

Landing Systems

Title: Supplier Quality Requirements	Doc #: LS-SBU-A001-SQM
Functional Group: Supplier Quality Management	Revision: 02

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1. PURPOSE & SCOPE

1.1. Purpose

This document defines Collins Aerospace Landing Systems (LS) quality requirements for Suppliers, sub-tier Suppliers, processors, and sub-tier processors, referenced in this document as: Supplier or Suppliers. Collins Aerospace Landing Systems, referenced in this document as: Buyer.

Landing Systems includes: Landing Gear (LG) and Wheels and Brakes (WB).

This document augments the requirements noted in ASQR-01 and or COL-ASQR-PRO-0003.

1.2. Scope

This document applies to all LS Suppliers when LS-SBU-A001-SQM is invoked by direct reference on the purchase order.

Wheels and Brakes specific requirements herein are identified (*WB) and Landing Gear specific requirements herein are identified (*LG).

No deviations from these requirements are permitted unless specifically authorized in writing by LS Supplier Quality Management (e.g., LS-SBU-F010-SQM, Quality Alert, ASQR-01 Form 3, Buyer's Contractual Letter or Coordination Memo).

2. RESPONSIBILITIES

2.1. LS Supplier Quality Management (SQM)

In collaboration with LS Supply Chain Management (SCM), are responsible for the management and administration of the requirements contained within this document.

2.2. Suppliers

The use of Collins Approved Special Processors or receipt of Collins approvals (e.g., FAI Approvals, Source Inspection) does not relieve the Supplier of any responsibility and / or liability for full compliance with all contract and quality requirements.

Supplier **shall** submit ASQR-01 Form 3 to Buyer and Supplier Quality Representative when a deviation from requirements noted herein has been determined to exist.

Note: ASQR-01 Form 3 is used for communication only; it is not used for disposition of product non-conformances to engineering requirements.

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2.3. Program Management or their designee

Will engage with the customer when planning review requires customer review and approval.

3. REFERENCES & FORMS

3.1. Industry Documents

- SAE AS9100 (current revision) Quality Systems – Aerospace – Model for Quality Assurance in Design, Development, Production, Installation and Servicing
- SAE AS9102 – Aerospace, First Article Inspection Requirements
- SAE AS9103 – Variation Management of Key Characteristics
- SAE AS9131- Quality Management Systems – Non Conformance Documentation
- ANSI B92.1 - Metric Module Involute Splines
- ANSI / ASME B1.3 – Screw thread Gaging Systems for Acceptability: Inch and Metric Screw threads (UN, UNR, UNJ, M, and MJ)
- SAE AS5553 - Counterfeit Electrical, Electronic, and Electromechanical (EEE) Parts; Avoidance, Detection, Mitigation, and Disposition
- SAE AS6174 – Counterfeit Material; Assuring Acquisition of Authentic and Conforming Material
- SAE AS9138 – Aerospace Series – Quality Management Systems Statistical Product Acceptance Requirements
- SAE AS9162 – Aerospace Operator Self-Verification Programs
- ASTM-D3951 – Standard practice for Commercial Packaging
- ISO / IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories
- MIL-STD-2073 - Standard Practice for Military Packaging
- MIL-STD-1686 – Electrostatic Discharge Control Program for Protection of electrical and Electronic Parts, Assemblies and Equipment
- MIL-HDBK-263 - Electrostatic Discharge Control Handbook for Protection of electrical and Electronic Parts, Assemblies and Equipment

3.2. Collins Aerospace Documents (RTX, UTC, UTAS, Goodrich)

- ASQR-01 - Aerospace Supplier Quality Requirements
- ASQR-01 Form 3 - Supplier Request for Information
- COL-ASQR-PRO-0003 - Supplier Quality Common Supplier Requirements
- CPC6400 – UTAS (Goodrich) Shot Peen
- Form 815 - Supplier Material Review Record
- LG DIV SQA FORM 5847 - MPS Submission Template
- LG-DIV-SQA-FORM 2963 - Vendor Initiated QN Notification Entry Sheet (Tag)
- LG-DIV-SQA-FORM 4486 - Vendor Initiated Quality Notification UPDATE Sheet
- LGPS 1000 - Corrosion Protection of Parts
- LGPS 1301 – Application of HVOF Thermal Coatings – Collins
- LGPS 7000 – Collins Grinding of Bare, High Strength, Low Alloy Steel

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- LGPS 7010 – Grinding and Finishing of HVOF Thermal Spray Coatings on High Strength Steel- Collins
- LGPS 8000 – Designated Part Controls
- LGPS 8002 – Boeing D6-1276 Delegated Approval Supplier Specification
- LS-LG-F014-ENG - Engineering Change Proposal Request (ECPR)
- LS-LG-W309-ENG - Engineering Change Requests
- LS-LG-W-426-ENG - Boeing Product - Digital Product Procedure
- LS-SBU-A001-SCM - Landing Systems Aerospace Supplier Packaging and Labeling Requirements
- LS-SBU-F001-SQA – Request for Processor Approval
- LS-SBU-F010-SQM - Landing Systems Supplier Quality Waiver
- LS-SBU-SPL-018 - MPS Submittal & Technique Process for Suppliers
- PFC-SC-025 DON - Supplier Quality Requirements
- 981-151-001 - Supplier Quality Assurance Requirements

3.3. Customer Specific Documents

- Airbus – ASR – Airbus Supplier Requirements & GRESS – General Requirements for Equipment and System
- Lockheed Martin Aeronautics Appendix QX
- Lockheed Martin Aeronautics PM-5010 - Supplier Shipping Instructions for Shipments to Buyer, Subcontractor, Or Buyer’s Non-U.S. Government Customers
- Transport Canada CAR 56
- Boeing D1-4426 – Approved Process Sources
- BAC 5440 – Application of Epoxy Polyamide Ablative Insulation Material
- BAC MFG. Control DWG 160T1000 – MFG Control REQMTS – Steel Parts HT-TR Above 200 KSI
- BAC 5008 – Application of Lubricants
- D581-25629-1 – Requirements for Die Forgings and Parts Made from Die Forging
- D-590 - Companywide Part Standards
- Boeing D6-1276 – Control of Designated Parts
- Boeing D6-51991 - Quality Assurance Standard for Digital Product Definition
- Boeing D8-0965 – Control for Fabricators of Critical Parts- Boeing
- Boeing D950-11059-1 - BDS Seller Special Tooling Requirements
- DPS 4.747 – Penetrant Inspection- Boeing
- DPS 4.804 – FABRICATION HIGH STRENGTH LOW ALLOY STEEL
- PS21201- Magnetic Particle Inspection
- PS21202 - Penetrant Inspection
- Sumitomo AQ1-11108 - Visual Inspection Procedure of Parts for MRJ program

3.4. Government Documents

- U.S. Customs regulation 19 CFR Part 134.11
- U.S. Code of Federal Regulations 14 CFR 21.307

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4. DEFINITIONS, ACRONYMS, & ABBREVIATIONS

- ASL – Approved Supplier List
- CAAC – Civil Aviation Administration of China
- DIR – Document Information Record
- DOC 200 – Collins LS Approved Special Processor List (ASPL)
- DQR – Delegated Quality Representative
- EASA - European Union Aviation Safety Agency
- FAA TSO – Federal Aviation Administration Technical Standard Orders. A TSO is a minimum performance standard for specified materials, parts, and appliances used on civil aircraft.
- FAIR – First Article Inspection Report, also referred to as FAI or First Article Inspection.
- M&PT – Materials and Process Technology.
- NDT – Non-Destructive Testing
- SCM - Supply Chain Management
- SDIR – Supplier Data Item Review
- SQM – Supplier Quality Management

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5. REQUIREMENTS

5.1. **Right of Access**

5.1.1 If contacted directly by LS customers or regulatory agencies, Suppliers **shall** notify Buyer and Buyer's Supplier Quality Representative for coordination of activities.

