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Special Tooling and Special Test Equipment Quality Standard

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Table of Contents

1.0 Introduction and General Requirements
- 1.1 Introduction....6
- 1.2 General Requirements....6
- 1.3 Subcontractor General Requirements....8
- 1.4 Seller Communication....9
- 1.5 Internal Audits....9

2.0 Seller Asset Capabilities
- 2.1 Scope....10
- 2.2 Requirements....10

3.0 Configuration Management
- 3.1 Scope....12
- 3.2 Requirements....12
- 3.2.1 Boeing-defined Assets....12
- 3.2.2 Seller-defined Assets....12
- 3.3 Seller Asset Periodic Inspections and Asset Acceptance....13

4.0 Asset Design/Non-Design Definition
- 4.1 Scope....14
- 4.2 Requirements....14
- 4.3 Design/Definition Approval....15
- 4.4 Design/Definition Requirements....15

5.0 Fabrication, Rework, and Modification
- 5.1 Scope....17
- 5.2 Requirements....17
- 5.3 Initial Fabrication, Rework, and Modification....17
- 5.4 Asset Identification....18
- 5.5 Asset Material....18
- 5.6 Coordinate Measuring Systems (CMS) Measurement....19
- 5.7 Asset Usage Instructions....19
- 5.8 Master Coordination....19

6.0 Special Processes
- 6.1 Scope....21
- 6.2 Requirements....21

7.0 Acceptance
- 7.1 Scope....21
- 7.2 Requirements....22

7.3 Asset Acceptance Methods. 23
7.4 Proof Load/Pressure Test……..25

8.0 Periodic Inspection
8.1 Scope. 26
8.2 Requirements…. 26
8.3 Periodic Inspection Plans… 28

9.0 Each Use Condition Checks
9.1 Scope… 30
9.2 Requirements. 30

10.0 Manufacturing Work Instructions
10.1 Scope. 32
10.2 Requirements…. 32

11.0 Production Process Verification and Asset Relationship
11.1 Scope… 32
11.2 Requirements. 32
11.3 Communication Requirements… 33

12.0 Preventive Maintenance
12.1 Scope. 33
12.2 Requirements…. 33
12.3 User Maintenance. 34
12.4 Preventive Maintenance 35

13.0 Protection and Storage
13.1 Scope. 35
13.2 Requirements…. 36
13.3 Assets Not in Use… 36

14.0 Nonconformance
14.1 Scope. 36
14.2 Requirements…. 36

15.0 Potential Product Impact
15.1 Scope. 39
15.2 Requirements…. 39

16.0 Receiving and Shipping
16.1 Scope. 40
16.2 Requirements. 40
16.3 Asset Screening Receiving / Shipping. 40

16.4 Shipping…..41
16.5 CAT I Master Tool Receiving and Shipping… 42

17.0 Records Requirements
17.1 Scope. 43
17.2 Requirements.....43
17.3 Records….....44

18.0 Definitions of General Terms… 48

19.0 References….....54

List of Tables:

Table 1: Seller Approval Capability Level Requirements… 10
Table 2: ST Category Description and Inspection Requirement Summary..... 11

Exhibits:

A. Example of Screening Report. 55
B. Example of Certificate of Conformance (CoC). 56

Appendix:

A. Quality Standard Document Map. 57
B. Change Record. 58

1.0 Introduction and General Requirements

1.1 Introduction

This document defines The Boeing Company quality requirements for 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. Refer to Appendix A for the correlation between this document and the applicable AS9100/AS9102 section requirements.

This document applies to all Boeing-owned assets and Government-owned assets and Seller-owned assets that are accountable to The Boeing Company. Boeing procurement may include asset design/non-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 and Special Test Equipment (STE).
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 standards.

1.2 General Requirements

All assets must meet the requirements of this document and D33207-1 (Supplier Statement of Work for Special Tooling and Special Test equipment) as defined in a Boeing approved Purchase Contract. D33207-1 governs all newly funded line items, modifications, or repairs, including special tooling and special test equipment. The requirements outlined in D33207-1 apply to all newly fabricated ST/STE; however, these requirements are not retroactive and do not apply to existing assets fabricated prior to D950-11059-1 Revision G.

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.

The Seller is required to have a Boeing recognized QMS AS9100 approval in the SQ supplier data system when a Seller defines, fabricates, reworks, modifies, receives, uses, maintains, and/or stores a Boeing accountable asset in support of a Boeing Purchase Contract.

Seller including all Seller sub-divisions and subsidiaries under the same QMS certification must maintain documented information, processes, and training to implement and maintain the requirements of this document and all applicable referenced documents within.

Suppliers shall define training requirements to assure competence and shall maintain employee training records, including on-the-job training, for all applicable process performers.

Boeing reserves the right to conduct surveillance at Seller's facilities, including Seller sub-division facilities regardless of 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. Seller's recognized asset capabilities are documented and maintained in Boeing's Supplier Quality supplier data system.

Boeing accountable assets when 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, must obtain formal authorization. Assets not in use must be processed per Purchase Contract closeout requirements or formally submit request for excess asset disposition (Ref. E000 or statement of work).

If during Boeing Purchase Contract execution, the Seller or its subcontractors are not capable of performing the required asset function or capability, Seller must immediately and formally contact Boeing 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 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).

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 any applicable Boeing contractual requirements.

The Seller's sub-tier and subdivision asset capability determination, evaluation and approval are the responsibility of the Seller and must satisfy established QMS requirements for control of externally provided processes, products, and services and must be in compliance with requirements in this document.

