

**LS-SBU-A001-SQA**

**LS Supplier and Product Quality Requirements**

<b>Approval:</b> Dean Hansen – Supplier Quality Assurance	<b>Signature:</b> (signature on file)
<b>Approval:</b> Rob Skrobak – Supply Management	(signature on file)
<b>Approval:</b> Keith Williamson – Materials and Process Technology	(signature on file)
<b>Approval:</b> Scott Riemer – Quality Management	(signature on file)



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## 1. Overview

### 1.1. Purpose:

- 1.1.1. This document is a supplement to UTC Supplier Quality System Requirements, ASQR-01 and **COL-ASQR-PRO-0003** (formerly UTAS-SCM-PRO-0003) for Collins Aerospace Landing Systems (LS).
- 1.1.2. This document defines Landing System quality requirements for tier 1 (*LS purchasing document recipient*), *sub-tier suppliers and processors (recipient of purchasing document from tier suppliers associated with LS purchasing document)* and applies to all purchased product by and for all Landing System sites when referenced by purchase order or contract.
  - 1.1.2.1. **Wheels and Brakes specific requirements herein are identified (\*WB) and Landing Gear specific requirements herein are identified (\*LG).**

### 1.2. Scope:

- 1.2.1. Applies to all LS suppliers and processors when ASQR-01, **COL-ASQR-PRO-0003**, and LS addendum requirement LS-SBU-A001-SQA, is invoked by direct reference on the purchase order.
- 1.2.2. No deviations from these requirements are permitted unless specifically authorized in writing by LS Supplier Quality Assurance management.

### 1.3. Responsibility:

- 1.3.1. LS Supplier Quality Assurance in collaboration with Supply Chain Management is responsible for the management and administration of the requirements contained within this document.
- 1.3.2. Suppliers are responsible for ensuring the use of LS and customer-directed supply/process resources.
- 1.3.3. Suppliers are responsible for ensuring the capability of all offload sub-tiers and the quality of all product and services provided.
- 1.3.4. Suppliers and Processors are responsible for contacting your Supply Chain Management or Supplier Quality Representative(s) for questions or clarification
- 1.3.5. Right of access - Supplier shall notify LS Procurement for coordination of activities if contacted directly by LS customers or regulatory agencies.

### 1.4. Document Links:

- 1.4.1. LS has provided a document retrieval site within each supplier's **Content Server** account, it is the responsibility of each supplier to ensure they have access and comply to the current revision of these documents and flow down the specific requirements including Collins Aerospace, LS, and customer requirements to their respective sub-tiers and processors.
- 1.4.2. Additional access to the standard flow down documents are as follows:

<https://utcaerospacesystems.com/supplier-documents/>

For **COL-ASQR-PRO-0003**, LS-SBU-A001-SQA, Doc 200, UTC Terms & Conditions Addendum

<http://www.utc.com/Suppliers/Pages/Aerospace-Supplier-Quality-Requirement-Documents.aspx>

For ASQR-01 referenced documents and related forms

### 1.5. Quality Alerts – **see ASQR-01 and/or COL-ASQR-PRO-0003**

### 1.6. Engineering Data:

- 1.6.1. Parts shall be manufactured/processed to the latest process specification revisions in effect at the time of commencement of the manufacture/processing.

- 1.6.2. Suppliers are responsible for ensuring they have the current and or latest drawing and specification requirements per current purchase order(s) requirements.
- 1.6.3. Use of an older revision drawing or specification is not acceptable unless authorized by LS Engineering. Written authorization is required prior to any performance of the older version requirements.
- 1.7. Engineering Change Proposal Requests (ECPRs)
  - 1.7.1. Suppliers may request an engineering change by completing an Engineering Change Proposal Request (ECPR), form [LS-LG-F-014-ENG](#)
    - 1.7.1.1. Completed forms shall be submitted through Content Server. The LS buyer shall be the focal for status/updates.
    - 1.7.1.2. The ECPR shall be properly completed including the reason or the justification for the ECPR. An incomplete ECPR will be returned to the originator for resubmission.
    - 1.7.1.3. The results of a LS review of the request will be forwarded to the supplier.
- 1.8. Quality Record Retention: (LS specific requirements)
  - 1.8.1. Quality records are to be maintained for no less than **10** years past the end of the program.
  - 1.8.2. Supplier Quality Assurance is to be notified in writing at least 2 months prior to planned destruction of records pertaining to product supplied to LS. Recorded shall not be destroyed unless notified in writing by LS SQA.
- 1.9. ITAR and EAR compliance:
  - 1.9.1. Suppliers, Processors and their sub-tiers shall ensure compliance to ITAR and EAR requirements when handling LS parts and documentation. Any US supplier manufacturing or handling ITAR products must be DDTC (Directorate of Defense Trade Controls) registered. Any Canadian Supplier manufacturing or handling ITAR products must be CGD (Controlled Goods Directorate) registered.
  - 1.9.2. If a non-US supplier is using a US sub-tier supplier for ITAR work, that US supplier must be DDTC registered. The US supplier must also have authorization (i.e. ITAR exemption, license to export the ITAR product back to the non-US supplier)."
  - 1.9.3. Technical and/or proprietary information for all programs shall be transferred between LS and outside sources through the 2 following methods only:
    - 1.9.3.1. Content Server for the following technical and/or proprietary information: or as applicable documents
      - 1.9.3.1.1 LS supplied specifications
      - 1.9.3.1.2 Technical data such as Models, Drawings, ECNs, and parts lists
      - 1.9.3.1.3 First Article Inspection Reports for 2D drawing and MBD (3-D Modeling)
      - 1.9.3.1.4 Alteration or repair of LS or LS customer tooling / gages / fixtures
      - 1.9.3.1.5 LS Failure Analysis Report (FAR)
      - 1.9.3.1.6 Supplier Corrective Action Requests (SCARs)
      - 1.9.3.1.7 LS Approved Processor List (Doc 200)
      - 1.9.3.1.8 Engineering Coordination Memo's
      - 1.9.3.1.9 Quality Notification (QN)
      - 1.9.3.1.10 Manufacturing Plans
      - 1.9.3.1.11 Technique Sheets
      - 1.9.3.1.12 Control Plans/ FMEAs
      - 1.9.3.1.13 Engineering Change Proposal Request (ECPR)

- 1.9.3.2. Encrypted WinZip (current LS authorized version) email for the following information:
  - 1.9.3.2.1 Disclosures
  - 1.9.3.2.2 Service and Warranty Information
- 1.9.4. File size of submitted information needs to be less than 4 megabyte; Larger files will need to be proportioned accordingly.