5.1.2 Failure to meet schedule, quality, or program requirements may cause long-term placement of Collins Aerospace personnel or designated representatives at the Supplier's facility.

5.1.3 Suppliers **shall** permit Collins LS access to data in OASIS and NADCAP databases including registration documentation, certification, audit reports, findings, corrective actions, etc. Collins LS reserves the right to input repetitive escape data and major audit findings regarding Suppliers' performance into the relevant OASIS or NADCAP database records for review by the Supplier's Registrar or Certification Body.

5.1.4 Regardless of Collins LS Customer Point of Acceptance on PO or whether Collins LS customer has issued a delegation for this PO, Supplier **shall** provide or obtain for Collins LS, Collins LS customers and regulatory agency personnel, access to any and all facilities where work is being performed or is scheduled to be performed, including those facilities of Supplier's agents and subcontractors, in order to perform product inspections, surveys or system / process surveillance as part of verification of conformance to the requirements of this PO. Supplier **shall** include the provisions of this facility access requirement in its POs with its Suppliers. Supplier **shall** provide suitable facilities at Supplier and Supplier's subcontractors' manufacturing locations for Collins LS, Collins LS customer and regulatory agency representatives to perform product inspections, surveys, or system / process surveillance.

5.2. **Material Substitutions**

5.2.1 Material substitutions **shall** not be allowed unless authorized by engineering drawing / model, material specification or supersession, or LS Material Review Board (MRB) disposition. This applies to but is not limited to:

- Material grade or stock (e.g., bar, rod, tube, extrusion, and flat)
- Material condition (e.g., heat treat)
- Material size (e.g., diameter, thickness)

5.3. **Clarification of Flow Down**

5.3.1 In the event there is a requirement listed herein that appears to conflict with any other requirement, the Supplier **shall** contact Buyer for clarification using ASQR-01 Form 3 for clarification.

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5.4. Documented Information and Record Retention

- 5.4.1 Suppliers **shall** retain the documented information necessary to provide evidence of contractual conformity and the effective operation the Supplier's QMS. Methods and records **shall** be made available for review by Buyer's representatives, customers, and regulatory authorities.
- 5.4.2 Suppliers **shall** maintain manufacturing records which provide traceability to all manufacturing, processing, servicing, and inspection operations. These records **shall** clearly indicate material status and acceptability. Manufacturing records will be kept for the life of the program plus 10 years minimum.
- 5.4.3 The Supplier and their sub-tier Suppliers **shall** have a defined process for control of records to ensure identification, storage, protection, retrieval, retention, disposition, and availability of the records.
- 5.4.4 Record retention **shall** be per applicable regulatory requirements (e.g., FAA TSO, CAAC, and EASA).

6. PRIOR TO PRODUCTION

6.1. Supplier Communication / Transfer of Information

- 6.1.1 Supplier **shall** notify LS via submission of ASQR-01 Form 3 upon any change in Suppliers' business that may potentially impact performance and or compliance (e.g., change in management, ownership, quality certification).
- 6.1.2 Tech Data Transfer - All technical or proprietary information, regardless of program, **shall** be transferred between LS and outside sources through the 3 following methods only:
- Net-Inspect
 - MOVEit
 - Encrypted WinZip email
- 6.1.3 LS has provided a document retrieval site within each Supplier's MOVEit account. It is the responsibility of each Supplier to ensure access and compliance to the current revision of documents. It is the responsibility of the Supplier to flow down the specific requirements including Collins Aerospace, LS, and customer requirements to their respective sub-tier Suppliers and processors.
- 6.1.4 LS provides periodic electronic notifications for drawing, specification, and manufacturing control drawing releases to all Suppliers with MOVEit accounts. It is incumbent on the Supplier to ensure they have access to this electronic notification.
- 6.1.5 Required LS SQM procedures, forms, and additional non-technical information can be found on the RTX Supplier Portal <https://Suppliers.utc.com/>.
- 6.1.6 Access to the standard flow down documents are as follows:

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- For COL-ASQR-PRO-0003, LS-SBU-A001-SQM, DOC 200, RTX Terms & Conditions: <https://portal.rockwellcollins.com/web/Suppliers/utc-Supplier-docs>
- For ASQR-01 referenced documents and related forms: <https://www.rtx.com/Suppliers/united-technologies-Suppliers/united-technologies-asqrd>

6.2. Engineering Data

- 6.2.1 Unless effectivity is specifically defined within a document's release, product **shall** be manufactured / processed to the process specification revisions and manufacturing control drawings in effect at the time of Purchase Order / Contract acceptance.
- 6.2.2 Suppliers are responsible for ensuring they have the current and / or latest drawing, specifications, and manufacturing control drawings per current purchase order(s) requirements.
- 6.2.3 Use of an obsolete drawing, specification, or manufacturing control drawing revision is not acceptable unless authorized on Purchase Order.

6.3. Using Model Based Definition (3-D Modeling)

- 6.3.1 The Model Based Definition **shall** be the governing authority in the Supplier's manufacturing, inspection, and all subsequent operations.
- 6.3.2 Suppliers **shall** flow down all required information to their sub-tier Supplier 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 Engineering for approval prior to processing.
- 6.3.3 In the case of CMM, laser, optical or other 3D electronic measuring equipment verification of part attributes from the Model Based Definition, the measuring equipment software **shall** be capable of properly interpreting the model without translation errors.
- 6.3.4 Where a Supplier does not have adequate 3D capability, the Supplier **shall** contact their Buyer using ASQR-01 Form 3 to ensure adequate design definition data is obtained.

6.4. Sub-tier Management

- 6.4.1 Suppliers are responsible for ensuring the use of approved suppliers for both LS and customer-directed suppliers.
- 6.4.2 The use of LS DOC 200 and / or customer authorized suppliers does not remove the requirement for the Supplier to ensure all product and process requirements are verified and validated.
- 6.4.3 Suppliers are responsible for ensuring the capability of their suppliers and the quality of all product and services provided. Subsequent Collins authorizations do not relieve the Supplier of its duty noted herein.

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6.5. Supplier Initiated Changes

6.5.1 Engineering Change Proposal Requests (ECPRs)

- 6.5.1.1. (*LG) Suppliers may request an engineering clarification by submitting a completed engineering change proposal request (ECPR) form LS-LG-F014-ENG. Instructions for completion and submittal of the ECPR, LS-LG-W309-ENG, is available on the supplier portal.
- 6.5.1.2. (*WB) Suppliers may request an engineering clarification by submitting a completed ASQR Form 2.
- 6.5.1.3. An accepted submittal is not acceptance to commence manufacturing until the design authority is formally changed to reflect the request. Suppliers **shall** follow an approved MRB disposition (e.g., (*LG) quality notification or (*WB) Form 815) process until the design authority is formally changed.

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7. DURING PRODUCTION

7.1. Handling, Storage and Preservation

7.1.1 *Electrostatic Discharge (ESD)*

7.1.1.1. Suppliers delivering Electrostatic 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.

7.1.2 *Protection of Sensitive Surfaces*

7.1.2.1. Machined parts with finished or semi-finished unprotected (not plated) surfaces **shall** be protected as per LGPS 1000 Corrosion Protection of Parts or applicable specifications.

7.1.3 *Threaded Items*

7.1.3.1. All threaded products **shall** have thread protection throughout all phases of product realization including shipment.

7.2. Identification: Part Marking and Serialization

7.2.1 Part marking and serialization **shall** be clearly identified in the manufacturing documentation for all parts.

7.2.1.1. All identification **shall** be applied prior to final inspection.

7.2.1.2. Suppliers **shall** have a process to ensure no duplication of serial numbers on any given part number regardless of revision or configuration changes.

7.2.1.3. If products are of opposite configuration, left and right-handed product, the same serial number **shall** not be used on both opposing hand configurations.

7.2.1.4. Suppliers **shall** maintain a serialization record for each serialized component manufactured. Identification and traceability are required for all product and material, per design requirements.