The Seller must maintain and demonstrate to Boeing with objective evidence that the Seller's sub-tier and Seller subdivision approvals are acceptable with regard to applicable asset capability and compliance requirements.

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, a formal request will be directly submitted to Boeing Authorized Technical group in addition to Buyer's Authorized Procurement Agent (APA). When formal technical instructions are needed to satisfy contract and instructed by Buyer APA, Seller will submit using the Technical Supplier Information Request (TSIR) process.

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), authorized secured transmittal platform (e.g. Message Courier).

Suppliers shall notify their assigned Boeing Tooling Rep within 30 calendar days of implementing any changes to (Rep assignment found in SQ supplier data system):

A. Documented Tooling process as applicable to Boeing Asset Capability
B. Quality Manager and Key Personnel
C. Boeing Asset Capability/Categorization scope as defined in Table 1 and 2

1.5 Internal Audits

Internal Audit procedures shall include provisions for auditing all applicable operations annually affecting ST/STE and related documentation to assure continued compliance with contractual requirements.

A. The audit plan shall include provisions for auditing sub-tier suppliers that use and/or fabricate ST/STE to manufacture or inspect Boeing product.
B. The audit plan shall address all requirements of the latest revision of D950-11059-1 and D33207-1.
C. Results of all audits shall be documented and maintained for review by an authorized Boeing representative per contract requirements.

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, rework, modification, inspection, acceptance, and usage.

2.2 Requirements

A. Seller's capabilities to perform necessary elements of asset management throughout the life cycle of assets will be evaluated, approved 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. Design/Definition. (Section 4)
   2. Fabrication, Rework, or Modification. (Section 5, 6, 7)
   3. Conventional and digital measurement and physical coordination. (Section 5, 6, 7, 8)
   4. Visual and dimensional inspection. (Section 7, 8)
   5. User / Condition Check. (Section 9)

Table 1: Seller Approval Capability Level Requirements

Approval Capability Level	Design / Definition	Fabrication, Rework, or Modification	Inspection / Verification	User / Condition Check
Documented Information Required for Approval:				
Configuration Management (Ref. Section 3)	**X**	**X**	**X**	**X**
Design/Non-Design Definition (Ref. Section 4)	**X**			
Fabrication, Rework, and Modification (Ref. Section 5)		**X**	**X**	
Special Process (Ref. Section 6)		**X**	**X**	
Acceptance (Ref. Section 7)		**X**	**X**	**X**
Periodic Inspection (Ref. Section 8)			**X**	**X**
Each Use Condition Check (Ref. Section 9)		**X**	**X**	**X**
Manufacturing Work Instructions (Ref. Section 10)				**X**
Production Process Verification and Asset Relationship (Ref. Section 11)	**X**	**X**	**X**	**X**
Preventive Maintenance (Ref. Section 12)		**X**	**X**	**X**
Protection and Storage (Ref. Section 13)		**X**	**X**	**X**
Nonconforming Assets (Ref. Section 14)	**X**	**X**	**X**	**X**

Potential Product Impact (Ref. Section 15)	**X**	**X**	**X**	**X**
Receiving and Shipping (Ref. Section 16)		**X**	**X**	**X**
Records Requirements (Ref. Section 17)	**X**	**X**	**X**	**X**

How to read table

- Top row defines levels of approval and capability types. (note: Seller may be approved to one or multiple Discipline Categories)
- Left Column defines documented information required to meet a desired capability and approval type.
- Process documented information required "X"

C. Table 2 defines the special tooling categorization

Table 2 ST Category Description and Inspection Requirement Summary		
ST Category	Description	Periodic Inspection Requirement
CAT I	Program master tools, which typically include reference tools and tooling data that establish or control production ST.	Visual at each use, no special records required or as identified in ST definition.
CAT II	ST used in verifying product features or characteristics of parts or assemblies where designated ST is the only means being used for acceptance. Typically referred to as MOI.	Requires a periodic tool inspection that satisfies MOI type 1 physical dimensional inspection and/or Type 2 visual inspection. (See MOI types Section 8).
CAT II - MOI Type 1	End-item ST where tool degradation to the initial build can only be determined via physical measurement or master tool coordination and visual inspection (typically referred to as recycle, routine, or periodic tool inspections).	Physical measurement or coordination to a master tool (Category I), recorded on a prescribed inspection plan at a periodic interval.
CAT II - MOI Type 2	End-item ST where tool degradation to the initial build can be verified via visual inspection.	Visual inspection, recorded on a prescribed inspection plan at a periodic interval.
CAT III	ST not covered by Categories I and II.	Visual at each use, separate records not required (manufacturing work instructions establish the record).
All ST used to accept product or process must have evidence of acceptance prior to use. All Cat II ST must meet requirements of section 10.		

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/non-design definition, verification, validation, and acceptance
   2. Planning
   3. Identification and traceability
   4. Configuration Control/ Management

B. Seller must ensure that all assets are at the designated configuration level/revision 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 level/revision including asset engineering design/non-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 level/revision is integrated into the asset family to support the designated effectivity or incorporation point.

B. For Seller fabricated, reworked, and modified assets, the Seller must initiate actions to incorporate appropriate configuration level/revision into asset(s) at the appropriate effectivity or incorporation point. Seller must initiate coordination and negotiation with Boeing for proper configuration alignment.

3.3 Seller Asset Periodic Inspections and Asset Acceptance

A. Seller must ensure the correct configuration of all ST/STE, including multi-configuration ST/STE being used during the production 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 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.

4.0 Asset Design/Non-Design Definition

4.1 Scope

This section defines requirements associated with asset design (Boeing design format) or non-design (Seller design format) 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, fabrication instructions, and mylar type layouts.

