Seller Communication).
- B. Seller must retain documented information (Records) to ensure processes were carried out as planned. Records must be controlled and include:
1. Completed results of planned asset processes, including changes. (e.g., work authorization, shop travelers, etc.)
  2. Approved design/definition input and output and revisions, including usage instructions and operation manuals.
  3. Approved change authorization.
  4. Verification results. (e.g., inspection, acceptance, test, etc.)
  5. Special process conformity. (e.g., welding, heat treating, dye penetrant, etc.)
  6. Documentation of nonconforming conditions and dispositions.
  7. Approved /accepted documented information.
  8. Defined retention periods and dispositions, including digital archive, typically asset life cycle or as defined by Purchase Contract.
- C. All records for Boeing owned or Government owned Boeing responsible assets must be made available upon request, including electronic format. Typical asset records include, but are not limited to, the following:
- Certificate of Conformance
  - Proof Load Test Records (Certification)
  - Special Process Records (Certification)
  - Work Authorization Records
  - Inspection Records including digital data
  - Asset Completion Records (Certified Tool List – D141010600, Tool Completion Reports (e.g., MD-2045, DAC26-611), Including invoices, property list, and/or property records submitted in Boeing’s electronic data system - Ref. section 1.2 General Requirements)
  - Screening Records
  - Periodic Inspection Plans (PIP)
  - Periodic Inspection Records / Results
  - Preventive Maintenance Plans (PMP)
  - Periodic Maintenance Records / Results
  - Nonconformance Records

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- D. Unless otherwise specified in Purchase Contract (Ref. section 1.2 General Requirements), the following records must be provided as part of asset shipment when:
1. Seller has executed any Purchase Contract that procures Design/Definition, initial fabrication, rework or modification and delivery of an asset. Records must include the following:
    - a. Certificate of Conformance
    - b. Design/Definition
    - c. Data Elements (usage instruction, manuals, plans, data, etc.) when applicable.
    - d. Proof Load Test Certification (when applicable)
    - e. Special Process Certification (when applicable)
    - f. Inspection/acceptance Records, including build logs & digital measurement records when required.
    - g. Screening Record.
    - h. Nonconformance Records (disposition complete /closed)
    - i. Photograph(s) of asset condition as part of delivery package is encouraged.
  2. Seller has executed a Purchase Contract, including line items that authorizes creation, retention, and usage of an asset the following records, at a minimum, must be provided to Boeing (ref. section 1.4 Seller Communication) upon asset completion:
    - a. Certificate of Conformance
    - b. Asset Completion Records (Certified Tool List – D141010600, Tool Completion Reports (e.g., MD-2045, DAC26-611), Including invoices, property list, and/or property records submitted in Boeing’s electronic data system)
  3. Seller processing an asset as a user closeout and/or return to Boeing, including a Boeing or Government storage facility, relocate asset to alternate location or relocate asset due to Purchase Contract completion or termination, records must include the following:
    - a. Design/Definition
    - b. Data Element Data Elements (usage instruction, manuals, plans, data, etc.)
    - c. Proof Load Test Certification (when applicable)
    - d. Inspection/acceptance Records, including build logs & digital measurement records when required.
    - e. Screening Records.
    - f. Periodic Inspection Records (when applicable)
    - g. Periodic Maintenance Records (when applicable)
    - h. Nonconformance Records (disposition complete /closed)
    - i. Photograph(s) of asset condition as part of delivery package is encouraged.
- D. Records may be submitted via Boeing approved electronic data system (ref. section 1.4 Seller Communication) and/or hard copies as defined in Purchase Contract (Ref. section 1.2 General Requirements), Seller must contact Boeing (ref. section 1.4 Seller Communication) for record delivery process in support of a Purchase Contract.

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## 19.3 Records

- A. Unless otherwise defined per Purchase Contract (Ref. section 1.2 General Requirements), records must meet the following criteria:
1. Certificate of Conformance (CoC) - Must contain a statement indicating the identified asset was manufactured and is conforming to the approved asset design/definition and/or fabrication specification (Ref. Exhibit B).
    - a. Each asset will be documented on an individual single Certificate of Conformance (CoC). Multiple assets may be listed on a single Certification of Conformance (CoC) where duplicate assets are fabricated under a single Purchase Contract.
    - b. Unless otherwise specified by Purchase Contract, a Certificate of Conformance (CoC) will be used to communicate and document asset completion(s) to the Buyer's Authorized Procurement Agent (APA).
    - c. The Certification of Conformance (CoC) will contain but not be limited to the following information documented:
      - 1) Seller Name, address, contact information, BEST Code, manufacturing address (i.e., the address from where the asset was shipped or the asset resides)
      - 2) Date of Certificate of Conformance (CoC) origination (i.e., date the asset was accepted and ready for use)
      - 3) Purchase order number on Purchase Contract
      - 4) Attn: Buyer's Authorized Procurement Agent (APA) - name and contact information.
      - 5) Reference information (Ref section 1.2 General Requirements).
      - 6) Asset design/definition and revision (i.e., digital data-full file name, 2D drawing number, mylar type layout, etc.)
      - 7) Asset description (i.e., asset series if required, asset name, asset number, asset code, asset category, asset type, and brief description of asset function)
      - 8) Asset Life-time or Purchase Contract serial number (when applicable)
      - 9) Seller's asset work authorization document number (i.e., shop traveling, tool order, work order, etc.,)
      - 10) Nonconformance documentation numbers if applicable. (i.e., approved dispositions, use as is, rework, replacement of assets)
      - 11) Signature or acceptance stamp of Seller's QA manager (or their designee) or responsible company officer.
  2. Proof Load Test certificate (Ref. section 8.4 Proof Load Test) will include:
    - a. Seller Information (Name, address, contact)
    - b. Purchase Contract number
    - c. Asset number, name, including serial number as applicable
    - d. All required proof load design/definition (e.g., sheets, diagrams, cases, graphic, etc.) and specification requirements (e.g., duration, compression, tension, torque, etc.)
    - e. List of all proof load test equipment/device (e.g., load cells, scales, weights, etc.) including certification dates and property/identification
    - f. Personnel accountability performing proof load test
    - g. Certificate date, signature and stamp
    - h. Customer acceptance (Boeing witness when applicable)