7.2.1.5. Serial numbers **shall** comply with drawing and / or specification requirements.

7.2.1.6. When serialization is required by design requirements, applicable serial numbers **shall** be identified on all Supplier and Supplier's sub-tier quality, inspection, and manufacturing records (e.g., travelers and process certifications).

- Serialization required by design requirements **shall** include a prefix.
- Prefix codes will be assigned by LS SQM.

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

Forging: P1234 Finished: XYZ1234

- 7.2.1.7. Suppliers of the detail items shall provide cross-reference traceability to the original forging, casting, swaging, and raw material forging serial numbers if new serial numbers are assigned.
- 7.2.1.8. The Supplier **shall** identify the serial number of the forging used for the resultant part on the appropriate quality and shipping documents.
- 7.2.1.9. Identify product with the appropriate design activity code per the engineering drawing / model requirements.
- 7.2.1.10. The LS manufacturer’s identification codes are as follows:
 - Oakville, Canada MFR02121
 - Fort Worth, Texas MFR6K4C8
 - Troy, Ohio MFR97153
- 7.2.1.11. Supplier manufacturing codes **shall** not be used unless specifically called out on the released engineering, drawing, and / or part marking specification.
- 7.2.1.12. Application of drawing / model revision letters on product is only allowed when required by purchase order, engineering drawing / model or specification.
- 7.2.1.13. “Kits” **shall** have the following identified in a conspicuous location:
 - Each detail item **shall** be identified per applicable requirements of engineering drawing / model, specifications, and this document.
 - Quality acceptance approval of the kit.
 - Assigned kit part number and revision level.
 - 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.

7.3. Product Qualification Process Requirements for Forgings, Castings and Swagings

- 7.3.1 Product Qualification process **shall** be performed prior to beginning production.
- 7.3.2 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 approval prior to beginning production.

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- 7.3.3 Required elements as part of the product qualification process are as follows:
- 7.3.3.1. Description of each process and operation applicable to the parts, including heat treat racking or loading information (sketch or photograph preferred).
 - 7.3.3.2. Thermal treatments, including “set” temperatures and times.
 - 7.3.3.3. 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:
 - Two sets (one for LS and one for Supplier) of original photographs of microsections (at least 1X magnification that are not photocopies). Grain flow **shall** follow the general part contour with no re-entrant grain flow lines.
 - Microstructural verification including decarburization / carburization test results.
 - Chemical analysis report.
 - Mechanical properties test report.
 - Hardness test results.
 - Nondestructive test results.
 - Dimensional layout report.
 - The raw material certifications from which the product qualification part was manufactured.
 - All certifications for any outside special processing and testing.
 - Copies of each LS closed rejection reports (QNs) covering non-conformances that exist on the product qualification part, as applicable.
 - Nondestructive testing (NDT) techniques.
 - Nondestructive testing (NDT) procedures and techniques **shall** be authorized by the applicable certified Level III.
 - 7.3.3.4. When the engineering drawing / model requires product qualification report submittal to the LS customer, two copies of the product qualification report with original grain flow photographs (when required) **shall** be submitted.
 - 7.3.3.5. For handed Forgings, Castings, and Swaging (left or right) only one product qualification approval **shall** be required, provided the opposite hand process is identical.
- 7.3.4 For questions or clarification of the above, Supplier may contact Collins Materials and Process Technology (M&PT).
- 7.3.5 Follow LS-SBU-SPL-018 Manufacturing Planning /Metallurgical Qualification Submissions Process locate here: <https://portal.rockwellcollins.com/web/Suppliers/utc-Supplier-docs>
- 7.4. Forgings, Castings, Swagings, & Raw Material**
- 7.4.1 All forgings, castings and swagings **shall** be identified with a vendor code or logo, which **shall** be specific to that Supplier and / or per drawing requirements.

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- 7.4.2 Suppliers **shall** maintain traceability from the raw material manufacturer's heat or lot numbers to each individual forging, casting, or swaging. Heat or lot numbers **shall** be noted on Supplier's Certification of Conformance.
- 7.4.3 All bar stock material (each piece) **shall** be identified with the heat or lot number, purchase order number, or color code as appropriate.
- 7.4.4 Material traceability (heat or lot) **shall** be transferred to the unused bar stock prior to storage.
- 7.4.5 Suppliers **shall** develop, document, and implement a raw material verification process to ensure material(s) received from the Supplier's sub-tier sources meets all the applicable technical and quality requirements.
 - 7.4.5.1. Suppliers **shall** annually select a sample of each material type per material Supplier (e.g., carbon steel, alloy steel, stainless steel, aluminum, etc.) and have it independently tested at an accredited ISO / IEC 17025 laboratory for material composition and chemistry to verify compliance with applicable engineering requirements.
 - 7.4.5.2. Test reports provided upon original material delivery may not be used as proof of compliance; this is intended as a third-party validation.
- 7.4.6 Raw material Suppliers to LS and to LS Suppliers **shall** have a process control methodology in place for identifying, tracking, and trending the following key characteristics:
 - Ultimate Tensile Strength (UTS)
 - Yield Strength (YS)
 - Elongation
 - Reduction of Area (RoA)
- 7.4.7 Results and actions taken **shall** be made available upon request to LS or LS Suppliers.

7.5. Manufacturing Planning Documents

7.5.1 Plans and Techniques

- 7.5.1.1. Suppliers **shall** generate and control manufacturing plans for all individual components and assemblies.
- 7.5.1.2. The planning **shall** include all engineering data references (specification, flag note, etc.) necessary to control and produce the parts and include all the machining, processing, testing, 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.

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- 7.5.1.3. Coolants used per specification controls must be identified, in compliance, and documented on the submitted plan, when required (e.g., BAC MFG. control DWG 160T1000 high strength steel, note 3, BAC 5440, BAC5008 (applicable table indicates approved coolants)).
- 7.5.1.4. Developmental aids, including a manufacturing plan template and other similar information are available from LS upon request.
- 7.5.1.5. Supplier is responsible to review and approve all manufacturing and process plans associated with the LS purchase order, including those of its sub-tiers affiliated with LS product realization.
- 7.5.1.6. The manufacturing plan(s) **shall** be retained on file at the Supplier's or sub-tier's manufacturing facilities, when applicable, and **shall** be available upon request by LS.
- 7.5.1.7. The plan documentation **shall** be available in English and include the following details, as a minimum:
- Name of applicable manufacturer with facility address.
 - 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.
 - Engineering drawing / model revision level.
 - Planning revision table including revision dates, 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.
 - Raw material (including forging part number if applicable), raw material specification, raw material size, and heat treat condition.
 - All operations **shall** be noted in their proper manufacturing sequence, including all inspection and test points. 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 within the applicable operation / inspection record.
 - Part identification description including method and text.
 - Operations that are required to be performed per a particular specification **shall** list that specification as part of the operation description in the planning.
 - Special process operations **shall** list the name and location of the processor, the applicable specification(s) and revision(s), as well as the necessary certifying information (e.g., Types, Class, Method, Grade, etc.).
 - Special processes sources **shall** be approved on DOC 200, as well as customer approved processor listings as required. Evidence of verification and validation activities for externally provided services.
- 7.5.1.8. Maximum section thickness at time of heat treat **shall** be noted.

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- 7.5.1.9. All thermal processing operations **shall** be listed independently (e.g., embrittlement relief, stress relief, etc.) All required times, conditional delay requirements and temperatures **shall** be documented.
- 7.5.1.10. Nonconventional machining techniques which impart significant localized heating (e.g., EDM, ECM, plasma application, and laser use) **shall** only be used when authorized by engineering requirements or MRB disposition.
- 7.5.1.11. 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. Supplier **shall** have a process to control the frequency, documentation, and adequacy of the reviews.
- 7.5.1.12. All NDT techniques **shall** be approved by a recognized NDT Level III authority.