4.2 Requirements

A. Seller must demonstrate asset design/definition system capability and proficiency (i.e., personnel, system capabilities, capacity) when asset design is in Boeing design format. Seller must be deemed capable in the Boeing SQ Supplier Data System for asset design/definition when required to support Boeing Purchase Contracts (not required for non-design/definition). Seller must maintain compliance and approval to sanctioned International Aerospace Quality Group (IAQG) AS/EN/JISQ QMS standards for Design and Development of Products and Services.

B. Sellers must maintain documented information to develop, control, revise, and/or maintain asset design/non-design 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 of use such as CAT I master tool use, product testing, product verification, etc. or otherwise identified by 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.

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. Seller owned assets are controlled by means of Purchase Contract provided Boeing-defined asset engineering design/definition.

B. 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 using data system (i.e., Supplier Data Requirements List (SDRL), Customer/Supplier Data Transmittal (CSDT), or the authorized secured transmittal platform (e.g. Message Courier) per contractual instructions for approval.

C. 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.

D. Seller must maintain Gated Tool Design Record (X35200-2) or Seller equivalent gated process documents as evidence of Boeing Design/Definition approval.

E. Assets that are not subject to Boeing approvals or gated reviews, and are not defined as described above, will be classified as non-design/definition assets. Boeing reserves the right to determine if asset design/definition approval is warranted during Purchase Contract execution regardless of asset type.

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 and D33207-1.
   1. Seller developed asset designs/definition must be traceable to the product engineering or specification criteria it was developed from.

C. All assets with designs/definitions that require stress analysis must bear evidence of a formal stress analysis completion, traceability, and acceptance by Boeing (Ref. D33011-23), unless otherwise specified by the Purchase Contract.

D. When required by Purchase Contract 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 and must be submitted in accordance with D33207-1 ST/STE-001:
   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.

5.0 Fabrication, Rework, and Modification

5.1 Scope

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

5.2 Requirements

A. Seller must be deemed capable in the Boeing SQ Supplier Data System 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
   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.
   1. When program specific forms are required per Purchase Contract, Seller must contact Boeing 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 initial fabrication, rework and modification records (i.e., work authorization, inspection records, build log documents, electronic records format), will be maintained per Seller QMS and Section 17.0.

5.3 Initial Fabrication, Rework and Modification

A. All assets must be initially fabricated, reworked, or modified as defined per Purchase Contract 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 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 14 and addressed in accordance with Seller's QMS process, including Boeing notification.

5.4 Asset Identification

A. Asset identification must meet Purchase Contract.

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)
   2. Special Test 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.

5.5 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 14 Nonconformance).
   2. Boeing Material Substitution Drawing/Specification/List (i.e., D33181-105 Tool Fabrication and/or Rework without Drawing Coverage).

5.6 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 (l), 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 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.

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.

5.7 Asset Usage Instructions

A. Asset usage instructions include technical and process related information for asset users. They are typically provided when assets are 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 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.
      b. Seller requested asset usage instruction changes must be submitted 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 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.

5.8 Master Coordination

A. As defined in Boeing Purchase Contract use of CAT I master tools is mandatory. Where physical or digital CAT I master tools control asset features (interface, interchangeability, etc.) is required, the CAT I master tool is the control authority regardless of design/definition values.

B. Usage and coordination criteria of 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. 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 (l), unless otherwise specified and per section 5.6 A1 (Coordinate Measuring Systems (CMS) measurements).

D. The Seller must ensure all CAT I master tools are independently coordinated to any asset where dimensional coordination integrity must be maintained. 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.).

E. Unless otherwise contractually authorized the Seller must ensure 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 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 CAT I master tool during possession or use. Any issues identified by Seller involving a CAT I master tool (i.e., configuration alignment, dimensional error, damage, usage instructions,) must be formally documented per section 14 communicated to Boeing and/or documented per contractual requirements and Seller's QMS.

H. The Seller must not use digital transfer of CAT I master tool coordination features where a physical master is required. Seller must not deviate from CAT I master tooling coordination as defined in design/definition requirements. Any digital master process must satisfy section 5.8 I & J.

I. Sellers may request digital mapping/measurement of CAT I master tools. Seller must formally request technical authorization (Ref. X30613 or Seller equivalent form) to digitally map/measure a CAT I master tool and obtain technical and contractual approval to proceed.

J. Boeing contractually provided or as identified on asset design/definition, approved replacement of physical 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.

6.0 Special Processes

6.1 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.

6.2 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 processes.
   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 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 QMS and section 17.0.

7.0 Acceptance

7.1 Scope

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

7.2 Requirements

A. Seller must demonstrate asset acceptance process capability and proficiency (i.e., personnel, system capabilities, capacity). Seller must be deemed capable in the Boeing SQ Supplier Data System (Ref. section 2.0 Seller Asset Capability) for asset inspection, verification, and validation when required to support Boeing Purchase Contracts.

B. Sellers must meet the requirements of D6-51991 (Quality Assurance Standard for Digital Product Definition at Boeing Sellers) for use of Coordinate Measurement Systems (CMS) for any asset acceptance.

   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. Seller must contact Boeing 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 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. 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 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 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 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 provided as required per D33207-1 ST/STE–002 requirements. Seller must formally notify Boeing of all issues involving development, submittal and retention of asset acceptance records.

I. Boeing reserves the right to verify asset setup and asset acceptance including CAT I master coordination per section 5.6. When Boeing verification of asset is identified to support Boeing Purchase Contracts, Seller must contact Boeing to coordinate Boeing attendance.