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- i. Pre/Post Visual and non-destructive examination reports (when applicable)
  3. Inspection/acceptance records (Ref. section 8 Acceptance) will contain at a minimum, but not limited to:
    - a. Actual measurement results “as built” for:
      - 1) All Geometric Dimensioning and Tolerancing (GD&T) explicit defined features regardless of tolerance.
      - 2) All critical tolerances are documented and accepted (+/- 0.015 and less).
      - 3) Evidence of inspection of all features, material, processes, general notes, etc. is required. Statistical sampling and sampling plans are not allowed for asset acceptance.
      - 4) All manual or Coordinate Measurement System (CMS) documented dimensions will be traceable to the person(s) performing the inspection and date it was accepted/completed.
      - 5) Test/Qualification/Functional results when applicable. (Hydraulics, air, vacuum, drilling, fastening, bonding, etc.)
    - b. Coordinate Measuring System (CMS) reporting – Refer to D6-51991 Control of Measurement Equipment.
  4. Special Process Records (Ref. Section 7 Special Processes) will include evidence that all material and special process specification are inspected/verified, including but not limited to the following:
    - a. Welding certification (AWS specification, etc.)
    - b. Nondestructive Test/Inspection certification (Dye penetrant, Mag Particle, Material hardness/tensile, etc.)
    - c. Heat treatment certification (meets Nadcap specifications)
    - d. Stress relief certification (fabrication specification)
    - e. Protective finish (paint, coatings, etc. - fabrication specification)
    - f. Material Finish certification (chrome, cadmium plating, nitride coating, etc. – fabrication specification)
  5. Work Authorization (shop travelers, work orders, tool orders, etc.) Records (Ref. section 4 Asset Design/Definition & section 6 Fabrication, Rework, and Modification) will include, at a minimum:
    - a. Unique Work Authorization number
    - b. Asset identification (unique asset number including series, code, base number, including unit number)
    - c. Asset Serialization (i.e., life time serial number, as applicable per Purchase Contract)
    - d. Coordination data (asset design/definition, authority datasets, gages, mylar type layouts, etc. including all applicable sheets and revisions)
    - e. Specifications (fabrication standards and special process specifications, including revisions)
    - f. Purchase Contract Number (traceable to asset procurement or purchase contract line item procurement.)
    - g. Materials (listing of commercial of the shelf and defined materials)
    - h. Sequential instructions necessary to fabricate, assemble, verify/test (including in-process inspection.)
  6. Seller must maintain asset inspection records or build logs per Purchase Contract (Ref. section 1.2 General Requirements), in support of assets Initial Fabrication, Rework, or Modification (Ref. section 6) and Asset



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Acceptance (Ref. section 8). Inspection records, including build logs may be documented on Seller equivalent forms. Asset inspection records and/or build logs must be provided as part of asset delivery package.

- a. Inspection records, including build log forms (Ref. MAC1147 series forms), at a minimum this documented information (See Section 6.2 D and 8.2 G) must contain the following:
    - 1) Asset number and name (unique asset number including series, code, base number, including unit number, detail number, assembly number etc.) associated with Design/Definition bill of material (BOM).
    - 2) Asset Serialization (i.e., life time serial number, bar codes, as applicable per Purchase Contract).
    - 3) Characteristic Number (traceable identifier assigned to Design/Definition characteristic).
    - 4) Reference Feature Location (location of Design/Definition location – drawing zone, sheet number, Digital Data location, specification callout, etc.).
    - 5) Characteristic Designator (designed characteristic type).
    - 6) Requirement (Specified requirement for the design characteristic (e.g., drawing or DPD dimensional characteristic with associated nominal dimension and tolerances, drawing notes, specification requirements).
    - 7) Results (listing of actual measurements obtained for the design characteristics for each characteristic designator). Including reference to Coordinate Measurement Machine (CMS) results for positional values (CMS results/report must meet D6-51991 Quality Assurance Standard for Digital Product Definition at Boeing Sellers).
    - 8) Nonconformance number (reference number for characteristics found outside design/definition requirements).
    - 9) Signature or acceptance stamp of authorized operator or inspector (traceable to each page of inspection record/build log).
  - b. Where program specific documented information (inspection record, build log form, etc.) is requested, Seller must formally contact Boeing (ref. section 1.4 Seller Communication) to obtain instructions and any requested forms.
7. Seller must maintain Periodic Inspection Plans (PIP) and Periodic Inspection results as part of records retention (Ref. section 9 Periodic Inspection). Seller must retain revision history of Periodic Inspection Plans (PIP) including current and preceding Periodic Inspection results. These records must be made available to Boeing upon request.
- a. Where Boeing Defense, Space & Security (BDS) procurement supports Boeing owned and Government own Boeing accountable assets all Periodic Inspection Results per section 9 (Periodic Inspection) must be sent to Boeing (ref. section 1.4 Seller Communication) within 30 days of completion (Ref. section 9.2 G through L).
  - b. Where assets are recalled by Boeing to perform asset Periodic Inspection actions in support of a purchase contract or Seller is not capable of asset Periodic Inspection (Ref. section 1.3 a. –

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Subcontractor General Requirements) and returned to Boeing, Seller accountability and maintenance of Periodic Inspection results is not mandatory. Seller is still required to maintain asset Periodic Inspection status per section 9 (Periodic Inspection) including Category II listing, recall dates, Subcontractor results, etc.