7.5.2 **Manufacturing Process Sheet (MPS) Review and Approval**

- 7.5.2.1. Manufacturing Process Sheet (MPS) requiring LS approval **shall** be submitted and approved by LS prior to start of manufacturing.
- 7.5.2.2. Unless otherwise specified, the following specifications and part designations require MPS and processing technique submission for LS review and approval when invoked on purchase order, engineering, or contractual requirements.
 - Minimum ultimate tensile strength (UTS) 180 KSI (HRC 40) and above, except springs and bushings.
 - “Flight safety”, “Mission”, “Mission / Safety Critical”, “Safety of Flight”, or “Fracture Critical Traceable”, “Fatigue Critical”, “Maintenance Critical”, “Fracture Critical”, etc.
 - CPC6400 – UTAS (Goodrich) Shot Peen
 - D581-25629-1 – Requirements for Die Forgings and Parts Made from Die Forging – Boeing
 - D6-1276 – Boeing
 - Plans / techniques for D6-1276 designated parts must also comply with Collins LGPS 8002
 - D8-0965 – Control for Fabricators of Critical Parts- Boeing
 - DPS 4.804 – FABRICATION HIGH STRENGTH LOW ALLOY STEEL - Boeing
 - Material certificates **shall** be provided for DPS 4.804 plans.
 - DPS 4.747 – Penetrant Inspection- Boeing
 - PS21201 Boeing document for F18 and F15 parts noted as “Maintenance Critical”, “Fracture Critical”, “Safety of Flight”, or “Fracture Critical Traceable”
 - LGPS 1301 – Application of HVOF Thermal Coatings – Collins
 - LGPS 7000 – Collins Grinding of Bare, High Strength, Low Alloy Steel
 - LGPS 7010 – Grinding and Finishing of HVOF Thermal Spray Coatings on High Strength Steel- Collins
 - LGPS 8000 – Fabrication of Designated Parts – Collins
 - LGPS 8002 – Delegated Approval Supplier Specification – Collins
 - Welding

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7.5.2.3. Where any of the following special processes are used in planning that is required to be submitted to LS for review (see above), processing techniques **shall** be submitted as a portion of the manufacturing planning submittal:

- Chrome grind
- Heat treat, including straightening (if applicable)
- HVOF
- HVOF grind
- Belt grind (Chrome / HVOF)
- Shot peen
- Welding
- NDT techniques requiring approval per DPS 4.747. Techniques **shall** be approved by an authorized NDT Level III for the corresponding NDT method.
 - In accordance with PS21201 or PS21202 for F18 and F15 parts noted as “Maintenance Critical”, “Fracture Critical”, “Safety of Flight”, or “Fracture Critical Traceable”, **shall** be appropriately designated.

7.5.3 **MPS Approval Submission**

7.5.3.1. Follow LS-SBU-SPL-018 Manufacturing Planning /Metallurgical Qualification Submissions Process located here:

<https://portal.rockwellcollins.com/web/Suppliers/utc-Supplier-docs>

7.5.3.2. 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).

7.5.3.3. The planning **shall** include the minimum engineering data references (specification, flag note, etc.) necessary to control and produce the parts including all the machining, processing, planned rework, 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.

7.5.3.4. All plans **shall** be reviewed and approved by the Tier 1 holder of the LS purchase order prior to submission to LS.

7.5.3.5. Planning **shall** only be submitted to LS from the Tier 1 holder of the LS purchase order. Supplier’s sub-tiers **shall** not submit planning documentation directly to LS.

7.5.3.6. Suppliers and their sub-tiers **shall** retain all applicable MPS and supporting documentation per LS retention requirements. MPS and associated documentation **shall** be made available upon request by LS and / or its customers.

7.5.3.7. Manufacturing plans submitted for LS review and approval **shall** be complete and officially ‘released’ by the Supplier and consistent with the requirements of Manufacturing planning documents herein. Any subsequent changes (including, but not limited to the addition, removal, or modification of notes, operations, processing

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parameters, sequencing, etc.) require the Supplier to roll-up the revision level and document these changes within the revision table. This requirement is applicable to all controlled process instructions.

7.5.3.8. Planning **shall** be revised as applicable, and revisions documented until fully approved by LS.

7.5.4 **Post MPS Approval**

7.5.4.1. Collins LS will communicate the results of the manufacturing plan review back to the source(s) thru MOVEit.

7.5.4.2. The Supplier **shall** retain evidence of planning approval status for all past and current revisions.

7.5.4.3. Once planning is approved by LS it **shall** be considered frozen. Any changes to approved planning **shall** be resubmitted for review and approval.

7.5.4.4. All changes to planning, including editorial changes, **shall** be documented in a revision table as defined herein.

7.5.4.5. ALLOWED CHANGES (unless controlled by specification or Customer):

The following are allowed changes to an approved MPS and do not require Landing Systems M&PT and QA approval:

- Editorial changes
- Clarification of existing instructions
- Documentation of changes to drawing revision level for parts
- Typographical errors
- Unplanned rework which meets all the following:
 - Rework not in violation of any specific provisions of the manufacturing plan
 - Is in accordance with the applicable process specification
 - Does not result in any change to sequence of special processes
 - Does not adversely affect the final product quality and integrity
- Rerouting (offloading, sub-contracting) activity that does not involve the following:
 - Heat treatment / Stress relieving
 - Shot or glass bead peening
 - NDI, including magnetic particle inspection, ultrasonic inspection, and x-ray inspection, proof load testing
 - Plating processes
 - Thermal spray coatings
 - Welding
 - Grinding of Chromium plating
 - Grinding and superfinishing of HVOF coatings

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7.6. Straightening of Steel Parts

- 7.6.1 Unless specifically permitted by the engineering drawing and / or its applicable supporting specifications, authorization by LS Material Review Board (MRB) and / or Materials & Process Technology (M&PT) is required before performing straightening on steel parts heat treated to tensile strengths greater than 150 KSI.
- 7.6.2 The Supplier **shall** maintain all necessary documentation and data records for each part straightened and will be made available to customer upon request.
- 7.6.3 Straightening of steel parts, regardless of temperature, by means of plastic deformation which results in a modified dimensional condition is prohibited.

7.7. Special Processes

- 7.7.1 Nadcap accreditation is required for processors of Nadcap commodities as recognized by the Performance Review Institute (PRI). Buyer's approved special processors are listed on DOC 200 found here:
<https://utcaerospacesystems.com/Supplier-documents/>
- 7.7.2 DOC 200 is the LS listing of approved processors available. When new processors are approved by LS but not yet added to DOC 200, an email from LS Supplier Quality Management suffices as evidence of approval until DOC 200 is revised.
- 7.7.3 **Approval of Special Processors (DOC 200)**
 - 7.7.3.1. The request **shall** be made in writing to Supply Chain Management using form LS-SBU-F001-SQA – Request for Processor Approval, (available upon request) stating the processor's company information and listing the process(es), specification(s) and justification for the Supplier's request for processor approval. Supplier is responsible for accurate completion of the form and should not be completed by the processor.
 - 7.7.3.2. Approvals are granted for each individual processor / process / specification combination and are site location specific. Physical relocation of processing requires LS re-approval prior to any use of that re-located process.
 - 7.7.3.3. Special process sources approved for a LS, Military or Industrial specification that have been superseded, **shall** be considered approved for the superseding specification.
- 7.7.4 **Suppliers use of Approved Processors**
 - 7.7.4.1. Supplier's utilization of Collins LS approved or Nadcap accredited sources does not relieve the Supplier from the obligations to ensure subcontracted sources are in full compliance with applicable process specifications and to deliver conforming items.