#### 1.10. Material Substitutions

- 1.10.1. Material substitutions are **not allowed** unless authorized by engineering drawing / model, material specification, LS MRB disposition or superseding of a material specification. This applies to (and is not limited to):
  - 1.10.1.1. Material grade (or stock such as bar, rod, tube, extrusion, and flat)
  - 1.10.1.2. Material Condition (i.e. heat treat)

## 2. Manufacturing Record Control

### 2.1. First Article

- 2.1.1. First Article Inspection Reports (FAIR) shall be prepared per AS/EN9102, ASQR-01, **COL-ASQR-PRO-0003 & LS-SBU-A002-SQA** requirements/specifications.
- 2.1.2. Complete FAIRs, including lower level assemblies, shall be made available to the LS SQA representative for approval and or acceptance of completion.
- 2.1.3. Completed FAIR packages shall be scanned and submitted to Content Server once approved by SQA representative, prior to shipment to LS site
- 2.1.4. **In addition to requirements outlined in ASQR-01, COL-ASQR-PRO-0003 and LS SBU-A002-SQA, at a minimum a partial FAI shall be performed when transferring to a new processor, sub-tier, or when there is a change in the manufacturing source of standard hardware.**
- 2.1.5. **Approved FAIR submissions into Content Server does not relieve the supplier from ensuring all FAIRs to support the revision of product currently delivered including associated Full, Partial, Incomplete, as appropriate and Complete FAIRS are readily available. This includes all Detail FAIRs for Assembly FAIs and associated certifications of conformance for standard hardware and processes/material. (See LS-SBU-A002-SQA)**
- 2.1.6. **First Article Inspection Using Model Based Definition (3-D Modeling):**
  - 2.1.6.1. **It is the responsibility of the supplier to adhere to all AS9102 current revision requirements.**
  - 2.1.6.2. **The Model Based Definition shall be the governing authority in the supplier's manufacturing, inspection, and all subsequent operations.**
  - 2.1.6.3. **The supplier shall flow down all required information to their sub tier from the design authority. If the flow down information is not generated by the 3D model, a point by point overlay based on the model definition authority will be submitted to LS design engineer approval prior to processing.**
  - 2.1.6.4. **In the case of CMM, laser, optical or other 3D electronic measuring equipment verification of attributes of the part from the Model Based Definition, the measuring equipment software shall be capable of properly interpreting the model without translation errors.**
- 2.1.7. For forgings, castings, and swagings, an LS M&PT Product Qualification Process Approval must be included with the FAI package.

### 2.2. Product Qualification Process Requirements for Forgings, Castings and Swagings

- 2.2.1. Product Qualification process shall be performed pre-production (reference DMS 1677, 1935)

- 2.2.1.1. A detailed product qualification report and a manufacturing plan/traveler router/technique sheet representing all process steps used to manufacture the forging casting or swaging shall be submitted to the LS M&PT of the procuring facility for review and acceptance
- 2.2.2. Required elements as part of the product qualification process are as follows:
- 2.2.2.1. Description of each process and operation applicable to the parts including heat treat racking or loading information (sketch or photograph preferred)
- 2.2.2.2. Thermal treatments, including "set" temperatures and times
- 2.2.2.3. The results of all metallurgical and quality evaluations as required by design, drawing / model, applicable specifications and purchase order. Evaluation results are to include the following as a minimum:
- 2.2.2.3.1 Two sets (one for LS and one for supplier) of original photographs of microsections (at least 1X magnification that is not photocopies). Grain flow shall follow the general part contour with no re-entrant grain flow lines.
- 2.2.2.3.2 Microstructural verification including decarburization/carburization test results
- 2.2.2.3.3 Chemical analysis report
- 2.2.2.3.4 Mechanical properties test report
- 2.2.2.3.5 Hardness test results
- 2.2.2.3.6 Nondestructive test results
- 2.2.2.3.7 Dimensional layout report
- 2.2.2.3.8 The raw material certifications from which the first article part was manufactured
- 2.2.2.3.9 All certifications for any outside special processing and testing
- 2.2.2.3.10 Copies of each LS closed rejection reports (QNs) covering non-conformances that exist on the first article part, as applicable.
- 2.2.2.4. Any magnetic particle, x-ray, or ultrasonic inspection techniques used to inspect the parts. Nondestructive testing (NDT) procedures and techniques shall be approved by a certified Level III of the applicable NDT process. Approval signature is required on applicable procedures and techniques. Level III certification shall be from a recognized, independent approving body.
- 2.2.2.5. When the engineering drawing / model requires first article submittal to the LS customer, two copies of the first article report with original grain flow photographs (when required) shall be submitted.
- 2.2.2.6. Unless otherwise specified on the engineering drawing / model or purchase order, the metallurgical qualification for left and right-hand parts is required for one, but not both, provided processes are identical for either product.
- 2.3. Records of Manufacturing:
- 2.3.1. The supplier and supplier's sub-contracted sources shall maintain manufacturing records that provide traceability to all manufacturing and inspection operations. These records shall clearly indicate material status and acceptability and shall include the following information as a minimum:
- 2.3.1.1. Part number, revision, and material traceability.
- 2.3.1.2. List of all serial numbers (if serialized) or quantity of parts (if non-serialized).
- 2.3.1.3. Clear description of operations performed in the proper sequences to produce the completed product to include in process, receiving, and final inspections.