J. When Boeing asset acceptance is required by Boeing Purchase Contract, Seller must notify Boeing or process request within SQ Supplier Data System when Seller is ready for Boeing asset acceptance. Seller must only complete asset acceptance requirement per section 7.2 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 the asset by permanent means such as impression stamping, chemical or mechanical etch, laser or machine engraving, etc.
2. A documented alternate method when asset size, usage and environment does not permit physical evidence marking (e.g., identification tags, unique identifier – color, marking, etc.).
3. As defined per Boeing contractual instructions.

7.3 Asset Acceptance Methods

A. Seller must apply one of the following asset acceptance types for first production:

Minor Validation/Verification: The most common process. Occurs when manufacturing uses a new, reworked or modified asset for the first time as defined in manufacturing work instructions (shop traveler, etc.). Typically applied to low-risk ST of basic to moderate complexity and may or may not control product configuration.

Assets that do not control product configuration may be unconditionally released upon completion of fabrication and acceptance to asset design/definition.

When the asset controls product configuration, the asset is conditionally released, and the initial product of the asset is independently inspected to validate the tool produces acceptable product. During first production run, manufacturing work instructions must define independent product verification method and sequence to determine asset acceptance status. Successful

completion of asset minor validation/verification allows asset acceptance to be unconditionally released for production use. Should asset users encounter issues or nonconforming conditions, the Seller's documented asset support process applies.

1. **Major Validation/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. After successful completion of asset Major Validation/Verification – Product Fabrication the asset is unconditionally released for production use.

2. **Major Validation/Verification - Assembly**: Process typically applied to complex assets, including MOI. All assets are initially fabricated, reworked and modified to design/definition requirements, including 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). Validation/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 8 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 Validation/Verification - Assembly allows asset acceptance to be 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 to obtain technical instructions for resolution.

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 is typically 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. CAT I master tools are rigged/indexed/coordinated in an independent unrestrained condition during any fabrication or acceptance process per section 5.

7.4 Proof Load / Pressure Test

A. When required by Boeing Purchase Contract, that Proof Load / Pressure Test must be completed, documented, and accepted by the Seller or Seller's approved subcontractor per section 1.3.

B. Boeing reserves the right to witness the proof load / pressure test. When required, Seller must notify Boeing 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 / pressure 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, pressure gauges, etc.) when performing proof load testing.

E. Seller must affix or provide any required proof load / pressure test labels or tags when required by Purchase Contract, design/definition or specification.

F. When Seller is contractually delegated proof load / pressure test activity, Seller must perform proof load / pressure test per design/definition and document results per section 7.2 D and E.

G. The Seller must develop a separate proof load / pressure test certificate for each asset requiring proof load / pressure testing. Each Proof load / Pressure test certification must be traceable to Purchase Contract, asset, asset design/definition, and asset configuration. Proof load / Pressure test results and certification must be processed per section 17.

H. Seller must contact Boeing for technical instructions when proof load / pressure 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.

8.0 Periodic Inspection

8.1 Scope

This section covers all Government- and Boeing-owned CAT II Assets used to produce Government and Boeing products

8.2 Requirements

A. Seller must demonstrate periodic inspection process and system capability and proficiency (i.e., personnel, system capabilities, capacity). Seller must be granted capability for asset periodic inspection when required to support Boeing Purchase Contracts.

B. When required by Boeing Purchase Contract, asset design/non-design definition or any asset used as control media or for product acceptance are subject to periodic inspections. All periodic inspection actions will be accomplished as defined below.

C. Any asset being deemed MOI by Seller or Boeing requires periodic inspections in addition to each use condition checks. Asset types subject to Periodic Inspection include but are not limited to the following:

1. Special Tooling (ST) – CAT II
2. Special Test Equipment (STE)
3. Any asset deemed configuration critical by Boeing

D. There are two specifically defined types of asset periodic inspections. Type 1 and Type 2 for MOI.

1. Type 1: Physical dimensional measurement and/or coordination to a CAT I master tool (physical or digital) including visual inspection that must be documented on a prescribed PIP at a periodic interval or frequency.
2. Type 2: Visual inspection must be controlled by documented information or on a prescribed 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 MOI, including any asset provided to a subcontractor.:

F. When Seller has demonstrated capability to Boeing to perform periodic inspections, the following requirements must apply:

1. Seller may determine asset for use as MOI (i.e., CAT III special tools). Seller's process for asset product acceptance determination must meet the following conditions:

a. Must have Boeing Engineering / Tool Quality approval prior to being used as MOI.

b. Seller retains/maintains asset engineering design/definition.

c. Seller retains Product engineering definition to determine independent product verification.

2. For Seller's initial asset determination all assets as MOI must meet asset acceptance requirements per section 7.2 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 PIP must be implemented based upon product engineering and asset complexity.

G. 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 prior to implementation.

H. 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.

I. 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.

J. 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 prior to Periodic Inspection expiration. Sellers must provide extension justification and estimated Periodic Inspection performance/completion date.

K. Any asset that exceeds Periodic Inspection frequency date, including customer rejection of asset Periodic Inspection extension, must be documented per section 14, section 15 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 14.2 H&I.

L. 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.

M. Seller must provide the results per ST-004 data item deliverables found in D33207-1 and maintain the results of preceding and current periodic inspection of assets. Periodic Inspection results must be controlled per section 17.

N. 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, inactive)

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. For assets (stored, inactive, etc.) under periodic inspection extension status, assets must satisfy completed Periodic Inspection (Type 1 or Type 2) prior to next usage.