8. Seller must maintain Preventive Maintenance Plans (PMP) and Preventive Maintenance (Ref. section 13 Preventive Maintenance) results as part of records retention. Seller must retain revision history of Preventive Maintenance Plans (PMP) including current Preventive Maintenance result. These records must be made available to Boeing upon request.
9. Seller must maintain asset nonconformance (Ref. section 15 Nonconformance) history as part of records retention. Where nonconformance documentation is generated Seller must:
  - a. Submit to Boeing for approved disposition.
  - b. Submit nonconformance documentation as part of delivery/shipping package (when applicable).
  - c. Make any nonconformance documentation available upon request.
  - d. Submit nonconformance documentation to Boeing (ref. section 1.4 Seller Communication) and/or Boeing's electronic data system when required.
10. Seller must maintain Screening records (ref. section 17.3 & 17.4) history as part of records retention. Screen records must document (ref. Exhibit A) at a minimum as follows:
  - a. Identifiable information (supplier name, address, date, contract #, shipping number, asset number and revision, ect.).
  - b. Screen event type (Receiving or Shipping).
  - c. Customer notifications and authorizations (e.g. shipping with open nonconformance, Category I (CAT I) master shipping, customer witness, etc.).
  - d. Screening actions (Receiving ref. section 17.3 C & E – Shipping ref. section 17.4 C, G, H & I). and acceptance and rejection status.
  - e. Tracability to any Nonconforming condition identified during Screening event.
  - f. Tracability of inspection / acceptance authority of the individual performing screening event.

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## 20.0 Definitions of General Terms

**Adjustable Datum Feature:** features that are adjustable, identified, and control the designed datum structure of the asset (e.g., surfaces, planes, lines, points, candlesticks, tool balls, and tool buttons).

**Asset:** Property of all kinds, real and personal, tangible and intangible. For purposes of this standard an asset typically includes: Special Tooling (ST), Special Test Equipment (STE), Handling Equipment or Production Equipment and associated data elements.

**Asset Screening -** The process that assures all production assets being received and shipped to/from a Seller facility is visually sound, in working order and built to the appropriate engineering revision.

**Authorized Procurement Agent (APA):** a person with Signature Authority delegated in writing who is authorized to make Purchase Contracts, Commitments, or agreements with Providers of Goods or Services on behalf of The Boeing Company.

**Boeing Accountable Asset:** Asset that is maintained by Boeing Property Management and consists of those asset types that are identified, including serialized assets, and tracked when stewardship or location changes occur. Accountable assets may consist of Government-Furnished Property (GFP), Contractor-Acquired Property (CAP) Customer-Furnished Property (CFP), Government-owned Boeing-accountable assets, and/or Boeing-owned assets.

**Boeing-defined:** Any Boeing Asset definition, fabrication order, inspection plan, periodic inspection plan, work authorization, contract requirements formally released to the Seller.

**Boeing-defined Asset:** Boeing controlled asset definition, fabrication standards / requirements for Boeing accountable asset.

**Capital Equipment:** Instruments, power sources, etc. of a general-purpose nature, which are not charged to a specified contract or are Boeing accountable.

**Certificate of Conformance (CoC):** A type of quality certificate that is certified by a competent authority to verify that the supplied goods or services meet required specifications.

**Configuration Alignment:** The process of ensuring the asset configuration is consistent with product engineering revision levels as defined by contract requirements. All the elements of definition, identification, and disposition of materials, parts, assemblies, and installations, including the complete technical description required to fabricate, test, accept, operate, maintain, and logistically support systems and equipment.

**Configuration Change and Variance Management:** A documented systematic process for identifying, approving and controlling changes and variances to engineering design/definition requirements and product engineering.

**Configuration Control/Management:** The systematic control of an established and approved baseline. Configuration control encompasses establishment of the initial baseline for a work product and all subsequent authorized and approved changes to that baseline. Including the control that ensures the asset configuration is aligned and complete per asset design/definition throughout the asset life cycle until contract closeout.

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**Configuration Critical:** A designation used for any asset because of its use, cost, complexity, or key indexing features being defined or used during the manufacturing process. Assets deemed Configuration Critical require a greater level of oversight.

**Configuration Identification:** Configuration identification is the basis by which product configuration is defined and verified; products are labeled and documented; changes are managed and accountability is maintained. Specifications, drawings, and other types of configuration documentation or data define the configuration identification of a product. The configuration identification of a product may also consist of additional product information, such as technical manuals and users manuals, that is derived from the configuration documentation or data. Proper configuration identification is essential to provide technical and contractual control, verification, and approval for product configurations and their interfaces.

**Control Media:** Assets made from masters, fixtures, gages, and templates and other devices or appliances necessary for maintaining interchangeability or replaceability. Items will be built with control media established and/or approved by the prime contractor.

**Coordinate Measurement Systems (CMS):** A manually or numerically driven system for dimensional measurement of parts/tools that may be comprised of hardware and software capable of producing measurement results output in various formats (e.g., Coordinate Measurement Machine (CMM), Laser Tracker, Photogrammetry).

**Design / Definition:** Asset engineering that has gone through the verification process and is ready for release and use. Asset engineering is defined by either a model or dataset package and/or 2D drawing set that identifies and specifies components and their integration into the complete asset (i.e., Special Tool (ST), Special Test Equipment (STE) or Equipment) satisfying explicit and implicit fit, form, function, performance, capacity, and financial requirements including any constraints, resulting in configuration, specifications and bill of materials (BOM) required to produce the asset.

**Digital Product Definition (DPD):** The electronic data elements that specify the 3D Computer Aided Design (CAD) geometry and all design requirements for a product (including notation and parts lists), and the use of this data throughout an integrated CAD/Computer Aided Manufacturing (CAM) and Coordinate Measurement Systems (CMS).

**Documented Information:** May consist of documentation, quality manual, documented procedures, and records. The structure and content of documented information related to a quality management system relates to both the processes operated by the organization and information maintained for other purposes.