- 2.3.1.4. Record the number of parts accepted or rejected at each completed operation. Rejected serial numbers, if serialization is a requirement, and rejection documents/reports shall be noted adjacent to the applicable operation.
  - 2.3.1.5. Record date of acceptance or rejection activity at each operation with operator's stamp or initials.
  - 2.3.1.6. Clearly reflect the identification requirements, applicable specification, content and method. This can be accomplished as part of the Shop Traveler identification operation, reference to a work instruction or an attached picture of a correctly identified completed part (preferred).
  - 2.3.1.7. When manufacturing lot quantities are reduced or "split", activity shall be recorded at applicable operations on both the original and on the new Shop Traveler. If serialization is required, the serial numbers remaining on the original and the serial numbers being transferred to the new traveler shall be clearly noted.
  - 2.3.1.8. For operations performed by an outside source, record information traceable to source used, process purchase order, or certification number.
  - 2.3.1.9. Note: Verification of any special process planning to ensure compliance to the specification parameters shall be accomplished prior to the actual process being performed. Objective evidence of the plan approval shall be retained and available upon request.
    - 2.3.1.9.1 Evidence of any required rework activities
    - 2.3.1.9.2 Evidence of completion of MRB disposition actions.
- 2.4. Material Certification requirements:
- 2.4.1. Laboratory certifications shall reflect actual values, including mill data.
  - 2.4.2. The supplier is responsible for approval of material received including traceability to the manufacturing source
  - 2.4.3. All LS consigned material (i.e. forgings and castings), drop-shipped from a LS forging supplier to a manufacturing supplier shall be accompanied by a packing slip and Certificate of Conformance.
  - 2.4.4. Material that is shipped directly from a LS site to a manufacturing supplier shall include the forging/casting/swaging certification, Certificate of Conformance and LS shipping ticket having a LS quality acceptance stamp(s).
- 2.5. Process Certification Requirement:
- 2.5.1. The tier 1 supplier shall verify product compliance from services provided by processors.
  - 2.5.2. Utilization of Doc200 Processors when required does not alleviate the supplier for ensuring all product and process requirements are met and validated.**
- 2.6. Forgings/Castings/Raw Material:
- 2.6.1. All forgings, castings and swaging's shall be identified with a vendor code or logo, which shall be specific to that particular supplier and/or per drawing requirements.
  - 2.6.2. The supplier shall maintain traceability from the raw material manufacturer's heat or lot numbers to each individual forging, casting, and swaging. Heat or lot numbers shall be noted on supplier's Certification of Conformance.

- 2.6.3. *Suppliers (Tier1 to LS purchasing document) are required to select a sample of each material type per material supplier (e.g. carbon steel, alloy steel, stainless steel, aluminum, etc.) used on Collins Aerospace parts and independently test at a accredited lab holding an A2LA or Nadcap accreditation for the material composition and chemistry to verify compliance with applicable engineering requirements, annually. Test reports provided upon original material delivery may not be used as proof of compliance; this is intended as a third party validation.*
- 2.6.4. Raw Material Suppliers shall have a process control methodology in place for identifying tracking and trending for the following key characteristics Ultimate Tensile Strength (UTS), yield strength (YS), Elongation, and Reduction of Area (R of A). Results and actions taken shall be made available upon request.
- 2.6.5. In addition to the requirements of AMS 6419 and LGMS1000, producers of material supplied and certified to these specifications shall demonstrate on-going process capability and control with respect to the following key characteristics:
- 2.6.5.1. Transverse ultimate tensile strength,
  - 2.6.5.2. Yield strength,
  - 2.6.5.3. Elongation and percent reduction of area on every VAR heat produced.
  - 2.6.5.4. The material producer shall provide evidence to Collins Aerospace - LS M&PT that the key characteristic data is analyzed per a documented procedure and falls within the process control limits as set by that producer and as determined by the available data.
  - 2.6.5.5. The mill shall also provide evidence that adverse trends in the key characteristic data are identified and corrective action is implemented. In particular, trends in the percent reduction of area shall be used to demonstrate control over the steel cleanliness.
  - 2.6.5.6. The data and analysis shall be supplied to Collins Aerospace-LS M&PT through Content Server on a quarterly (3 month) basis in a format which includes results for each material heat melted.
    - 2.6.5.6.1 See Content Server for instruction on submittal communication requirements
  - 2.6.5.7. Failure to provide the analysis may be grounds for disqualification.

### **3. Identification:**

#### **3.1. Part Marking and Serialization:**

- 3.1.1. Part marking and serialization shall be clearly identified in the supplier's control plan/manufacturing documentation for all parts. Suppliers shall have a process in place to ensure no duplication of serial numbers.
- 3.1.2. The supplier shall maintain a serialization record for each serialized component manufactured. Suppliers shall not duplicate serial numbers on any given part number regardless of revision or configuration changes. Identification and traceability is required for all material, where applicable
- 3.1.3. All product identification (including permanent etching) shall be clearly legible after final surface coatings (including prime and paint) unless specifically allowed per engineering specifications.
- 3.1.4. Country of origin must be identified on all products, bag or tags for imported parts in accordance with U.S. Customs regulation 19 CFR Part 134.11 e.g. "Made in China", "Product of Japan", "Assembled in Italy", etc.
- 3.1.5. All identification shall be applied prior to final inspection.
- 3.1.6. All products shall be identified with LS's customer's (for example, Boeing, Lockheed, Gulfstream) part number as required by the engineering drawing and specification requirements.



3.1.7. When required by drawing, specification, or contract, product shall have supplier's final acceptance stamp on product or on a tag/package, if product does not have an adequate space for stamping.

3.1.8. Serial numbers shall comply to drawing and/or specification requirements

3.1.9. Supplier shall request prefix codes, which will be assigned by LS SQA, as required

3.1.10. A minimum of four and a maximum of six digits (numbers only without spaces or dash "-").

3.1.11. Serial numbers shall not restart from 0001 when the dash number changes.

3.1.11.1. If products are of opposite configuration, left and right handed product, the same serial number **shall not** be used on both hands, opposite configuration.

3.1.11.2. The prefix code of the finished part supplier shall be used in place of the forging, casting, extrusion or swaging supplier prefix code, Example:

Forging	P1234
Finished	XYZ1234

3.1.11.3. The numeric portion only of the forging serial number should apply to the machined detail parts.

3.1.12. Suppliers of the detail items shall provide cross-reference traceability to the original forging serial numbers if new serial numbers are assigned

3.1.12.1. The supplier shall identify on the appropriate quality and shipping documents the serial number of the forging used for the resultant part.

3.1.12.2. The supplier shall provide this information for both LS consigned and LS sold forgings.

3.1.13. Non serialized parts shall be identified with date of manufacture, batch or lot number. Drawing/Specification Requirements apply.

3.1.14. Contact LS Supplier Quality Assurance if further clarification is required.

3.1.15. Identify product with the appropriate design activity code per the engineering drawing / model requirements

3.1.16. The LS manufacturer's identification codes are as follows:

- Oakville MFR02121
- Burlington MFR02KZ1
- Fort Worth MFR6K4C8
- Troy MFR97153
- **Cleveland MFR13002 (used only when defined by contract)**

**Note: Supplier manufacturing codes shall not be used unless specifically called out on the engineering drawing part marking specification requirement.**

3.1.17. When serial number traceability is required by design requirements, applicable serial numbers shall be identified on all supplier and supplier's sub-tier quality records (i.e. travelers and process certifications).