8.3 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. The use of approved text and graphics to enhance the PIP content and usage is encouraged
   4. Be maintained under configuration controls.
   5. Be approved and released.

B. Periodic Inspection instructions are typically developed and used for Special Tooling Type 1 and Type 2; Special Test Equipment.
   1. Seller-defined
      a. Seller-defined asset PIP for all CAT II Type 1 periodic inspection instructions must be submitted to Boeing for technical approval. This includes any Boeing-defined PIP revised or changed by Seller.
      b. Seller must maintain configuration alignment of all Periodic Inspection Plans to design/definition.
   2. Boeing-defined
      a. Seller requested changes to Boeing-defined PIP must be submitted to Boeing for technical approval (i.e., configuration alignment, inspection instructions, or frequency).
      b. For Boeing provided assets identified as MOI of product where no Periodic Inspection Plan is provided Seller must notify Boeing for technical instructions to receive or develop Periodic Inspection Plans.

C. Periodic Inspection instructions must include:

1. Type 1 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. Instructions must include all critical tolerance ranges and Geometric Dimensioning and Tolerancing (GD&T) features.
    a. Where CAT I master tools (digital or physical) are asset authority and are required as part of Periodic Inspection instructions to verify asset section 5.6 applies.
2. Type 2 visual inspection – defined features and all elements per section 10.

D. The format and content listed in D33207-1 ST-003 must be included as part of Asset Periodic Inspection Plan.

E. Any discrepancies identified during asset Periodic Inspection must be properly documented per Seller's QMS as defined per section 14 including Boeing notification.

9.0 Each Use Condition Check

9.1 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.

9.2 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. Typical areas of consideration during Each Use Condition Check include, but are not limited to the following:
   1. Assets are 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.

D. All Users and/or asset coordinators must ensure assets function correctly and are properly maintained per section 12.0.

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 QMS including asset maintenance process.

10.0 Manufacturing Work Instructions

10.1 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.

10.2 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, asset usage instructions, or asset configuration alignment Ref. section 1.2, Seller is required to follow its QMS for nonconformance reporting and coordinate with Boeing to obtain technical instructions for resolution.

11.0 Production Process Verification and Asset Relationship

11.1 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.

11.2 Requirements

A. All assets used during the performance of Production Process Verification activities must show evidence of acceptance status prior to use.

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/non-design definition changes potentially affecting fit, form or function occur.
   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.

C. Asset related events that do not invoke re-accomplishment of Product Process Verification include the following:
   1. Asset Preventive Maintenance per section 12 (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.).

11.3 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.

12.0 Preventive Maintenance

12.1 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 required.

12.2 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 preformed 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 QMS to address assets with excessive wear, damage or no longer in a serviceable condition. This may include Boeing notifications, nonconformance reporting, work authorization.

F. Unless otherwise specified in the Purchase Contract, 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 and Seller.

G. Any asset discrepancies found during preventive maintenance activity must be properly documented and addressed in accordance with Seller's QMS.

H. Seller must immediately and formally submit technical requests to Boeing for resolution when normal wear or nonconformance conditions exceed Seller capability for correction.

I. Seller must, in a timely manner, disclose and formally submit technical requests to Boeing when asset approaches end of useful life to ensure resolution is addressed before Potential Product Impact or deliveries occur.

J. Any assets that have been subjected to a natural or man-made incident such as:

1. A natural disaster (earthquake, hurricane/cyclone, flood, tornado, etc.).
2. 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, re-accomplishment of Periodic Inspection or verification to design/definition requirements depending upon severity of the incident. Seller should contact Boeing for guidance when necessary.

12.3 User Maintenance

A. The basic elements of asset user maintenance are Each Use Condition Checks and Periodic Inspections.

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. 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 QMS.

12.4 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 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.
   7. Purchase Contract maintenance instructions when applicable.

C. Typically required for any assets with special systems, load bearing equipment (static or overhead) or assets subjected to sustained usage.

D. There are two levels of Planned Preventive Maintenance events performed by qualified personnel.
   1. 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.
   2. 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.

E. Records of current and previous asset Preventive Maintenance events must be maintained per section 17.

13.0 Protection and Storage

13.1 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.

13.2 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. Seller must not expose Category I Master Tool or Master Tools containers to the outside environment

C. Assets (in use or not in use) 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.

D. 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.

13.3 Assets Not in Use

A. Seller's storage requirements must include periodic preservation / condition checks for all assets in storage.

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). Seller must, in a timely manner, formally notify Boeing per Purchase Contract (Ref. E000 Supplier Requirements for Buyer/Government/Customer Property Management) 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.)

14.0 Nonconformance

14.1 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 of any actions necessary to resolve nonconforming assets.

14.2 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 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. Nonconforming conditions will be processed per Purchase Contract and/or Seller's nonconformance process up to and including potential product impact investigation per section 15.2.

All nonconformance documented information must be submitted to Boeing to obtain approved disposition and maintained per section 17.

C. Boeing does not delegate Material Review Authority to Seller's.

D. All CAT I master tools identified with nonconforming condition(s) must immediately be documented per Purchase Contract and formally submitted to obtain Boeing approved disposition.
    1. A discrepant CAT I master tool must not be used until Boeing has provided technical and/or contractual instructions received in writing.

E. All nonconformance conditions of CAT II and III ST must be addressed at the level of Seller capability. All CAT II ST nonconformance dispositions must be retained by Seller and made available to Boeing upon request.

F. Unless otherwise specified in Purchase Contract, a nonconformance document that is submitted for disposition will include all of the details found in ST-005 or STE-003 located in D33207-1.