**End-Item:** Category II Special Tools (ST) used to produce, control and/or accept production end items (i.e., detail parts, assemblies) where Special Tools (ST) are the only method of product acceptance. This includes Major End-Item Assembly tools used to produce, control, and/or accept Interchangeable and Replaceable (I&R) Items, Replaceable Items, Replaceable-Interchangeable at Attach Points Only Items, or Interchangeable and Replaceable (I&R) Match. Typically, end-item tools special requirements for Seller fabrication and use are identified per Design/Definition or Purchase Contract requirements.

**Equipment:** A tangible asset that is functionally complete for its intended purpose, durable, nonexpendable, and needed for the performance of a contract. Equipment is not

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intended for sale, and does not ordinarily lose its identity or become a component part of another article when put into use. NOTE: Equipment does not include material, real property, special test equipment (STE) or special tooling (ST).

**Fit - As used in the phrase “Fit/Form/Function”:** The ability of critical features of an item to physically interconnect with or become an integral part of another item utilizing the same attachment or mounting and mating surface as defined by the product definition data (PDD) [drawing/model based definition (MBD)] or tool use instructions.

Example: A circumstance where the tool is unable to nest, index, mate, or be properly offset per design.

**Form - As used in the phrase “Fit/Form/Function”:** The shape, size, dimensions, mass, weight, other key characteristics or critical dimensions which uniquely characterize an item. Other physical parameters will include the ability of the item to function continuously in all respects within the original design envelope as defined by the PDD (drawing/MBD). Example: The tool has had unauthorized parts, details, or material added or deleted or deformation that precludes intended use.

**Function - As used in the phrase “Fit/Form/Function”:** The actions and properties that an item is designed to perform and possess in relation to critical dimensions and critical features as defined by the PDD (drawing/MBD). These actions and properties include, but are not limited to, performance, operation, safety, strength, reliability, compatibility, and maintainability. Example: The tool has been rendered non-functional for intended use by significant damage, wear, or if systems related cannot perform without them.

**General Purpose Equipment:** Items that are not unique to any specific contract or purchase order and is used to support production of parts or assemblies on multiple products and/or programs (e.g., Portable/Perishable Tools, Hand Tools). As such these tools are Seller-owned assets and are not accountable to Boeing under a Property Management procurement clause.

**Government - Furnished Property (GFP):** Property in possession of, or directly acquired by, the Government and subsequently furnished to the contractor for performance of a contract. Government-furnished property includes, but is not limited to, spares and property furnished for repair, maintenance, overhaul, or modification. Government-furnished property also includes contractor-acquired property if the contractor-acquired property is a deliverable under a cost contract when accepted by the Government for continued use under the contract.

**Government Property:** All property owned or leased by the Government. Government property includes both Government furnished and Contractor acquired property. Government property includes material, equipment, special tooling (ST), special test equipment (STE) and real property. Government property does not include intellectual property and software.

**Master Tool:** A physical or digital source tool that includes interface control tools, master control tools, master models, master gages, secondary gages, master templates, master control drawings (MCD's), and master tooling parts. Master tools are commonly referred to as Category 1 (CAT I) special tools, used as the configuration and fabrication authority to establish basic nominal dimensional values for a tooling family. Master tools are used in the construction, acceptance, and periodic inspection of special tools (ST) and other assets.

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**Media of Inspection (MOI):** Asset designated for use in verifying product features or characteristics of parts or assemblies are in compliance with engineering definition requirements where designated Asset is the only means being used for acceptance.

**Modification:** An authorized physical change to an asset where asset design/definition changes affecting fit, form or function are incorporated to ensure configuration alignment.

**Nadcap Accreditation:** An aerospace industry managed accreditation program administered by the Performance Review Institute (PRI).

**Open/Close Log:** A log or form (X22220 or equivalent) used to document when a Category I (CAT I) master tool storage container is opened or closed while performing a screening event.

**Overhead Mechanical Handling Equipment:** Any device used for lifting materials, assemblies, fixtures, equipment, etc., that are made wholly or partially of materials such as alloy steel chain, wire rope, metal mesh, synthetic webbing, welded adapters or any combination thereof.

**Periodic Inspection:** Asset inspections performed and recorded on a periodic inspection plan at a prescribed interval. Periodic inspections include physical dimensional measurements and/or visual verifications.

**Post-production and spares:** Refers to the phase of a products life cycle after delivery to a Boeing customer that includes post - delivery support and re-procurement of parts and assemblies.

**Potential Product Impact (PPI):** A process of asset nonconformance analysis for the potential impact to product features established or checked by the asset that may result in nonconforming product.

**Preventive Maintenance Plan (PMP):** PMP is a process that defines, plans, and completes specified maintenance tasks intended to provide timely inspection, maintenance, and lubrication of contract tools to minimize malfunction or failure due to wear or neglect.

**Repair:** Asset maintenance, which is necessary to keep assets in a serviceable condition and defined configuration. Repair is limited to asset maintenance items which do not alter asset configuration and/or affect fit, form or function of an asset.

**Rework:** The altering of the asset, such as fit, form or function, including the configuration of an asset to accommodate engineering changes, changes to asset usage, and resolving asset nonconforming conditions.

**Seller Accountable Assets:** A production configured asset owned by the Seller to produce product to support Boeing purchase contracts.

**Seller-defined:** Any Seller asset definition, fabrication plan, inspection plan, periodic inspection plan, work authorization and physical asset controlled by Seller's Quality Management System. Seller controlled asset definition, fabrication standards/requirements for Seller accountable assets.

**Serviceable Condition:** In good working condition, without damaged or missing components, excessive wear, or any other conditions preventing an asset from performing its intended function.