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- 7.7.4.2. When product is required to be processed to a LS customer-controlled specification (e.g., Boeing BACxxxx, DPSx.xx, PSxxxxx, Lockheed 5PTPxxx, etc.), the selected process source **shall** be approved on the LS customer's Approved Supplier List (e.g., Boeing D1-4426, Lockheed QCS-001, etc.) and within LS DOC 200 for the following:
- Aerospace accredited quality system (AS9100, AC 7004)
 - Equivalent / comparable industry special process specification relative to the LS customer's specification(s).
- 7.7.4.3. The Supplier's purchase order **shall** flow down to the processor the information to meet all applicable contractual, engineering, specification, and customer requirements.
- At a minimum, the purchase order **shall** clearly specify the following:
 - Full scope of processing to be performed
 - MRB actions required
 - Applicable specification number(s), revision(s), addendum(s) or modifications
 - Part numbers, quantity, serial numbers (if applicable)
 - Applicable program, prime customer
 - Identify LS as the Supplier's direct customer
- 7.7.4.4. Collins may periodically request each Supplier to identify and report the special processors used for LS product. Such report **shall** be completed in the format and timeline as requested by LS. Collins may request any of the following information but not limited to:
- Processor Name
 - Specification used
 - Qty processed

7.7.5 **Processor Requirements**

- 7.7.5.1. Unless allowed by LS specification requirements, for serialized parts, heat treat sources **shall** record actual hardness values for each serial number. Parts **shall** be serialized prior to heat treat operations.
- 7.7.5.2. Suppliers and Processors **shall** have established performance metrics for internal rework associated with each approved special process and **shall** make this information available upon request.
- 7.7.5.3. If a discrepancy is discovered within a special process, see the MRB Process noted herein.

7.8. **Special Inspection Requirements / Techniques**

7.8.1 **Thread Inspection**

- 7.8.1.1. 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):

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- 7.8.1.2. Visual Inspection of threads per ANSI / ASME B1.3, paragraph 6c.
- 7.8.1.3. 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 as applicable to design requirements.
- 7.8.1.4. Major diameter size measurement per ANSI / ASME B1.3, Column J2, of Table 1, external threads only.
- 7.8.1.5. Pitch diameter size measurement per ANSI / ASME B1.3, Column C2, of Table 1 or Table 2 as applicable.
- 7.8.1.6. Minor diameter size measurement per ANSI / ASME B1.3, Column K2, of Table 1 or Table 2 as applicable.
- 7.8.1.7. Root radius size measurement per ANSI / ASME B1.3, Column L, of Table 1, external threads only.

Note: It is recommended that those Suppliers that manufacture class #3 series internal and external threads shift their process means toward minimum material condition.
- 7.8.1.8. 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.
- 7.8.1.9. In the event of a thread attribute gauge dispute between facilities (e.g., Suppliers and LS site gauges that accept and reject the same parts); the NIST calibration certification provided by the Supplier from an ISO / IEC 17025 accredited lab **shall** be the determining 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 / IEC 17025 accredited facility or higher on the NIST hierarchy.

7.8.2 **Spline Inspection**

- 7.8.2.1. 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.

7.8.3 **Workmanship**

- 7.8.3.1. All product shipped to LS **shall** be in new condition, free from imperfections (hidden or seen), and compliant to all stated requirements unless otherwise stated by purchase order / contract or other LS approved communication.
- 7.8.3.2. LS SQM and the Supplier may mutually define workmanship criteria, as applicable.

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7.9. Sampling Inspection

- 7.9.1 100% inspection and recording of results for final acceptance features of all parts shipped to LS is expected unless otherwise noted.
- 7.9.2 Sampling plans **shall** be documented on ASQR-01 Form 3: Supplier Request for Information and submitted via MOVEit for approval.
- 7.9.3 Sampling plans must be approved by Buyer's Supplier Quality Representative prior to implementation / use.
- 7.9.4 Sampling inspection performed by the Supplier on final acceptance features **shall** be in accordance with AS9138.

7.10. First Article Inspection

7.10.1 General

- 7.10.1.1. Suppliers **shall** use Net-Inspect to generate and submit FAIRs.
 - DISCUS is available free of charge to Suppliers for characteristic identification.
 - All previously approved FAIs which are still current and not in Net-Inspect **shall** be uploaded to Net-Inspect prior to shipment to LS.
- 7.10.1.2. Unless otherwise contractually agreed to, Supplier **shall** comply with the latest revision of AS9102 at the time of PO acceptance, in alignment with industry permitted timeline for implementation when revisions are deployed.
- 7.10.1.3. First Article Inspection Reports (FAIR) **shall** be performed in accordance with AS9102 and the additional requirements stated herein.
- 7.10.1.4. In addition to requirements outlined in AS9102, a partial FAI **shall** be performed when transferring to a new processor or sub-tier.
- 7.10.1.5. All FAIRs regardless of Design Responsibility, **shall** be made available to Buyer's Supplier Quality Representative upon request.
- 7.10.1.6. If export control regulations prevent technical data from being shared in Net Inspect, MOVEit **shall** be used for FAI submission.
- 7.10.1.7. For forgings, castings, and swagings, LS Manufacturing and Process Technology (M&PT) Product Qualification Process Approval **shall** be included with the FAI package.
- 7.10.1.8. Buyer's Supplier Quality Representative may elect to review or participate in the Supplier's FAI process at any time and may require in-process and or final FAI validation hold points or FAI approval prior to shipment to Collins LS (including an onsite review at the Supplier).

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- **First Article Inspection review by Collins LS will typically be scheduled within 5 days of notice received if onsite review is required.**
- 7.10.1.9. Buyer reserves the right to require the Supplier to perform a partial or full FAI for causes defined in AS9102 or for any reason causing the Buyer to believe the current production process lacks traceability to previously performed FAIs.
- 7.10.1.10. For questions / interpretation of AS9102, Supplier should first consult the Supply Chain Management Handbook published by IAQG and available online as public information at <https://iaqg.org/>.
- 7.10.2 ***FAI Planning Activities***
- 7.10.2.1. Suppliers are expected to comply with the FAI planning requirements denoted in AS9102. As an output of FAI planning activity, Suppliers **shall** initiate the FAI process.
- 7.10.2.2. Where Collins LS identifies a need for an FAI, the Supplier **shall** be notified via a FAIR Requirement request in Net-Inspect.
- 7.10.2.3. Prior to production, Suppliers **shall** complete their FAI Planning process in Net-Inspect in accordance with Table 1 and notify Buyer’s Supplier Quality Representative for review.
- 7.10.2.4. Suppliers **shall** ensure all FAIs are readily available to support the revision of product being delivered.
- 7.10.3 ***Design Responsible Supplier FAI Requirements***
- 7.10.3.1. First Article Inspection Reports (FAIR) **shall** be performed in accordance with AS9102.
- 7.10.3.2. FAIRs **shall** be performed on each level of the Technical Data Package (e.g., Collins Envelope Drawing, Supplier Design Drawing, etc).
- 7.10.4 ***FAI Process Fulfillment***
- 7.10.4.1. The instructions provided herein are applicable to all FAIs (First Article Inspections) performed by all Suppliers for Collins LS regardless of design authority or media (e.g., 2D, 3D DPD dataset, mylars, tabulated drawings, coordinate drawings, etc.).
- 7.10.4.2. FAIs for kits and assemblies **shall** be completed as an “assembly” with the individual items listed on Form 1. For details, subcomponents and drawings referenced on the assembly drawing / DPD, the following is required:
- Complete FAI for detail part number(s).
 - If the Supplier manufactures detail(s) that have a different base part number than the FAI part, then a separate, full FAI is required on the detail(s).
 - Casting and Forging FAIs must have evidence of both a Collins LS approved dimensional and metallurgical FAIR Form 1. If Collins LS provides the Casting or forging, Collins LS **shall** also provide evidence of the approved FAIR Form 1.

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- Casting and forgings are considered detail parts to the next level machining and **shall** be listed as details on FAIR Form 1.
- When machining a casting / forging that has no other details, the casting / forging is considered a detail.