3.1.18. Application of drawing / model revision letters on product is only allowed when required by purchase order, engineering drawing / model or specification.

3.1.19. "Kits" shall have the following identified in a prominent location:

3.1.19.1. Each detail item shall be identified per applicable requirements of engineering drawing / model, specifications, and this document.

3.1.19.2. Quality acceptance approval of the kit.

- 3.1.19.3. Assigned kit part number and revision level.
- 3.1.19.4. Purchase order number and latest amendment level. A supplier assigned unique non-repeatable number for each kit that provides complete traceability to all products within each kit.

#### 3.1.20. Raw Material:

- 3.1.20.1. All bar stock material (each piece) shall be identified with the heat or lot number, purchase order number, or color code as appropriate.
- 3.1.20.2. Material traceability (heat or lot) shall be transferred to the unused bar stock prior to storage.

## 4. Process Control

### 4.1. Manufacturing Plans and Techniques

- 4.1.1. Manufacturing plans (MPS) shall be generated for all individual components and assemblies when the supplier is manufacturing to an engineering drawing / model and does not have design authority.
- 4.1.2. Manufacturing plans (MPS) requiring LS approval shall be submitted and approved by LS prior to start of manufacturing.
  - 4.1.2.1. Coolants used per specification controls must be identified, in compliance and documented on the submitted plan when required. For example, BAC MFG. control DWG 160T1000 high strength steel, Note 3, BAC 5440, BAC5008 (applicable table indicates approved coolants)
- 4.1.3. The planning shall include the minimum engineering data references (specification, flag note, etc.) necessary to control and produce the parts and include all of the machining, processing, test and inspection operations necessary to complete the parts to the purchase order and engineering requirements. This includes applicable satellite plans and techniques from sub tier suppliers and processors.
- 4.1.4. **Note: Developmental aids, including a manufacturing plan template and other similar information are available from LS upon request.**
- 4.1.5. All plans shall be reviewed and approved by the tier 1 holder of the LS purchase order. When plans are required to be submitted to LS, the tier 1 source shall review and approve the plan prior to submission to LS.
- 4.1.6. The manufacturing plan(s) shall be retained on file at the supplier's manufacturing facility or their sub-tier when applicable, and shall be available upon request by LS and/or its customers.
- 4.1.7. The plan documentation shall also be in English and include the following details as a minimum:
  - 4.1.7.1. Name of applicable manufacturer with facility address.
  - 4.1.7.2. Full part number including dash number. When purchase orders refer to part numbers other than the design engineering part number, the planning shall clearly reference both part numbers.
  - 4.1.7.3. Engineering drawing / model revision level.
  - 4.1.7.4. Planning revision table including revision dates and descriptions of changes and traceability to the individual making the change. All planning changes shall be

documented, including editorial changes to correct typographical errors or minor editorial changes.

- 4.1.7.5. Raw material (including forging part number if applicable), raw material specification, raw material size and heat treat condition.
- 4.1.7.6. All operations shall be noted in their proper manufacturing sequence, including all inspection and test points.
- 4.1.7.7. Optional sequences or operations shall be defined in the planning.
- 4.1.7.8. Part identification description including method and text.
- 4.1.7.9. Operations that are required to be performed per a particular specification shall list that specification as part of the operation description in the planning.
- 4.1.7.10. Special process operations shall list the name and location of the processor, applicable specifications and specific parameters (i.e.: type, class, as applicable).
- 4.1.8. Special processes shall be controlled and special process sources shall be approved on Document 200.
- 4.1.9. Maximum section thickness at time of heat treat shall be noted.
- 4.1.10. All thermal processing shall be listed as a separate operation (i.e., embrittlement relief, stress relief, etc.). Required times, conditional delay requirements and temperatures shall be documented.
- 4.1.11. Machining techniques which impart significant localized heating (i.e. EDM, ECM, plasma application, and laser use) shall only be used when authorized by engineering requirements, or MRB disposition.
- 4.1.12. All manufacturing plans and techniques shall be reviewed by the supplier at least every five years to ensure compliance to current engineering and specification requirements.
- 4.1.13. Supplier shall have a process to control the timing of the reviews.
- 4.1.14. **All NDT techniques shall be approved by a recognized NDT Level 3 authority.**
- 4.2. Manufacturing Plan Review and Approval
  - 4.2.1. When purchase order, engineering or contractual requirements, invoke customer planning review and approval, manufacturing planning shall be submitted to LS for review. **See LS-SBU-A004-SQA – LS Manufacturing Plan Review and Approval and LS-SBU-SPL-018- FAI MPS submittal form for suppliers**
- 4.3. Straightening of Parts:
  - 4.3.1. Unless specifically permitted by the engineering drawing and/or its applicable supporting specifications, authorization by LS Material Review Board and/or Materials & Process Technology is required before performing straightening on steel parts heat treated to tensile strengths greater than 150 KSI.
  - 4.3.2. The supplier shall maintain all necessary documentation and data records for each part straightened, and will be made available to customer upon request.
  - 4.3.3. Straightening of steel parts, regardless of temperature, by means of plastic deformation which results in a modified dimensional condition is prohibited.

## 5. Inspection and Testing

### 5.1. Inspection requirements

- 5.1.1. Quality verification for all product and/or service purchased by LS shall be performed at the supplier's facility **prior to shipment to an LS facility/site.**

5.1.2. Utilize LS-SBU-F005-SQA Final Product Review and acceptance record to ensure all requirements are verified prior to release or source inspection by LS authorized personnel.

5.1.3. Certificate of Conformance shall be provided for each shipment in accordance to LS-SBU-A003-SQA, Release of Products and Services- (Certificate of Conformance Requirements).

5.1.4. Requirements and training material for inspection including Source and Designated Quality Representative (DQR) is available on Content Server (Reference AS13001 Supplier Self Release Training Requirements)

5.1.5. Source inspection does not relieve the supplier of any responsibility and/or liability for full compliance with all contract and quality requirements.

5.1.6. The Supplier shall request LS product verification at the Supplier's facility. Supplier shall contact their assigned PQR, Verify Representative, or internal DQR as applicable.

5.1.7. Waivers for change of source location shall be documented using LG DIV SQA FORM 3825.

5.1.7.1. The suppliers SQA PQR focal shall be advised of the request for waiver.

5.1.8. The approved LS SQA waiver shall accompany the shipping documents.

5.1.9. Verbal waivers may be granted by LS Supplier Quality Assurance personnel only. The shipper or packing slip shall contain a statement of when the verbal waiver was granted and by whom.