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**Shop Aid / Manufacturing Aid Tools:** A shop-made device to assist a particular assembly/fabrication operator to do an operation more efficiently but is not required to do the job every time. A shop aid is a non-designed, non-certified expendable item fabricated and used by the factory during the manufacturing process that are consumed or expended during a specific manufacturing process for which it was fabricated. Shop Aids must not include any items that fall under the descriptions of equipment, special tooling (ST), special test equipment (STE), or material. Shop aids are:

- Control is dictated by functional/using department,
- Generally a low cost item (e.g.,: less than \$1,000.00),
- Not required to do a job,
- Not called out in work instructions,
- Not used to control a design feature of a part or manufacturing process,
- Never used for work acceptance of parts or processes,
- Never used to control interchangeable features or replaceable parts,
- Never used as a lifting device or test aid of any kind,
- Never used as a safety item or for ergonomics, and
- Never retained for follow-on use after completion of the specific manufacturing process for which it was fabricated.

**Special Test Equipment (STE):** Single or multi-purpose integrated test units engineered, designed, fabricated or modified to accomplish special purpose testing in performing a contract. It consists of items or components that are interconnected and interdependent so as to become a new functional entity for special testing purposes. It does not include material, special tooling, facilities (except foundations and similar improvements necessary for installing special test equipment), and plant equipment items used for general plant testing purposes.

**Special Tooling (ST):** Jigs, dies, fixtures, molds, patterns, other equipment and manufacturing aids, all components of these items, and replacement of these items, which are of such a specialized nature that without substantial modification or alteration their use is limited to the development or production of particular services or parts thereof or to the performance of particular services. It does not include material, special test equipment (STE), facilities except foundations and similar improvements necessary for installing special tooling (ST), general or special machine tools, or similar capital items.

**Specification:** A document containing specific requirements for the design/definition, fabrication, and inspection of an asset. Typically authored by Boeing and provided to Seller for the purpose of asset identification of critical functionality, including but not limited to, control, definition development, and fabrication.

**Validation:** Confirmation, through the provision of objective evidence, that the defined requirements for a specific intended use or application have been fulfilled. Validation may include full or partial measurement, testing, simulation or other techniques as needed. Typically validation is a determination not a task.

**Verification:** Confirmation that defined requirements have been fulfilled. Verification includes measurements, testing, simulation, modeling or other techniques, as needed, to document acceptance evidence. Typically verification is a physical task and not a determination. Asset verification consists of three types: minor verification; major verification assembly, and major verification fabrication. (See section 8.3 Asset Acceptance Methods for details of each type.)

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**Work Authorization:** Any approved document (e.g., Contract, Non-Conformance document, Tool Order, Work Order, and Shop Traveler) that authorizes work to be performed.



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## 21.0 References

AS9100, “Quality Management Systems – Requirements for Aviation, Space and Defense Organizations”

AS9102, “Aerospace First Article Inspection Requirement”

D3951, “Standard Practice for Commercial Packaging for industry recognized packaging processes”

D32028-1, “General Requirements for Tooling Welding”

D33011-0, “Boeing Tool Design Document”

D33011-23, “Stress Analysis for Engineering”

D33041-0 through -17, “Boeing Tool Identification Codes”

D33042-1, “Boeing Special Test Equipment, Agency Peculiar Property, and Plant Equipment Identification”

D33113-1, “Accountability of In-Plant/Out-Plant Special (Contract) Tools”

D33181-40, “Tool Identification”

D33181-62, “Sealing of Master Tools and Containers”

D33200-1, “Boeing Supplier’s Tooling”

D33207-1, “Supplier Statement of Work for Special Tooling and Special Test Equipment - BDS, BR&T, BT&E, BGS (Government Programs)”

D37522-6, “Seller Packaging”

D6-51991, “Quality Assurance Standard for Digital Product Definition at Boeing Sellers”

D950-11288-1, “Product Definition Template (PDT) Requirements, Validation and Verification Processes, and Handling Instructions for Plot Centers and Seller Use”

E000, “Supplier Requirements for Buyer/Government/Customer Property Management”

MAC1147S, “Tool Build Log Summary”

MAC1147DA, “Tool Build Log Detail Accountability”

MAC1147CS, “Tool Build Log Construction Point Sketch”

MAC1147DB, “Tool Detail Information”

MAC1147E, “Tool Build Log Hole Pattern”

MAC1147D, “Tool Build Log Documentation”

MAC5420, “Quality Calibration Log”

AM0044, “Laminate Tool Build Log”

X22220, “Tooling Inspection Gage Storage Record (TIGSR)”

X30613, “Gageless Tooling Conversion Request”

X31068, “Tool Configuration Management Record (TCMR)”

X35200-2, “Gated Tool Design Record”

## Exhibit A Example Asset Screening Record

<b>Supplier Name &amp; Address:</b>		Hawks Aviation LLC (HAL) 12345 Aero Ave. Everett, Wa. 98201			
<b>Tool Number</b>	<b>Rev.</b>	<b>Screening Event</b>	<b>Shipper #</b>	<b>P.O. / Order #</b>	
FAJ112W1000-1	New	Receiving <input type="checkbox"/> Shipping <input checked="" type="checkbox"/>	ZYX321	9876543	
<b>Design / Definition Used</b>	<b>NCR Issued</b>	<b>NCR / CA #</b>	<b>Customer Notification / Shipping Authorization Required</b>		
Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
			Accep t	Reject	
1	Verify the asset identification is accurate and legible as defined per shipping and contractual documentation including evidence of asset acceptance status.				
2	Verify the tool is in safe working condition and in servicable condition.				
3	Visually inspect tools for Foreign Object Debris (FOD), damage, and any visible excessive wear.				
4	Verify accountability of all parts and details of the tool (requires engineering design/definition documentation).				
5	Verify received asset configuration aligned to asset design/definition, bears evidence of acceptance, (impression stamping, chemical or mechanical etch, or unique identifier).				
6	Review / Verify preventative maintenance, (calibrations, proof load tests labels and certifications, periodic inspection labels) are current and up to date where applicable.				
7	Verify receiving no contamination (oxidization or corrosion). Shipping verify / initiate application of preservation compound.				
<b>Category I (Master control tools, Master Gages, Etc.) Including 1-7</b>					
9	Inspect master tool container for identification, damage and deterioration/contamination.				
10	Verify the integrity of tamper proof seals on containers are intact when Receiving.				
11	Customer notification and witness Open / Close complete, when required.				
12	Complete or update all sections of Open / Close Log - Tooling Inspection Gage Storage Record (TIGSR), Tool Configuration Management Record (TCMR), including of hard copy of Tool Design Drawing.				
13	Open / close log and hard copy of Tool Design Drawing in Master container, container sealed at two opposite sides or ends, including any latches if applicable.				
14	Customer shipping authorization received.				
<b>Comments:</b>			<b>Date</b>		
			<b>Acceptance</b>		