7.10.4.3. All fields **shall** be filled out with the information required in Table 1.

Note – Table 1 was written to align to AS9102C and Net-Inspect. AS9102C forms are released on the IAQG Forms page found here: <https://iaqq.org/standards/forms/>

7.10.4.4. Interpret Table 1 as follows:

- **[R]** - Required: This is mandatory information.
- **[CR]** Conditionally Required - This field **shall** be completed when applicable to the product (e.g., serial number **shall** be entered when there is a serial number) or when required by the customer, otherwise may be left blank.
- **[O]** Optional - This field is provided for convenience; the field may be left blank.

Table 1 – FAI Field by Field Requirements

FAI PLAN	FIELD #	COMPLETION INSTRUCTIONS
[R]	FIELD 1 [R]	PER AS9102
[R]	FIELD 2 [R]	PER AS9102
	FIELD 3 [CR]	PER AS9102
	FIELD 4 [R]	PER AS9102
[R]	FIELD 5 [R]	Enter the revision as stated on the purchase order line item. When applicable, use the DIR revision(s) for lower-level part numbers (*LG).
[R]	FIELD 6 [R]	Enter the drawing number. If the Drawing Number is different than the Part Number entered in Field 1, use the Drawing Number. (Example: Part Number is: 123456-789, Drawing Number is: 123456; enter: 123456 in Field 6).
[R]	FIELD 7 [R]	Enter the revision of the drawing entered in Field 6.
	FIELD 8 [CR]	PER AS9102
[R]	FIELD 9 [R]	PER AS9102
[R]	FIELD 10 [R]	PER AS9102
[R]	FIELD 11 [R]	PER AS9102
[R]	FIELD 12 [R]	PER AS9102
[R]	FIELD 13 [R]	PER AS9102
[R]	FIELD 14 [R]	PER AS9102
[CR]	BASELINE [CR]	PER AS9102
[CR]	REASON [CR]	PER AS9102
[CR]	FIELD 15 [CR]	PER AS9102
[CR]	FIELD 16 [CR]	PER AS9102
[CR]	FIELD 17 [CR]	PER AS9102
[CR]	FIELD 18 [CR]	For COTS details, enter a certification traceability number. If details were supplied by Collins LS, enter the Shipping

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FAI PLAN	FIELD #	COMPLETION INSTRUCTIONS
		Authorization or Customs Invoice (or other Collins LS Supplier shipping documentation) number. If the subcomponent has any QN's associated, record the QN number as well.
	FIELD 19 [R]	PER AS9102
	FIELD 20 [R]	PER AS9102
	FIELD 21 [R]	PER AS9102
	FIELD 22 [R]	PER AS9102
	FIELD 23 [CR]	PER AS9102
	FIELD 24 [CR]	PER AS9102
	FIELD 25 [CR]	PER AS9102
	FIELD 26 [O]	PER AS9102
Form 2		
[R]	FIELD 1 [R]	PER AS9102
[R]	FIELD 2 [R]	PER AS9102
	FIELD 3 [CR]	PER AS9102
	FIELD 4 [R]	PER AS9102
[CR]	FIELD 5 [R]	If processes are performed multiple times (e.g., 2x MPI), each occurrence shall be listed in separate rows with all information included. When multiple items appear in the same note they must be separated out.
[CR]	FIELD 6 [R]	If listed in the engineering, include the applicable type, class, grade, etc.
[CR]	FIELD 7 [CR]	Enter any required code from the end Customer for material or process listing, when required. (e.g., BAC 5019 is Boeing Process Code "304"). These are not the Collins LS DOC 200 Codes.
[CR]	FIELD 8 [R]	For Collins LS defined special processes, enter the Collins LS assigned Processor Number as found in Collins LS Document 200 Column A. Enter the complete and full Supplier name and address, including city, state, zip, etc., furnishing raw material or performing the special process. If material is purchased through distribution, also enter the distributor's information.
[CR]	FIELD 9 [R]	PER AS9102
	FIELD 10 [R]	Enter the raw material heat / lot number, certification number, Lab Test Report number, Manufacturing Traveler number (with attached verification, including operation number for each in-house performed process), or Shipping Authorization or Customs Invoice Number (or other Collins LS supplied shipping documentation if supplied by Collins LS). If the Supplier is approved to perform the special process in house and does not generate a CoC, they can provide a copy of the traveler showing the special process

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FAI PLAN	FIELD #	COMPLETION INSTRUCTIONS
		operation. The traveler / process sheet must match the design authority requirements including revision of the specification.
[CR]	FIELD 11 [CR]	PER AS9102
	FIELD 12 [CR]	PER AS9102
	FIELD 13 [O]	PER AS9102
Form 3		
[R]	FIELD 1 [R]	PER AS9102
[R]	FIELD 2 [R]	PER AS9102
	FIELD 3 [CR]	PER AS9102
[R]	FIELD 4 [R]	PER AS9102
[R]	FIELD 5 [R]	Multiple design characteristics within a note shall have a unique identifier assigned for each characteristic. Sub-balloons will be individually listed and accounted for on Form 3. Each characteristic within the note needs to be ballooned and accounted for separately (e.g., material, stock thickness, hardness, heat treat, etc.). Each is a unique design requirement and therefore requires individual results to be recorded. A copy of ballooned sections of applicable specifications shall also be included. For DPD controlled parts or assemblies, the Supplier shall balloon all captures as provided within the design authority model along with manufacturing data and include a screenshot of the model revision.
[CR]	FIELD 6 [R]	Enter the drawing sheet# and zone# (e.g., SH1 ZN A1) or document page number (e.g., 1100K9100 PG 2, EO PG 3) of the ballooned characteristic. For MBD, use the capture name (e.g., "Front View").
[CR]	FIELD 7 [CR]	PER AS9102
[R]	FIELD 8 [R]	PER AS9102
	FIELD 9 [R]	PER AS9102
	FIELD 10 [CR]	PER AS9102
	FIELD 11 [CR]	PER AS9102
	FIELD 12 [O]	PER AS9102
	FIELD 13 [R]	PER AS9102
	FIELD 14 [R]	Describe the inspection equipment (e.g., caliper, micrometer, scale, etc.) and the traceability identification (e.g., MIC # 123, Caliper# 456, Scale# 789, etc.) for the inspection equipment used for the product acceptance. For informational drawing notes with no measurable characteristics, enter "Information" and / or "Visual", as applicable. Also enter the identification (initials, stamp, etc.)

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FAI PLAN	FIELD #	COMPLETION INSTRUCTIONS
		of each inspector responsible for each result recorded in Field 9.
Attachments / Objective Evidence		
[R]	Collins PO [R]	Collins LS purchase order – minimum page 1 & page(s) showing line item and revision.
[CR]	DIR (*LG) [CR]	DIR(s) applicable at time of PO acceptance. Assembly DIR(s) shall show all lower-level DIRs.
[CR]	Customer Engineering [CR]	Ballooned engineering – drawing(s), parts list(s), model(s), control drawing(s), specifications, etc.
[CR]	Supplier Engineering [CR]	Source control or proprietary engineering and evidence of approval or review from Collins LS.
[CR]	MPS Memo(s) (*LG) [CR]	MPS approval memos approved by Collins
[CR]	Test Procedure(s) [CR]	Copy of Acceptance Test Plans / Procedure(s) approved by Collins LS.
	Material [CR]	Material certs for all raw material(s).
	Hardware [CR]	C of C for all fasteners and standard hardware (COTS).
	Processes [CR]	C of C for all special processes with revision(s) used.
	Sealants [CR]	C of C for all sealant, grease, torque seal, etc.
	Finishes [CR]	Material certs from manufacture(s) of all primer, paint, finishes, etc.
	Finish Application [CR]	C of C for application of primer, paint, finishes, etc.
	BAC 5008 [CR]	C of C for BAC 5008 approved fluids / coolants used.
	Test Report(s) [CR]	Copy of completed and accepted Acceptance Test Report(s).
	Stress Memo(s) (*LG) [CR]	Copy of stress engineering memo(s) approved by Collins LS.
	QNs / MRBs [CR]	Any / all QNs / MRBs associated with FAI part.
	ECPR(s) (*LG) [CR]	Any / all ECPRs associated with FAI part.
	Product Photos [R]	Color photo(s) of overall part showing all sides / views.
	Part Marking [R]	Color photo(s) of all part identification, including serial number.
	Metallurgical Reports [CR]	Results of all metallurgical and quality evaluations for Forgings, Castings and Swagings.
	Qualification Testing [CR]	Evidence of Collins LS Engineering approved qualification test plan(s).