#### 5.2. Source Inspection (Certified Suppliers)

5.2.1. Lots shall be inspected for dimensional and specification conformance by the supplier's final inspection personnel in accordance with the supplier's quality system and applicable LS quality flow down requirements.

5.2.2. The DQR verification shall be separate and independent from the supplier's final inspection process.

5.2.3. Authorization and training of DQR personnel will be the responsibility of LS SQA.

5.2.4. The DQR shall stamp and date the LS SBU F005 SQA and each certification, as evidence of review and acceptance.

5.2.5. The DQR shall note acceptance of each shipment by stamping and dating the "Certification of Compliance" and the supplier's packing list/shipper by using the LS supplied DQR acceptance stamp.

5.2.6. Use of the DQR stamps by any other person than the assigned DSQAR will be cause for loss of certification.

#### 5.3. Source Inspection (De-Certified suppliers)

5.3.1. De-certified suppliers are responsible for all costs associated with having their product verified prior to being received by LS, except for First Article Inspection verification.

5.3.1.1. Suppliers are responsible to initiate requests for source inspection support when the product is complete, accepted through their quality systems, and ready for source inspection.

5.3.2. The supplier shall make initial contact and establish a purchase order with the LS authorized agent:

5.3.2.1. The agent authorized by LS to inspect product is "Verify, Inc." of Irvine, CA.

5.3.2.2. A primary Verify Project Specialist shall be assigned to each participating supplier

5.3.2.3. After initial contact with Verify and assignment of authorized primary Verify Source Inspector, suppliers may contact the source inspector directly or contact Verify Dispatch Department.

- 5.3.2.4. If a Verify representative is not available for any specific reason, LS personnel will perform the required product verification at the expense of the supplier.
- 5.3.2.5. The supplier shall provide support for the inspection as judged reasonable for the Verify Project Specialist to perform an adequate product verification/inspection.
- 5.3.2.6. Suppliers shall maintain a record of all product presented for contract source verification by part number, quantity, date and Verify representative used. This record shall be made available upon request.

#### 5.4. Special Inspection Requirements / Techniques:

- 5.4.1. Suppliers shall verify threaded product using the thread inspection method defined as System 22 in ANSI/ASME B1.3(current revision) with the following modifications (unless more stringent requirements are specified by contract or drawing):
- 5.4.2. Visual Inspection per ANSI/ASME B1.3, paragraph 6(c).
  - 5.4.2.1. Maximum Material functional acceptance to a GO thread gage per ANSI/ASME B1.3, Column A1, Row 1.1, of Table 1 or Table 2 as applicable. Use a thread plug gage per ANSI/ASME B1.2 section 4.1 for internal threads. Use a thread ring gage per section 5.1 for external threads. Suppliers shall procure and maintain calibrated gages for functional product verification before and after any plating. After plate gauges shall be used for final product acceptance.
  - 5.4.2.2. In the event of a thread attribute gauge dispute between facilities (i.e. suppliers and LS site gauges that accept and reject the same parts); the NIST calibration certification provided by the supplier from an ISO 17025 accredited lab shall be the refereeing source. If the dispute still cannot be resolved, the supplier or LS may choose a third party as a refereeing source which is an ISO 17025 accredited facility or higher on the NIST hierarchy.
  - 5.4.2.3. Major diameter size measurement per ANSI/ASME B1.3, Column J2, of Table 1, external threads only.
  - 5.4.2.4. Pitch diameter size measurement per ANSI/ASME B1.3, Column C2, of Table 1 or Table 2 as applicable.
    - 5.4.2.4.1 Note: It is recommended that those suppliers that manufacture class #3 series internal and external threads shift their process means toward minimum material condition.
  - 5.4.2.5. Minor diameter size measurement per ANSI/ASME B1.3, Column K2, of Table 1 or Table 2 as applicable.
  - 5.4.2.6. Root radius size measurement per ANSI/ASME B1.3, Column L, of Table 1, external threads only.
    - 5.4.2.6.1 Exception: For tapped holes with internal threads of nominal size less than 0.190", only the functional acceptance and the minor diameter inspections need to be performed.
  - 5.4.2.7. Suppliers shall verify splined product using the spline inspection method defined in ANSI B92.1 section 16.4 (which includes, but is not limited to, the use of GO composite and NOGO sector gages) unless more stringent requirements are specified by contract or drawing.

#### 5.5. Drop Shipments:

- 5.5.1. When authorized by PO, suppliers can ship directly to LS customers or other LS Divisions using the supplier shipping documentation:

- 5.5.1.1. The shipper shall be provided by the LS buyer that identifies drop shipment instructions/requirements.
- 5.5.1.2. The PO number shall be referenced.
- 5.5.1.3. If serialized, the serial numbers being shipped shall be recorded on the shipper and submitted to LS SQA PQR or designee through Content Server for final clearance. LS buyer shall provide the stamped and dated shipper back to the supplier upon successful completion of serial number clearance.
- 5.5.1.4. The supplier shall provide a completed LS shipper, packing slip and Certification of Compliance per the LS buyer instructions.

## **6. LS supplied tooling, gages, and fixtures:**

6.1. See **COL-ASQR-PRO-0003**

6.2. See Customer Requirements section within this document for additional requirements.

## **7. Handling, Storage, Preservation and Shipping:**

7.1. Electro Static Discharge sensitive material:

7.1.1. Suppliers delivering Electro Static Discharge sensitive product shall ensure its protection during the manufacturing process and identification per MIL-STD-1686 and ESD packaging for delivery (connector caps, bags, and bubble sheets) per MIL-STD-2073 and MIL-HDBK-263.

7.2. Protection of sensitive surfaces

7.2.1. Machined parts with finished or semi-finished unprotected (not plated) surfaces will be delivered with these surfaces covered with protective oil (reference LGPS 1000 Corrosion Protection of Parts or applicable specifications).

7.2.2. All threaded items shall have thread protection. Caps or equivalent protection will cover external threads.

7.3. Packaging Specifications:

7.3.1. The packaging of product shipped to LS shall ensure protection from transit damage and shall at a minimum comply to:

7.3.1.1. Reference ASTM-D3951 for "Standard Practice for Commercial Packaging"

7.3.1.2. Reference MIL-STD-2073-(current revision) for "Standard Practice for Military Packaging"

## **8. Nonconforming Product:**

8.1. General Requirements

8.1.1. Suppliers shall not ship nonconforming material without receipt and completion per LS MRB disposition or unless authorized in writing by MRB disposition or receipt of an approved "Request for Custody" form.