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## Exhibit B

### Example Certificate of Conformance

Hawks Aviation LLC (HAL)  
12345 Aero Ave.  
Everett, Wa. 98201

Date: 1/21/2017  
From: John Doe  
Title: Quality Manager  
BEST code: BE2003286

Attn: G. Buss (BCA SM-PA)

Subject: Certificate of Conformance for FAJ112W1000-1 Unit 3 Boeing S/N 1234567 "777 L/H Rear Spar Assembly Jig"

This Certificate of Conformance is used to document the conformance of FAJ112W1000-1 to the contract purchase order requirements contained in PO# 9876543 and the approved tool design as follows;

- 1) Tool drawing FAJ112W1000-1 sheet 1 rev "New"
- 2) Tool drawing FAJ112W1000-1 sheet 2 rev "A"
- 3) Tool drawing FAJ112W1000-1 sheet 3 rev "New"
- 4) Tool drawing FAJ112W1000-1 sheet 4 rev "B"
- 5) Tool drawing FAJ112W1000-1 sheet 5 rev "A"
- 6) Tool drawing FAJ112W1000-1 sheet 6 rev "A"

HAL has completed all of the fabrication and inspection operations as documented on internal work order #1357911. HAL has determined that the 777 Left Hand Rear Spar tool (FAJ112W1000-1) is compliant to the purchase order and the tool design requirements. The CoC encompasses all tool design requirements; i.e., tool feature location, material(s), quantities, flag notes, special purchase items and includes the following special processes used to fabricate the tool:

- 1) D32028-2 Rev. M (welding/stress relief)
- 2) D33181-53A Rev. A (ERS establishment)
- 3) D33181-40 Rev. L (tool identification)

Nonconformance:  
SNN 1234567 (HAL CAR# 7654321)

Respectfully,  
*John Q Fab*  
John Q Fab

HAL Quality Manager

*January 21, 2019*  
Date

## Appendix A

Production Equipment and Special Tooling Quality Standard Document Map			
	AS9100 D		AS9102 B
Introduction and General Requirements	7.2 7.3 7.5.1 8.2.1	8.4 8.4.1 8.4.2	
Seller Asset Capability	7.2 7.3	8.4	
Configuration Management	8.1.2	8.2.1	
Engineering Design/Definition	8.2.1 8.3	8.3.6	
Data Elements	8.2.1 8.5.1	8.5.3 8.5.5	
Fabrication, Rework, and Modification	8.1 8.2.1 8.5	8.5.5 8.5.1	
Special Processes	8.4 8.4.2	8.5.1	
Acceptance	7.1.5 7.1.5.1	8.5.1.1 7.1.5.2	
Periodic Inspection	8.2.1 8.5.1.1 7.1.5	8.7 7.1.5.1 7.1.5.2	
Each Use Condition Check	8.5.1.1	8.7	
Manufacturing Work Instructions	8.1 8.2.1	8.5.5 8.5.1	
Production Process Verification and Asset Relationship	8.2.1 8.5.1.3	8.6 8.5.1.1	5.2 5.5.3 5.3
Preventive Maintenance	8.1 8.2.1	8.7 8.5.1.1	
Protection and Storage	8.5.1.1 8.5.4	8.7	
Nonconformance	8.2.1	8.7	
Potential Product Impact	8.2.1 8.7	10.2	
Receiving and Shipping	8.2.1 8.2.2 8.4.3	8.7 8.6 8.5.4	
Records	8.4.3 8.5.1 8.5.1.2 8.5.1.3 8.5.2 8.5.3	10.2 9.1.1 8.7.2 8.6 8.5.6	
ST Use for Post-production and Spares	Applies as above		
Definitions of General Terms	Applies as above		

## Appendix B Document Revision Record

Rev	Section	Change	Rationale
A	Table of Contents	Added section 1.3 and appendix B.	Improvement. Standard technique for documenting revisions.
	Definitions	Deleted First Product Inspection, added Periodic tool Inspection and ST Validation.	Align with IDS common process.
	Section 1	Added new section 1.3, References.	Clarification.
	Section 3; Table 1	Added provision to contact Boeing for clarification; added “periodic” to inspection requirements.	Clarification.
	Section 4, 4.2	Added contract requirement language.	Improvement.
	Section 5, 5.2, 5.2.5	Revised title and paragraph to focus requirement at Seller level and remove from user level.	Align with generally accepted industry practices.
	Section 6, 6.2	Added requirement C.	Improvement.
	Section 7, 7.2	Added delegation requirements statement when using third party.	Clarify requirement specifically for acceptance delegation.
	Section 8, 8.2	Added computer measurement system requirements; added item 7, ST validation paragraphs; deleted FPI language.	Allow usage of advanced measurement equipment without DPD approval. Align with IDS common process.
	Section 9, 9.2	Deleted item 8.	Align with change in 5.2.5.
	Section 10, 10.2	Revised formatting; added change in MOI designation communication requirement; added delegation requirements when using third party.	Clarification.
	Section 11, 11.2.2	Added contract compliance requirement, change requirement; deleted item 8.	Clarification.
	Section 13, 13.2, 13.2.2	Revised wording.	Clarification.
	Section 18, 18.2	Added requirement to enter received ST into Seller’s approved control process.	Improvement.
Section 19, 19.2	Added not in use to in use communication requirement.	Process improvement.	
Requirements sections	Added alphabetical identification to each requirement within the section.	Eliminate confusion when referencing a specific requirement.	