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, and documented, the alternate manufacturing method plans must be submitted to Boeing 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 CAT I master tooling, as applicable. a. Any CAT I master tools /gages determined to be deficient must be brought to the attention of Boeing immediately per section 14.2 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, etc.
   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. Seller must coordinate with Boeing 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.

15.0 Potential Product Impact

15.1 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.

15.2 Requirements

A. Asset discrepancies potentially impacting products must invoke a Potential Product Impact (PPI) investigation as defined by Seller's QMS (i.e., Improvement, Nonconformity, and/or Corrective Action process).

B. Seller must notify Boeing upon initiation of PPI investigations where a potential product escape has occurred and make investigation results available to Boeing upon request.

C. Asset nonconformance types requiring further investigation for Potential Product Impact 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, subassemblies, 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.

D. 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 QMS acceptance processes up to and including initiation of nonconforming product documentation.

E. 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 QMS. Submit formal notifications to Boeing per contractual instructions.

   This activity/process must include products at Seller's and its subcontractors' facilities, and products previously delivered to Boeing.

16.0 Receiving and Shipping

16.1 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 and Government owned Boeing accountable assets.

16.2 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 assets per section 13. 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 for any asset receiving or shipping related questions.

B. 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.

C. Any discrepancies found during receiving or shipping actions, including asset screening, must be properly documented and addressed in accordance with Seller's QMS and section 14.

D. All assets will be incorporated into Seller's asset control processes for accountability, use and storage. Retaining photographs of asset condition at time of receipt is encouraged.

16.3 Asset Screening

A. Upon receipt and shipment 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 and shipment if no design/definition, Original Equipment Manual (OEM) and/or associated documents are provided, immediately notify Boeing 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 17.

B. 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 (impression stamping, chemical or mechanical etch, or unique identifier).

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.
5. Verify received asset configuration) aligns to the asset design/definition.
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 1.4.

16.4 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).

B. Seller must maintain documented information that defines asset shipping processes that include 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.
   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.
   5. Screening - Shipment screening must include verification of deliverable records package is complete per section 17.
   6. Non-Conformance - No asset with an open nonconformance record will be shipped without formal shipping authorization from Boeing.

C. Unless otherwise specified in Purchase Contract, the following records must be provided as part of asset shipment when:
   1. Seller has executed any Purchase Contract that procures design/non-design definition, initial fabrication, rework or modification and delivery of an asset. Records must include the following: a. Certificate of Conformance
   i Design/non-design definition
   ii Data Elements (usage instruction, manuals, plans, data, etc.) when applicable.

iii Proof Load Test Certification (when applicable)
iv Special Process Certification (when applicable)
v Inspection/acceptance Records, including build logs & digital measurement records when required.
vi Screening Record.
vii Nonconformance Records (disposition complete /closed)
viii Photograph(s) of asset condition as part of delivery package is encouraged.

D. Seller must formally notify Boeing for any shipping related issues or questions to obtain contractual instructions to proceed.

16.5 CAT I Master Tool

A. When receiving CAT I Master tool with dedicated Master container (Sealed), Seller must contact Boeing 5 days prior to opening. 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.

B. When opening 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.
4. Perform asset screening per 16.3 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.

E. Shipment of CAT I Master tool from the Seller’s facility, including to Seller’s alternate locations or a subcontractor requires formal authorization from Boeing and must not be shipped until written authorization is received.

F. Boeing reserves the right to verify 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 5 days prior to coordinate attendance.

G. Seller must ensure CAT I Master tool shipping containers are free from damage and in a serviceable condition. Master tool containers must prevent environmental or physical damage and allow for safe transportation of master tools.
1. Seller must formally notify Boeing 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.

H. 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.
5. Complete all sections of the Open/Close Log (Ref. X22220 form).
6. Typically completed while performing a preparation / screening event.
7. Ensure open/close log and master tool design/definition, including when appropriate Configuration Record form is inside container prior to sealing.

I. At each 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).

17.0 Records Requirements

17.1 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.

17.2 Requirements

A. Record retention shall be defined in Seller's QMS. Defined retention periods and dispositions, including digital archive, typically asset life or as defined by Purchase Contract. 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.

B. Seller must define a process on how to submit formal supplier data according to the tooling SDRL submittal schedules as defined in D33207-1 section 1.14. See Table 4 for the delivery schedule and requirements.

C. Seller must retain documented information (Records) to ensure processes were carried out as planned. Records must be controlled and made available upon request these 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. Screening Records
9. Periodic Inspection Plans (PIP)
10. Periodic Inspection Records / Results
11. Preventive Maintenance Plans (PMP)
12. Periodic Maintenance Records / Results
13. Certificate of Conformance
14. Proof Load Test Records (Certification)
15. Asset Completion Records, including invoices, property list, and/or property records submitted in Boeing's electronic data system.
16. Seller processing an asset as a user closeout and/or return to Boeing, including a Boeing or government storage facility, relocating asset to alternate location or relocating asset due to Purchase Contract completion or termination, records must include the following:
    a. Design/non-design definition (when applicable)
    b. Data elements (usage instruction, manuals, plans, data, etc.) (when applicable)
    c. Proof Load Test Certification (when applicable)
    d. Inspection/acceptance records, including build logs & digital measurement records (when applicable)
    e. Screening records
    f. Periodic inspection records (when applicable)
    g. Periodic maintenance records (when applicable)
    h. Nonconformance records (disposition complete /closed) (when applicable)
    i. Photograph(s) of asset condition as part of delivery package is encouraged.