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7.11. Nonconforming Product

- 7.11.1 Suppliers **shall** not ship nonconforming material unless authorized in writing by MRB disposition.
- 7.11.2 (*LG) The MRB disposition or LS-LG-F001-QA, Request for Custody form **shall** be uploaded as objective evidence within Net-Inspect eSource.
- 7.11.3 For a discrepancy discovered that may be reworked into a conforming condition prior to subsequent manufacturing, the Supplier's standard internal rework process **shall** be followed. Rework records **shall** be maintained as per the Records of Manufacturing.
- 7.11.3.1. Unless specifically authorized by the engineering drawing / specifications or LS MRB disposition, welding on any LS assemblies or machined / formed detail components for the purpose of repair is prohibited.
- 7.11.4 For a discrepancy discovered within a special process, the guiding specification for that specific special process may provide rework guidelines. If guidance is not provided in the specification, LS must approve any rework through the MRB process.
- 7.11.5 The use of special processes not specified on the applicable engineering drawings is not permitted unless authorized by LS.

7.12. Obtaining an MRB Determination

7.12.1 (*WB) MRB submission

- 7.12.1.1. Supplier **shall** submit a completed Supplier Material Review Record (Form 815) to the Buyer's Supplier Quality Representative.
- 7.12.1.2. Product which has been accepted by MRB **shall** be identified per the instructions provided on Form 815.
- 7.12.1.3. Shipment for material associated with an MRB **shall** be identified per MRB instructions. All material certifications for MRB approved material **shall** reference the appropriate MRB number.
 - Approval must be granted by Wheels and Brakes prior to product shipment.
 - Approval for shipment does not establish any precedent for future non-conforming material.
- 7.12.1.4. The Supplier must retain a copy of the dispositioned Supplier Material Review Record (Form 815) with their quality records for the affected material.

7.12.2 (*LG) Quality Notification (QN) submission

- 7.12.2.1. Suppliers **shall** document the discrepancy on a LS Quality Notification (QN) form LG-DIV-SQA-FORM 2963:

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- See naming convention requirements for QN submission in are refenced in the Form (See LS-SBU-SQM-SPL-001).
 - **Shall** contain a clear description of actual or suspect nonconformance(s).
- 7.12.2.2. When completing the LG-DIV-SQA-FORM 2963, the requestor **shall** complete all fields on form in its entirety prior to submission. The QN number will be communicated back to the Supplier when request is accepted.
- 7.12.2.3. Once disposition is obtained from LG MRB, each element of the disposition **shall** be stamped off and dated as evidence of completion.
- 7.12.2.4. Subsequent requests by LG for reconvene or continuation to obtain final MRB disposition **shall** be on LG-DIV-SQA-FORM 4486.
- 7.12.2.5. If any special processes are used in conjunction with the MRB decision, the Supplier **shall** list the processor used, specification performed, the certification number, and date.

7.13. MRB Administrative Costs

- 7.13.1 Suppliers are responsible for all administrative costs and Customer penalties incurred by LS including the Material Review (MR) related to disposition of Supplier provided nonconforming product.
- 7.13.2 Any costs associated with rework of discrepant material may be charged to the Supplier.

8. PRODUCT ACCEPTANCE

8.1. Final Inspection

- 8.1.1 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 prior to DQR or Collins review.
- 8.1.2 (*WB) The Supplier verification **shall** note acceptance of each shipment by stamping and dating the "Certification of Conformance" and the Supplier's packing list / shipper.
- 8.1.3 (*LG) The DQR verification **shall** be separate and independent from the Supplier's final inspection process.
- 8.1.4 (*LG) The DQR **shall** note acceptance of each shipment by stamping and dating each record reviewed, the Supplier's "Certification of Conformance" and packing list / shipper by using the LS supplied DQR acceptance stamp.
- 8.1.5 (*LG) Use of the DQR stamps by any other person than the assigned DQR will be cause for loss of qualification. DQR stamps are to be returned to LG when any of the following occurs:

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- Assigned DQR leaves the Supplier or changes job role at the Supplier that would preclude the DQR from performing the required DQR duties.
- DQR authority is revoked by LG.

8.2. Source Inspection

- 8.2.1 All product is subject to Buyer's Supplier Quality Representative acceptance at Source and or review or inspection, at any time, regardless of DQR authority.
- 8.2.2 (*WB) Supplier's performance will determine the need for onsite Source activities by Buyer's Supplier Quality Representative or 3rd party representative. Suppliers are responsible for all costs associated with having their product verified prior to being received by Collins.
- 8.2.3 (*LG) Supplier Quality verification for all product(s) and / or service(s) purchased by LG **shall** be performed at the Supplier's facility prior to shipment to a LG facility / site. The assigned Supplier Quality representative can waive the onsite verification.
- 8.2.3.1. (*LG) For Supplier's with DQR authority, the Supplier's authorized DQR is performing this Source inspection on behalf of Buyer's Supplier Quality Representative or 3rd party representative.
- 8.2.4 (*LG) Supplier of Raw Material (Plate, Bar, Tube etc...) and or Special Processes (chrome, heat treat etc...) who supply material or services directly to LG sites are not required to have source inspection performed by LG DQR or third-party inspector.
- 8.2.5 (*LG) Waivers for change of source location **shall** be documented using LS-SBU-F010-SQM.
- 8.2.5.1. The Supplier's LS SQM focal **shall** be advised of the request for waiver.
- 8.2.5.2. The approved LS SQM waiver **shall** accompany the shipping documents.
- 8.2.6 (*LG) The Supplier **shall** request for LG source inspection for verification at the Supplier's facility when the product is complete and accepted through the Supplier's Quality Management System via submission of a Net-Inspect / e-Source entry.
- Note: Source Inspection will typically be scheduled within 2 days of notice received.**
- 8.2.7 LS inspection representatives are available Monday to Friday 8am to 5pm, local standard time, including travel time. Requests for source inspection outside of working hours may be subject to charge back of associated labor costs.

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8.2.8 The Supplier **shall** plan their manufacturing process and lead times to accommodate adequate time to support source inspection activities and remain compliant to purchase order due dates.

8.2.9 (*LG) Non-delegated or loss of delegation Suppliers: Non-delegated or loss of delegation Suppliers are responsible for all costs associated with having their product verified prior to being received by LG, except for First Article Inspection verification.

8.3. Certifications

8.3.1 Laboratory certifications **shall** reflect actual values, including mill data.

8.3.2 The Supplier is responsible for approval of material received including traceability to the manufacturing source and heat lot (as applicable).

8.3.3 All raw materials consumed within the product or assembly **shall** have an accompanying material certification and test report, when applicable, available for source inspection.

8.3.4 Certifications **shall** include all applicable information required to identify the item being certified, including but not limited to the following as applicable:

- Part number
- Specification number, name, and revision
- Quantity
- Date
- Traceability numbers
- Approval statement / signature

8.3.5 The Supplier is responsible for ensuring all certifications (e.g., material, test reports, special processes, calibration) are validated and verified to confirm the applicable design authority and specification requirements are met. This process is separate from a receiving inspection process and is for all Suppliers, including those with design authority.

8.3.6 All LS consigned material (e.g., forgings and castings), drop-shipped from a LS forging Supplier or LS raw material Supplier to a LS manufacturing Supplier **shall** be accompanied by a packing slip and Certificate of Conformance.