Revision Letter **A**

Changes in This Revision See appendix B.

Authorization for Release

AUTHOR:	William J. Petry	3H1	Sept 17, 2009
		Org. Number	Date
APPROVAL:	Thomas J. Spiegel	D500	Sept 17, 2009
		Org. Number	Date
DOCUMENT RELEASE:	Ngoc H. Bui	G-823A	Sept. 23, 2009
		Org. Number	Date

Rev	Section	Change	Rationale
B	Title	Changed IDS to BDS	Update of company business unit name
	Section 1.1	Added AS9100 revision level, Rev B	Clarification
	Section 1.2	Added “accountable to Boeing,” and business unit name update	Clarification of applicability to only those Government ST accountable to Boeing
	Section 3.2	Removed must and replaced with must	Clarification
	Section 4.2.A	Added seller subcontractor controls element	Clarification
	Section 5.2.1	Added instructions behind ST usage	Clarification
	Section 7.2.C.2	Added computer measurement system provision	Clarification
	Section 7.2.C.4	Added authorization requirement	Clarification
	Section 8.2.G	Added alternative method for evidence of acceptance	Alignment with AS9100 Rev B
	Section 11.2.2.B.5	Removed “coordination” and replaced with “notification”	Clarification
	Section 18.2.2.C	Restructured prior to shipping requirements from paragraph to listed requirements	Clarification
	Section 18.2.2.E	Reworded requirement to “adequately preserve and protect”	Clarification

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Revision Letter **B**  
Changes in This Revision See appendix B.  
Authorization for Release

AUTHOR:	<u>William J. Petry</u>	<u>3H1</u> Org. Number	<u>Oct 29, 2010</u> Date
APPROVAL:	<u>Thomas J. Spiegel</u>	<u>D500</u> Org. Number	<u>Oct 29, 2010</u> Date
DOCUMENT RELEASE:	<u>Charlene J. Gerken</u>	<u>9M-ST-EUB0</u> Org. Number	<u>Nov. 2, 2010</u> Date

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Revision Letter **C**  
Changes in This Revision Revised verbiage in Section 10.2 item D. 7  
Authorization for Release

AUTHOR:	<u>Albert C Hodge-Jr</u>	<u>GT-01-3H2</u> Org. Number	<u>Nov. 29, 2011</u> Date
APPROVAL:	<u>Joseph K. Lonigro-III</u>	<u>GT-01-3H1</u> Org. Number	<u>Nov. 29, 2011</u> Date
DOCUMENT RELEASE:	<u>Rebecca Byers</u>	<u>9M-ST-EUB0</u> Org. Number	<u>Nov. 29, 2011</u> Date

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Revision Letter **D**  
Changes in This Revision Added word "technical" to content owner statement on page and also added verbiage on page 1 stating Jeff Webb has RAA for ISE ownership  
Authorization for Release

AUTHOR:	<u>Albert C Hodge-Jr</u>	<u>GT-01-3H2</u> Org. Number	<u>Feb, 23,2012</u> Date
APPROVAL:	<u>Jeff Webb</u>	<u>HM-01-D50A</u> Org. Number	<u>Feb, 23,2012</u> Date
DOCUMENT RELEASE:	<u>Charlene J. Gerken</u>	<u>9M-ST-EUB0</u> Org. Number	<u>Feb, 23,2012</u> Date

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Revision Letter

**E**

Changes in This Revision

Added NEW content owner on page 1 and also added verbiage on page 1 stating Timothy R. Ditch has RAA for Quality Ownership

Authorization for Release

AUTHOR:	Albert C Hodge-Jr	GT-01-3H2	Aug 24, 2015
		Org. Number	Date
APPROVAL:	James R. Peth	HM-01-D50A	Aug 24, 2015
		Org. Number	Date
DOCUMENT RELEASE:	Alicia E. Otero	9M-ST-EUB0	October 6, 2015
		Org. Number	Date

Rev	Section	Change	Rationale
F	Document Information	Added Non Proprietary statement; Add requirement to use most current document; Revised all instances of "shall" to "must".	Clarification and missing requirement; document administration decision
	Table of Contents	Revised page numbers and added new section references.	Required to align with added requirement sections
	Section 1.1	Removed AS9100 revision references; Added AS9100 name; Added FAR references; Added Mylar reference; Added ST exclusion types. Revised All Special Tooling (ST) references to ST acronym throughout document.	Clarification of requirements applicability in introduction and to maintain term uniformity in document
	Section 1.2	Revised applicability statement; revised documentation requirements; revised internal audit requirements; revised surveillance and Boeing ST determination requirements; added Boeing provided ST definition requirement; added data system element; added ST usage and alternate method requirement.	Clarification of requirements
	Section 1.2.1	Added Seller subcontractor general requirements section; added definition to flow-down requirements to subcontractors; added Seller responsibility for subcontractor approvals.	Clarification and missing subcontractor control elements to align with AS9100
	Section 1.3	Added reference to Mylar controls; Add references to unique ST form documents.	Additional control elements identified to improve ST documentation