17.3 Records

A. Unless otherwise defined per Purchase Contract, 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.
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 lifetime 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 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)
    i. Pre/Post Visual and non-destructive examination reports (when applicable)
3. Inspection/acceptance records 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 section 6.2 Control of Measurement Equipment.

4. Special Process Records will include evidence that all material and special process specifications 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 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., lifetime 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, in support of assets
   Initial Fabrication, Rework, or Modification and Asset Acceptance. 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 as an example), at a minimum this documented information 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., lifetime 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 section 6.2).
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 to obtain instructions and any requested forms.

7. Seller must maintain Periodic Inspection Plans (PIP) and Periodic Inspection results as part of records retention. 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 owned Boeing accountable assets, all periodic inspection results per section 8 must be sent to Boeing within 30 days of completion.
   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 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 8 including CAT II listing, recall dates, Subcontractor results, etc.

8. Seller must maintain Preventive Maintenance Plans (PMP) and 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 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 and/or Boeing's electronic data system when required.
10. Seller must maintain Screening records 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, CAT I master shipping, customer witness, etc.).
    d. Screening actions per section 16.3, acceptance and rejection status.
    e. Traceability to any Nonconformance condition identified during Screening event.
    f. Traceability of inspection / acceptance authority of the individual performing screening event.

18.0 Definitions of General Terms

Adjustable Datum: 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) and Special Test Equipment (STE).

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 or 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 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 until contract closeout.

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 are 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 – Designed: The 3D and/or 2D elements, annotations and dimensions which meet the complete set of requirements and standards to configure a physical tool. Data set designed by equipment and/or tooling engineers that represents the physical and

functional requirements, features and characteristics of a production tool. These data sets include graphical, digital and textual representations that aid in the analysis, manufacture, test, and inspection of Boeing production tools.

Design/Definition - Non-Designed: A non-complex tool manufactured to a work authorization that contains detailed fabrication instructions and materials. Does not require a formal Tool Drawing or stress analysis or other engineering analysis. Sketches necessary for fabrication may be used to aid tool manufacturing.

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.

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 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 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 are 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.

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 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.

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 Owned Assets that are Accountable to the Boeing Company: Seller-owned assets that are accountable and managed by the Boeing Company which maintains design authority and configuration management, including assets developed using Boeing-provided asset engineering design.

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.

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.)

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

19.0 References

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

AS9102, “Aerospace First Article Inspection Requirement”

D32028-1, “General Requirements for Tooling Welding”

D33011-23, “Stress Analysis for Engineering”

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

D33181-40, “Tool Identification”

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

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

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”

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

X30613, “Gageless Tooling Conversion Request”

X35200-2, “Gated Tool Design Record”

Exhibit A
Example Asset Screening Record

Supplier Name & Address:	Hawks Aviation LLC (HAL) 12345 Aero Ave. Everett, Wa. 98201			
Tool Number	**Rev.**	**Screening Event**	**Shipper #**	**P.O. / Order #**
FAJXXXXXXX-XXX	New	Receiving ☐ Shipping ☐	ZYX321	1234567

Design / Definition Used	NCR Issued	NCR / CA #	Customer Notification / Shipping Authorization Required
Yes ☐ No ☐	Yes ☐ No ☐		Yes ☐ No ☐

		Accept	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 serviceable 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 / ensure assets and details are securely packaged to prevent damage during shipping.		
	Category I (Master control tools, Master Gages, Etc.) Including 1-7		
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.		

Comments:	**Date**	
	Acceptance	

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 *January 21, 2019*

John Q Fab HAL Quality Manager Date

Appendix A

Production Equipment and Special Tooling Quality Standard Document Map		
	AS9100 D	AS9102 C
Introduction and General Requirements	7.2 8.4 7.3 8.4.1 7.5.1 8.4.2 8.2.1	
Seller Asset Capability	7.2 8.4 7.3	
Configuration Management	8.1.2 8.2.1	
Asset Design/Non-Design Definition	8.2.1 8.3.6 8.3	
Fabrication, Rework, and Modification	8.1 8.5.5 8.2.1 8.5.1 8.5	
Special Processes	8.4 8.5.1 8.4.2	
Acceptance	7.1.5 8.5.1.1 7.1.5.1 7.1.5.2	
Periodic Inspection	8.2.1 8.7 8.5.1.1 7.1.5.1 7.1.5 7.1.5.2	
Each Use Condition Check	8.5.1.1 8.7	
Manufacturing Work Instructions	8.1 8.5.5 8.2.1 8.5.1	
Production Process Verification and Asset Relationship	8.2.1 8.6 8.5.1.3 8.5.1.1	4.1 4.4 4.2 4.7.3
Preventive Maintenance	8.1 8.7 8.2.1 8.5.1.1	
Protection and Storage	8.5.1.1 8.7 8.5.4	
Nonconformance	8.2.1 8.7	
Potential Product Impact	8.2.1 10.2 8.7	
Receiving and Shipping	8.2.1 8.7 8.2.2 8.6 8.4.3 8.5.4	
Records Requirements	8.4.3 10.2 8.5.1 9.1.1 8.5.1.2 8.7.2 8.5.1.3 8.6 8.5.2 8.5.6 8.5.3	

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 (Org. Number)	Sept 17, 2009 (Date)
APPROVAL:	Thomas J. Spiegel	D500 (Org. Number)	Sept 17, 2009 (Date)
DOCUMENT RELEASE:	Ngoc H. Bui	G-823A (Org. Number)	Sept. 23, 2009 (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

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

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

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

.