8.2. **(\*WB)** MRB submission

8.2.1. Supplier shall submit a completed Supplier Material Review Record (Form 815) to the LS Buyer/or Supplier Quality focal.

8.2.2. A unique MRB number will be determined by LS.

8.2.3. Items which have been accepted by the MRB are identified per instructions provided with the form.

8.2.4. Shipment for material with MRB shall be identified per MRB instructions. All material certifications for MRB approved material shall reference appropriate MRB number.

8.2.5. Approval must be granted by LS prior to product shipment.

- 8.2.6. Approval for shipment does not establish any precedent for future non-conforming material.
- 8.2.7. The supplier must maintain a copy of the dispositioned Supplier Material Review Record (Form 815) with their quality records for the affected material

### 8.3. (\*LG)MRB submission

- 8.3.1. For a discrepancy discovered that may be reworked into a conforming condition prior to subsequent processing, the supplier's standard internal rework process shall be followed. Rework records shall be maintained as per the Records of Manufacturing
- 8.3.2. For a discrepancy discovered within a special process or during, the guiding specification for that specific special process may provide rework guidelines. Rework records shall be maintained as per the Records of Manufacturing
- 8.3.3. Any NDT rejections must be submitted to LS MRB for review and disposition.
- 8.3.4. The supplier shall document the discrepancy on a LS Quality notification(QN) form (LG DIV SQA FORM 2963):
  - 8.3.4.1. See naming convention requirements for QN submission in Content server
  - 8.3.4.2. Shall contain a clear description of actual or suspect nonconformance.
- 8.3.5. When completing the Vendor Initiated Quality Notification Entry Sheet the requestor must include all appropriate email addresses at bottom of form (i.e buyers, quality, and associated required communication points between supplier and customer), the QN number will submitted back to suppliers through Content server.
- 8.3.6. Once disposition is obtained from LS MRB each element of the disposition shall be stamped off and dated as evidence of completion.
- 8.3.7. If any special processes are used for the repair, the supplier shall list the processor used, the certificate number, and date.
- 8.3.8. Dispositioned QN's shall be treated as a repair router and follow the part(s) through the entire repair process, stamped and dated as the operations are in fact completed.
- 8.3.9. Except when specifically authorized by the engineering drawing / specifications or LS Material Review Board (MRB) disposition, welding on any LS assemblies or machined/formed detail components for the purpose of repair is prohibited.

### 8.4. Disclosures (Notice of Escapement, NOE):

- 8.4.1. Suppliers shall provide written notification to LS within 24 hours when a nonconformance is determined to exist, or is suspected to exist, on product already delivered to LS or LS customers using the AS9131 template.

### 8.5. MRB Administrative Costs

- 8.5.1. Suppliers are responsible for administrative costs incurred by LS and associated with the Material Review and disposition of supplier manufactured nonconforming product.
- 8.5.2. Any costs associated with rework of discrepant material may be charged to the supplier.
- 8.5.3. Any requests for "CHANGE OF CHARGE" shall be submitted to the appropriate LS supplier quality focal.

## 9. Service and Warranty

### 9.1. General Requirements

- 9.1.1. Service and warranty repair components shall not be mixed with new production components during manufacturing or storage. They shall not be assembled into new production without the written authorization of LS and (when required) concurrence of LS customer.

- 9.1.2. All Service and Warranty components shall be uniquely identified by LS or through supplier non-conformance control methods for traceability in the supplier's system throughout the repair process.
- 9.1.3. Repairs shall not begin without a repair purchase order and LS authorization.
- 9.1.4. Parts and assemblies received from LS or a LS customer which are not accompanied by a service routing, inspection requirements/definitions, or having a specific disposition shall be inspected and tested (if appropriate) to confirm the rejection. Items are to be subsequently disassembled for component inspection when applicable. When parts and assemblies are accompanied by a service routing or inspection QN, the instructions contained therein are to be followed.
- 9.1.5. The inspection results and analysis, Failure Analysis Report (FAR) showing the date of original manufacture and date returned items were received, shall be maintained, controlled, and submitted to LS for review and approval, upon request. The results shall include:
- 9.1.6. All inspection/rejection MRB generated on components found discrepant (all MRB shall be marked "Service")
- 9.1.7. Corrective actions for discrepant items that are the supplier's responsibility, and a repair quotation (when applicable) with a listing of all LS consigned inventory required to complete a specific repair.
- 9.1.8. Serialized Component list (the supplier is responsible for only the components replaced during the warranty or repair rework).
- 9.1.9. ATP/Test Report
- 9.1.10. MRB clearance list of all new/consigned parts used in the repair (list all other open issues or QNs with the serviced item).
- 9.1.11. Any MRB QNs generated with approved MRB clearance during the repair process.
- 9.1.12. Replaced items shall be accompanied by Certification of Compliance, which shall include applicable data such as cure dates for o-rings, seals, etc. FARs shall be completed within 30 days upon receipt
- 9.1.13. All documentation should also be identified with the LS service work order and/or purchase order number.
- 9.1.14. FAR reports shall be submitted through Content Server when required.

## **10. Corrective Action Process**

### 10.1. General Requirements

- 10.1.1. Suppliers/processors shall provide written acknowledgement as to the receipt of a corrective action from LS with confirmation of containment and Corrective Action team members identified within the timeline specified by the SQA focal.

## **11. Preventive Action/Continuous Improvement**

### 11.1. Control of Key Characteristics

- 11.1.1. Suppliers shall have a process for control and analysis of key characteristics as defined within the engineering drawing, model, purchase order and when the part(s)/process is specifically designated for SPC/process capability by LS.
- 11.1.2. All data pertaining to key characteristics shall be made available upon request and will require approval by LS Supplier Quality Assurance.
- 11.1.3. When required, data will be provided in the format prescribed per AS9103, Variation Management of Key Characteristics (VMKC)



11.1.4. All processes that effect key characteristics shall be evaluated for statistical process capability (Cpk).

11.1.4.1. Cpk values less than 1.33 shall be addressed by the supplier with an improvement plan.

11.1.4.2. Cpk values less than 1.00 shall be addressed by the supplier with a CA (supplier's format)

#### 11.2. ZDP™

11.2.1. ZDP™ shall be used for escape mitigation and long term corrective and/or preventive actions when requested by LS. Link to ZDP™ methodology can be found here:

<https://global.utas.utc.com/sites/Quality/SitePages/ZDP.aspx>

## 12. Special Processes

### 12.1. Approval of Special Processors:

12.1.1. The request shall be made in writing to Supply Chain Management using **form LS-SBU-F001-SQA** - Request for Processor Approval (Content Server), stating the processor's company information and listing the processes and specifications the supplier is requesting the processor to support.