Rev	Section	Change	Rationale
F	Section 2	Added Boeing Defined Definitions; Revised Boeing-Defined ST to add ST elements; Added Capital Equipment definition; Revised Configuration Alignment definition; Revised Configuration Management definition to add ST life cycle and contract elements; Added General Purpose Tools definition; Revised Media of Inspection definition; Added Overhead Mechanical Handling Equipment definition; Added Post Production Spares definition; Added Seller-defined definition; Added Seller Owned ST definition; Added Shop Aid Tool definition; Revised ST Specification definition; Added CMS definition; revised Periodic Inspection to Periodic Tool Inspection throughout document; Added Special Test Equipment (STE) definition.	Required definitions to terms used throughout the document and clarification to existing definitions and to maintain term uniformity in document
	Section 3.1	Revised Category I description.	Clarification
	Section 3.2	Revised Category II description.	Clarification
	Section 3.3	Added Boeing right of ST category determination and buyer communication.	Clarification
	Table 1	Revised Category II description; Added evidence of ST acceptance requirement; added referred to terminology; added Cat II requirement; Added Cat II requirements per section 10.	Clarification
	Section 4.2	Revised B. Proficiency Statement; Revised C & D for Boeing communication requirements.	Clarification
	Section 5.2	Revised Boeing communication requirement.	Clarification
	Section 5.2.1	Added obtain ST definition instruction; Revised Boeing communication. Requirement.	Clarification
	Section 5.2.3	Revised Configuration elements; Revised Boeing communication requirement.	Clarification
	Section 5.2.4	Revised Boeing communication statement.	Clarification
	Section 5.2.5	Revised B - for Boeing communication requirements; Added C - added conditions for configuration alignment, contract changes and coordination.	Clarification
	Section 6.2	Revised C – added CMS acronym; Revised D – ST definition approval and Boeing communication requirements; added a) & b) element to add seller owned ST responsibility; Added D – ST definition approval conditions; Revised E – Tolerance requirements and added ASME Y14.5 requirement; Revised G – changed ST history retention requirement.	Clarification and addition of missing control elements to align with AS9100 and industry recognized standards
	Section 7.2	Revised B – ST work authorization requirement examples; Added C – ST work authorization elements; Added E – Mylar control requirement and examples; Revised G.3 – for third party approval and control requirements.	Clarification and addition of missing control elements to align with AS9100 and industry recognized standards

Rev	Section	Change	Rationale
F	Section 8.1	Added requirements to ST Acceptance scope.	Clarification for intent of section
	Section 8.2	Removed B - CMS requirements; Added new B – including in-process and final ST acceptance parameters, use of build records and feature control elements. Revised C 3.- added End item MOI and reference to section 10; Revised D – added formal communication requirement; Revised F 1&2- defined permanent marking; clarified alternate marking method.	Clarification and addition of missing control elements to align with AS9100 and D6-51991
	Section 8.2.1	Added Section 8.2.1 A thru C detailed CMS control requirements and NADCAP recognition requirements.	Clarification and addition of missing control elements to align with AS9100 and D6-51991
	Section 9.2	Added E – ST definition retention and communication requirements.	Clarification
	Section 10.2	Revised and added A – Relocated and added condition requirement from section 3 (3.2.1 and 3.2.2) rev E; Add C – Seller determination of MOI status and conditions; Added C conditions 1&2. – retains ST definition; retains product definition; Added initial MOI determination meet section 8;PTI exclusion process and condition requirement; Added D - elements for out of production spares, PTI exceptions, and excess ST notification requirements; Revised E – submittal of seller created PTI plans to Procurement; Revised G & H – Mandatory requirement to send PTI results to procurement; Revised L – Seller changes and Boeing determination for PTI; Revised M 3 – For third party approval and flow-down; Added N – request for PTI extensions. Added O – PTI delinquency requirements / instructions and communication requirements.	Clarification of section scope and intent and addition of missing control elements to align with AS9100
	Section 10.3	Added section 10.3 – relocated requirement from section 11.2.4 rev E.	Clarification of section scope and intent
	Section 11.2.2	Revised B- as specified by contract; Revised B 1 – Added ST code examples; Revised B 2 – defined basic identification elements; Revised B 3 – Added contact and program elements; Revised B 5 – loose detail identification requirements; Revised C – for Boeing communication and identification change control.	Clarification
	Section 11.2.3	Revised A – Removed “intent” and added “developed and utilized”; Added 2. Boeing –defined a) – verify latest TUI usage revisions.	Clarification

Rev	Section	Change	Rationale
F	Section 12.2	Revised B – documenting tool use instruction on planning; Revised D – Boeing Communication requirements.	Clarification
	Section 14.2	Added – maintain documented process for ST maintenance; Revised A – clarified ST excessive ware instructions; Revised B – clarify formal request for ST definition; Added E & F –Boeing communication requirements.	Clarification and addition of missing control elements to align with AS9100
	Section 15.2.2	Added A – contract termination, accountability and ST excess notification requirements.	Clarification
	Section 16.2	Revised A – Added quality management system nonconformance elements; Revised C – Boeing communication requirements; Revised E – Added examples of alternate methods and approvals; Added F – defined alternate methods and conditions.	Clarification
	Section 16.3	Revised - Added nonconformance elements when reporting.	Clarification
	Section 17.2	Revised A – added quality management system CA investigation documentation requirements; Added D – Boeing notification and results requirements; Revised F – Boeing communication requirements.	Clarification
	Section 18.2	Added C – ST must meet section 8 ST Acceptance requirements;	Clarification and addition of missing control elements to align with AS9100
	Section 18.2.1	Added C – ST receiving accountability and data system update requirements; Added D – Obtain ST definition when not received with ST as part of receiving insp.	Clarification and addition of missing control elements to align with AS9100
	Section 18.2.2	Added C – ST subcontractor shipping accountability and data system update requirement; Revised D.2 to add mandatory examples; Revised E –Submit nonconformance prior to shipping; Revised H 1 thru 6 – shipping question clarification; Added - Obtain Boeing authorization to ship ST without definition.	Clarification
	Section 19.2	Revised C – added PTI and contact requirement; Revised D – defined post production process requirements, obtain ST definition and Boeing communication requirements	Clarification
	Appendix A	Revised AS9100 and AS9102 to align with Rev F.	Clarification to AS9100 and AS9102

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**F**

See appendix B.

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**G**

Complete rewrite to combine contractual requirements for the creation of one contract document for BDS and align with BCA and BGS Enterprise requirements. Retains all original requirements (new through revision F). Includes realignment, restructure, additional/revised terminology and expanded requirements for Production Equipment and Special Test Equipment (STE).

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