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

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

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 requir	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

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

AUTHOR:	Greg W. Schmid	HM-01-D78A	June 13, 2016
		Org. Number	Date
APPROVAL:	Timothy R. Ditch	HM-01-D78A	June 13, 2016
REVIEWER:	Lucia Casillas	66-CJ-MP6Q	June 16, 2016
		Org. Number	Date
DOCUMENT RELEASE:	Alicia E. Otero	9M-ST-EUA0	June 21, 2016
		Org. Number	Date

Revision Letter	G
Changes in This Revision	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).
Authorization for Release	

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	Organization Number	Date
DOCUMENT RELEASE:	Heather J. Kinney	3315235
	Name	BEMSID
	9M-ST-EUA0	May 14, 2021
	Organization Number	Date

Rev	Section	Change	Rationale
H	Title	Revised Title to reflect all the assets that are applicable to these requirements	Clarification of scope
	Table of Contents	Revised page numbers and adjusted section references.	Formatting
	Section 1.1	Removed reference to Seller owned accountable to Boeing assets: Removed explicit call out of Overhead Mechanical Equipment; Added the term Non-Design to align with D33207-1	Clarification of requirements
	Section 1.2	Removed D33200-1 references from documents; added training requirements; revised AS9100 QMS approval requirement; moved internal audits to its own section (1.5); removed D33113-1; removed E000 requirements; removed the reference section titles throughout document.	Clarification of requirements
	Section 1.3	Removed acknowledgement of a sub contactor capability as an option.	Clarification of requirements
	Section 1.4	Removed Integrated Data Management System and Vendor Inventory Process.	Clarification of requirements
	Section 1.5	Added section for Internal Audits.	Clarification of requirements
	Section 2.0	Added table 2 ST Category Description and Inspection Requirement Summary; removed Table 2 Seller Asset Approval Type / Documented Information Requirements	Clarification of requirements
	Section 4.1	Added definition regarding what is design vs non-design.	Clarification
	Section 4.2	Added Boeing SQ Supplier Data System for granted capability; removed additional description of what is design/definition	Clarification
	Section 4.3	Removed “configuration critical” related definition; removed Integrated Data Management System.	Clarification
	Section 4.4	Added D33207-1; removed design requirements that are listed in D33207-1.	Clarification
	Section 5	Removed section 5 and incorporated into applicable section.	Clarification
	Section 5.4	Added Asset Identification section replacing previous section 5.	Clarification
	Section 5.7	Added Asset Usage Instructions section replacing previous section 5.	Clarification
	Section 6	Renamed to Special Processes due to removal of section 5.	Formatting
	Section 7.	Renamed to Acceptance section	Formatting
	Section 7.2	Added reference to D33207-1 and clarification to the SQ Supplier Data System.	Clarification

Rev	Section	Change	Rationale
H	Section 7.3	Added Validation to clarify acceptance terminology; Rewritten section to clarify minor acceptance and communicate conditional release of assets which control product configuration	Clarification
	Section 7.4	Added Pressure Test to accommodate various STE applications	Clarification
	Section 8	Renamed to Periodic Inspection	Formatting
	Section 8.1	Removed D33200-1 language	Clarification
	Section 8.2	Maintaining list of assets now states any asset used as MOI will be identified and maintained on a recall process/system; Clarified assets that will be used as MOI will have Boeing Engineering approval prior to use as MOI; added pointer to ST-004 for delivery of Periodic Inspection Data	Clarification
	Section 8.3	Removed D33200-1 references; added pointer to D33207-1 ST-003 delivery of Periodic Inspection Plan Data	Clarification
	Section 9.0	Renamed section Each Use Condition Check	Formatting
	Section 10	Renamed to Manufacturing Work Instructions	Formatting
	Section 11	Renamed section to Production Process Verification and Asset Relationship	Formatting
	Section 12	Renamed to Preventative Maintenance	Formatting
	Section 12.4	Moved definitions to glossary; removed list of types of assets that have preventative maintenance plans as all are required to have a plan	Clarification
	Section 13	Renamed to Protection and Storage	Formatting
	Section 13.3	Removed Assets in Use; removed Storage and Protection Requirements section and added reference to E000	Clarification
	Section 14	Renamed section to Nonconformance	Formatting
	Section 14.2	Added submission and Boeing approval for disposition; removed D33200-1 BCA language; added pointer to D33207-1 ST-005 and STE-003 for nonconformance data deliverables.	Clarification
	Section 15	Renamed to Potential Product Impact	Formatting

Rev	Section	Change	Rationale
H	Section 16	Renamed Receiving and Shipping	Formatting
	Section 16.2	Removed list of types of assets	Clarification
	Section 16.3	Added section to define screening requirements for shipping and receiving	Clarification
	Section 16.5	Consolidated all requirements for Master Tool in this section	Clarification
	Section 17	Renamed section to Records Requirements	Formatting
	Section 17.2	Referenced D33207-1 deliverable requirements and SDRL schedules; removed formatting examples	Clarification
	Section 18	Removed Post-production and Spares section and shifted section 18 to Definitions of General Terms	Formatting
	Section 19	Renamed to References; removed references to D33200-1 and site-specific documents.	Formatting
	Appendix A	Removed deleted sections and updated AS9102 C reference	Clarification

Revision Letter H

Changes in This Revision See above summary in table

Authorization for Release

AUTHOR:	Shawn Sweeney	3445438
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	HM-01-D77A	May 13, 2026
	Organization Number	Date
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	HM-01-D77A	May 13, 2026
	Organization Number	Date
DOCUMENT RELEASE:	Cynthia Jacobs-Butler	1382303
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	9M-ST-FUA0	May 29, 2026
	Organization Number	Date