12.1.2. Processors that perform special processes that are Nadcap commodities are required to have Nadcap accreditation. Any exceptions to this requirement will be based on LS Supplier Quality management approval of a request for waiver.

12.1.3. Approvals are granted for each individual processor / process / specification combination, and are site location specific. Physical relocation of processing requires LS re-approval of the re-located processing prior to any use of that re-located processing on LS product.

12.1.4. Document 200 is the official LS listing of approved processors. On occasions when new processors are approved by LS but not evident pending revision of the public version of Document 200, an e-mail from LS Supplier Quality Assurance may suffice as evidence of approval until the public version is revised.

12.1.5. Special process sources approved by LS for a LS, Military or Industrial specification that has been superseded by another LS, Military or Industrial specification shall be considered approved for the superseding specification.

### 12.2. Supplier's use of Approved Processors:

12.2.1. Only LS approved sources shall be used to perform special processes on aircraft production parts manufactured for LS engineering drawings/design.

12.2.2. When LS customer controlled processes are required, (i.e. Boeing "BAC's", DPS, "PS's", and Lockheed "5PTP's"), selected process sources shall be listed in both the LS Doc 200 listing as approved for quality system and in the applicable customer's listing (i.e. Boeing D1-4426, and Lockheed QCS-001) for the controlled process.

12.2.3. The supplier shall maintain and use an approved processor list, and are responsible for ensuring that approved sources meet the requirements of the applicable specifications.

12.2.4. Suppliers are responsible for ensuring that processing meets the requirements of the applicable specifications defined in the engineering and contractual requirements.

12.2.5. The supplier's purchase order shall flow down to the processor all applicable information required to perform work correctly to engineering and contractual requirements and as required by individual process specification and end customer requirements. The purchase order shall clearly specify the full scope of processing to be performed, MRB actions required, applicable specification number(s), revisions and addendums or modifications, part numbers, quantity, serial

numbers (if applicable), applicable program and prime customer and identify LS as the supplier's direct customer.

#### 12.3.Processor Requirements:

12.3.1. Work shall be planned, approved and executed in accordance to the scope of work being performed.

12.3.2. A packing slip, Certificate of Compliance, and inspection records shall be included with all shipments.

12.3.3. Unless allowed by LS specification requirements, for serialized parts, heat treat sources shall record actual hardness values for each serial number.

12.3.4. Objective evidence of compliance to specifications and drawings shall be made available upon request.

12.3.5. Ensure a performance metric that will measure internal rework for each approved process and will be made available upon request.

### 13. Specific LS Customer Requirements:

#### 13.1.Airbus:

13.1.1. Suppliers shall implement a Risk Management and mitigation process for all processes including sub-tiers.

13.1.2. All Airbus Quality requirements must be in accordance with GRESS (current revision), Airbus's Quality Requirement document. (See Content Server)

13.1.3. Product designated with key characteristics shall include an approved ICY (interchangeability) document completed per requirements with each shipment

#### 13.2.Lockheed Martin (LM):

13.2.1. Suppliers shall comply to applicable Appendix QX (current revision) LM Aero Supplier Quality Requirements. (See Content Server)

13.2.2. LM Counterfeit Parts Prevention (for the following verbiage Seller is defined as LS suppliers, Buyer is LS:

13.2.2.1. Seller shall establish and maintain a Counterfeit Parts / Material Prevention and Control Plan using AS-5553 (Ref. elements of Section 4) and/or AS6174 (Ref. elements of Section 3) to ensure that Counterfeit Work is not delivered to Buyer. The purpose of Seller's Plan shall be to develop a robust process to prevent the delivery of counterfeit commodities and control commodities identified as counterfeit

13.2.2.2. a) For purposes of this clause, Work consists of those commodities delivered under this Contract that are the lowest level of separately identifiable items (e.g., articles, components, standard hardware, goods, raw materials and assemblies). "Counterfeit Work" means Work that is, or contains, items misrepresented as having been designed and/or produced under an approved system or other acceptable method. The term also includes approved Work that has reached a design life limit or has been damaged beyond possible repair, but is altered and misrepresented as acceptable.

13.2.2.3. b Seller shall only purchase products to be delivered or incorporated as Work to Buyer directly from the Original Component Manufacturer (OCM)/Original Equipment Manufacturer (OEM), OCM/OEM authorized distributor chain, Aftermarket Manufacturer, or Authorized Reseller. These products shall have verification that Work is traceable to OCM/OEM; OCM/OEM authorized distributor chain, Aftermarket Manufacturer, or Authorized Reseller that identifies the name and location of all the supply chain intermediaries from the part manufacturer to

- 13.2.2.4. the direct source of the product for the Seller. Work can only be acquired from independent distributors or brokers in cases of diminishing material supply (DMS) or obsolescence and shall be subjected to a screening process appropriate to the commodity in accordance with the Counterfeit Parts / Material Prevention and Control Plan. If traceability is not obtainable, written notice shall be provided to the Supplier Quality Engineer and Buyer prior to delivery with records of evidentiary tests and inspections performed and conformance of the product to specified acceptance criteria that ensures verification activities taken to assure authenticity. Written notice is not required for raw material and standard hardware purchased from independent distributors or brokers, but products must be able to provide commodity level traceability to the Original Manufacturer.
- 13.2.2.5. c) Seller shall notify Supplier Quality Engineer and Buyer in accordance with 2.2 with the pertinent facts if Seller becomes aware or suspects that it has furnished Counterfeit Work. Seller shall provide to Supplier Quality Engineer and Buyer, upon request, the supply chain traceability to an Original Manufacturer or authorized distributor chain that identifies the name and location of all the supply chain intermediaries from the part manufacturer to the direct source of the product for the Seller.
- 13.2.2.6. d) Seller shall include this clause or equivalent provisions in lower tier subcontracts for the delivery of items that will be included in or furnished as Work to Buyer. Sellers eligible for utilization of the Government-Industry Data Exchange Program ("GIDEP") shall utilize the GIDEP process to alert the industry of encountered counterfeit parts.
- 13.2.3. If additional information is required, the supplier shall contact the LS buyer. The LS buyer will then contact the appropriate PQE or Program Management for clarification.
- 13.2.4. For suppliers providing LM product suppliers shall comply with LM's PM-5010 (current revision)
- 13.3. Transport Canada
- 13.3.1. To assure continued compliance to our customers as well as regulatory bodies, in this case Transport Canada, reference 561.13 (3) No supplier who performs work for a holder of a manufacturer certificate under this Subpart shall subcontract the work to another supplier without having first obtained the written consent of the holder of a manufacturer certificate. as a supplier to LS providing product to LS as a manufacturing certificate holder per Transport Canada and you plan to subcontract any work that does not constitute an approval within the current construct of This document, i.e. MPS approvals, Doc 200, you will need to contact your buyer or SQA representative (PQR) requesting written consent prior to subcontracting.
- 13.3.2. The request will be in the form of the supplier choice and will include the subcontractor company name, address of manufacturing (service) and a short description of the sub-contracted service to be provided.
- 13.3.3. LS shall communicate the written consent back to the author of the request.
- 13.3.4. Copies of the request and written consent shall be maintained by the supplier and shall be subject to the requirements of record management as outlined in section 1.7 of this document.
- 13.4. Boeing
- 13.4.1. For U.S Government owned special tooling (ST) accountable to Boeing or Boeing owned special tooling (ST) the requirements of D950-11059-1, BDS Seller Special Tooling Requirements is applicable.
- 13.4.2. The supplier shall ensure that all standard hardware with Boeing design authority is procured from approved manufacturers and distributors in compliance with Boeing's D-590 Parts Standards specification requirements.

13.4.3. The supplier shall ensure that First Article Inspection records for all standard hardware with Boeing design authority are available upon request

13.4.4. Reference Boeing D1-4426: User Instructions & Requirements:

13.4.4.1. "5.1.2.1 Purchasers are required to adequately define and document the statement of work, where appropriate: specification, specification revision, specification departures, Type, Class, Grade, program number, design authority, pre/post processing steps, as applicable. The organization shall ensure the adequacy of specified purchase requirements prior to their communication to the processor. Note: This applies to tier one suppliers or Landing System sites offloading special process work to an approved Boeing source."

13.4.4.2. "7.2.1 Processors shall perform contract review prior to accepting an order to ensure the purchaser has adequately defined and documented the statement of work which includes, where appropriate: specification, specification revision, specification departures, Type, Class, Grade, program number, design authority, pre/post processing steps, as applicable"

13.4.4.3. "Note: The specific purchase order processing information required to be flowed down on the purchase order to the special processor is identified in the Boeing Appendix D. Some information is always required and other information is required when applicable."

13.4.4.4. This appendix is available on the Boeing Approved Process Sources D1-4426 web site (link provided). <http://active.boeing.com/doingbiz/d14426/Appendix-D.pdf>

13.4.5. *Where Boeing build to print Digital Product Definition is the design authority, suppliers are responsible for compliance to the applicable sections of **Boeing's D6-51991 - Quality Assurance Standard for DPD at Boeing Suppliers**; link <http://www.boeingsuppliers.com/>. Supplier's compliance to D6-51991 will be assessed. Reference LS-LG-W-426-ENG, in Content Server for more information and LS requirements associated with D6-51991.*

13.4.6. *For Boeing Commercial product, Boeing quality clauses, **Q09, S68, U40**, found in Content Server, are required to be flowed down from LS to our suppliers and Boeing requires that the provisions/requirements set forth above be included in LS direct supply contracts as well as the obligation that they be flowed to the sub-tier supply chain. This paragraph invokes the requirement as our flow down to suppliers.*

13.5. *Sumitomo Precision Products (MRJ program)*

13.5.1. *AQ1-11108 Visual Inspection Procedure of Parts for MRJ program*

13.5.1.1. *Compliance of AQ1-11108 is invoked to LS and its suppliers that provide product supporting the Mitsubishi Regional Jet program per SPP Quality Control Document AQI-726. Both are available on LS Content Server.*

## **14. References (Outside of LS):**

14.1. SAE AS9100 (current revision) Quality Systems – Aerospace – Model for Quality Assurance in Design, Development, Production, Installation and Servicing

14.2. SAE AS9102 - Aerospace, First Article Inspection Requirements

14.3. SAE AS9103 - Variation Management of Key Characteristics

14.4. SAE AS9120 - Quality Management Systems – Requirements for Aviation, Space and Defense Distributors

14.5. SAE AS9131- Quality Management Systems – Non Conformance Documentation

14.6. ISO 9001 (current revision) – Quality Management System - Requirements

14.7. Airbus – GRESS – General Requirements for Equipment and System Suppliers

14.8. ISO 10012 (current rev.) - Measurement Management Systems

14.9. Lockheed Martin Appendix QX (current revision)

14.10. Transport Canada CAR 561 (current revision)

14.11. National Defense Authorization Act, Section 818, Detection and Avoidance of Counterfeit Electronic Parts

14.12. Boeing D1-4426 - User Instructions and Requirements

### 15. Change Log:

<u>Revision Date</u>	<u>Reference</u>	<u>Comments</u>
April 30, 2015	New	Previous Document 300 LG DIV SQA MAN 001, AWB9100; Complete rewrite with inclusion of new ASQR01, UTAS PRO 0003, into this addendum
June 25, 2015	01	Section 1.5 updated to clarify process specification usage requirements and approval requirements Section 4.1.2 . MPS submittals for approval into LS added <u>and approved by LS</u> Section 5.2.6.4.1 Cadmium Plating (LHE) additional requirements
Sept. 9, 2016	02	Updated Table of Contents page numbering, Minor grammatical changes (6/17/2016) Added Section 1.8 – UTC,UTAS, LS Web Document links (6/17/2016) Added Section 1.9.5 – file submission size limits to 4 megabyte (6/17/2016) Added Section 13.5 Sumitomo Precision Products Quality requirements- (MRJ program) (6/17/2016) Added Section 13.4.4.5 – Boeing D6-51991 (DPD) (6/17/2016) Added Section 13.4.4.6 – Boeing clauses Q09, S68, U40 (6/17/2016) Updated section 3.1.9 to clarify part marking application related to ink and clear coat (8/17/2016) Updated Section 2.1 First Article (8/17/2016) Updated Section 3.1, Part Identification (9/9/2016) Various changes in grammar and clarification throughout (9/9/2016)
1/1/2019	03	Major update in all sections including removal of duplicity now in either ASQR-01 and/or COL-ASQR-PRO-0003. Created addendums LS-SBU-A003 and LS-SBU-A004-SQA and posted in Content Server as detail for requirements that were originally contained in this document