8.3.7 Material that is shipped directly from a LS site to a manufacturing Supplier **shall** include the Certificate of Conformance and LS shipping ticket possessing a LS quality unique identifier.

8.4. Process Certifications

8.4.1 Special process certifications **shall** include the information necessary to provide evidence of contractual and specification conformance. At a minimum, special process

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certifications **shall** include evidence of completion for all applicable lot / batch acceptance tests along with the corresponding results.

- 8.4.2 In addition to the requirements stated above, NDT certifications **shall**, at a minimum, be countersigned by the authorized Level II personnel that performed the inspection.
- 8.4.3 Material traceability **shall** be listed on certifications for all organic coatings applied including the mfg. lot / batch information and expiration date(s), at a minimum.
- 8.4.4 Any exceptions taken to contractual and / or specification(s) requirements, as pertinent to the special processes performed, **shall** be stated within the certification with reference to the LS authorized deviation (e.g., QN).
- 8.4.5 Special process certifications **shall** include the information contained within Table 2.

8.5. Certificate of Conformance (CoC)

- 8.5.1 A CoC **shall** be provided for each shipment from Suppliers to Collins LS sites and **shall** meet the criteria below.

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Table 2 – CoC Information

Information	When Required	Description
Date of CoC	Always	Date CoC completed
Supplier name and address	Always	Name, address, (manufacturing or service provider releasing the CoC)
Deliver To	Always	Name and address of location to which product is to be delivered
Purchase Order (PO) Number	Always	Customer purchase order number
PO Line-Item Number	Always	PO Line-Item Number
Quantity	Always	Quantity of delivered products or services
Part Number	Always	Part number (including applicable dash number) as listed on PO
Part Name	Always	Part name as listed on PO
Engineering Revision	Always	Full drawing revision including all applicable engineering documents (including ATP / ATR Revisions)
Country of Origin	Always	Country location of manufacture
CoC Approval	Always	<ul style="list-style-type: none"> Signature or Unique Identifier (electronically printed or manually and legibly written (e.g., signature, stamp, etc) of the person releasing the product or service. Electronic signature is acceptable if traceable to approver.
CoC Approval Date	Always	Date CoC Approval signature applied
Forging or Casting Approval Memo Number	As applicable	Approval Memo Number
DIR Revision (*LG)	As applicable	DIR Revision
Date of Manufacture (DoM)	As applicable	For items with limited shelf life; Date of Manufacture or Cure Date for elastomeric products
Traceability	As applicable	Serial number(s) of parts delivered.
QN / MRB Number	As applicable	<ul style="list-style-type: none"> List of all QN Numbers associated with this shipment. If QN number is listed, objective evidence must be provided of completed QN with shipment. When a part is shipped with an open QN, Request for Custody (RFC) Form shall be used (Contact Your LS Procurement Representative)
Sub-Component Part Number, Revisions, S/Ns	As applicable	Listing of all applicable Part Numbers, Revisions, Serial Numbers (if required) denoted from the Parts List or Bill of Material for the item denoted on the applicable Purchase Order at minimum.
FAA - PMA Statement	As applicable	Enter applicable information

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9. POSTPRODUCTION / DELIVERY

9.1. Packaging

9.1.1 The packaging of product shipped to LS **shall** ensure protection from transit damage and at a minimum comply with the following as applicable (in addition to any stated requirements in Drawings / Specifications):

- Reference ASTM-D3951 for “Standard Practice for Commercial Packaging”
- Reference MIL-STD-2073 (current revision) for “Standard Practice for Military Packaging”
- LS-SBU-A001-SCM - Landing Systems Aerospace Supplier Packaging and Labeling Requirements

9.2. Shipping

9.2.1 (*LG) Collins LG has selected Net-Inspect eSource to be the repository and means / medium of submission for shipping documents (including FAIs, certifications and other quality records). Suppliers **shall** submit all required documentation to support product compliance as the product engineering defines within Net-Inspect eSource. If a part number is not available in Net-Inspect eSource, the Supplier **shall** request the part number to be added through Net-Inspect eSource.

9.2.2 (*LG) If export control regulations prevent technical data from being shared in Net-Inspect eSource, MOVEit **shall** be used for shipping submissions.

9.2.3 (*LG) Shipping to Collins Landing Gear **shall** occur upon completion of Net-Inspect eSource approval.

9.2.4 (*LG) Approvals of submissions will be maintained within Net-Inspect eSource.

Note: Paperwork stamped by a Collins Representative does not signify acceptance for product shipment. Paperwork that is stamped / signed / approved by Collins Aerospace representatives, must be uploaded, reviewed, and approved in Net-Inspect eSource.

9.2.5 The following records are required to ship with product to LS sites:

- (*LG) eSource Approval Record (e.g., The eSource Inspection Record (IR) approval page in full including; Part Info, Checklist, and Documents)
 - Approval status must indicate “Approved” or “Auto Approved”
- (*WB) Certificate of Conformance
- Packing slip
- Any Collins Request for Custody (RFC) or Collins Approved Waiver form
- Any required international or regulatory shipping documentation

Note: All documents considered as records of manufacture (including those listed above) **shall** be retained by the Supplier and the applicable records uploaded to Net-

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Inspect eSource as required by the applicable specifications and or drawing requirements.

9.3. Drop Shipments

- 9.3.1 When authorized by PO, Suppliers can ship directly to LS customers or other LS Divisions using the Supplier shipping documentation:
- 9.3.2 The method of shipment **shall** be provided by the LS procurement representative that identifies drop shipment instructions / requirements.
- 9.3.3 The PO number **shall** be referenced on the shipping documentation.
- 9.3.4 If serialized, the serial numbers being shipped **shall** be recorded on the shipping documentation and submitted to LS SQM or designee via eSource submission. LS procurement representative **shall** provide the stamped and dated shipper and Collins Certification of Conformance back to the Supplier upon successful completion of serial number clearance.
- 9.3.5 The Supplier **shall** provide a completed LS shipper, packing slip, Supplier Certification of Conformance with the parts per the LS procurement representative instructions.

10. POST DELIVERY

10.1. Disclosures / Notice of Escape (NOE)

- 10.1.1 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.
- 10.1.2 Suppliers **shall** use the Notice of Escape AS9131 form and perform the following actions:
 - 10.1.2.1. Upload Notice of Escape (AS9131 form) and any supporting attachments to MOVEit (Supplier information transfer portal) MFT → NOE Folder.
 - 10.1.2.2. Send a notification email to Collins Landing Systems using the following address:
ls-sqm.noe@collins.com
 - 10.1.2.3. The following information is required within the notification email (do not attach the NOE or supporting documents in the email):
 - Posting location on MOVEit (screenshot)
 - Time of Submission on MOVEit
 - Impacted site(s)

Note: Ensure technical data is not included within the notification email.

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10.2. Service and Warranty

- 10.2.1 Service and warranty repair components **shall** not be mixed with new production components during manufacturing or storage. These components **shall** not be assembled into new production without the written authorization of LS and (when required) concurrence of LS customer.
- 10.2.2 All service and warranty components **shall** be uniquely identified for traceability in the Supplier's system throughout the repair process.
- 10.2.3 Repairs **shall** not begin without a repair purchase order and LS authorization.
- 10.2.4 Parts and assemblies received from LS or an 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.
- 10.2.5 Upon request, the inspection results and analysis, (e.g., Failure Analysis Report (FAR)) indicating the date of original manufacture and date returned items were received, **shall** be maintained, controlled, and submitted to LS for review and approval. The results **shall** include:
- All inspection / rejection MRB generated on components found discrepant (all MRB **shall** be marked "Service").
 - 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.
 - Serialized Component list (the Supplier is responsible for only the components replaced during the warranty or repair rework).
 - ATP / Test Report.
 - MRB clearance list of all new / consigned parts used in the repair (list all other open issues or QNs with the serviced item).
 - Any MRB QNs generated with approved MRB clearance during the repair process.
 - Replaced items **shall** be accompanied by Certification of Conformance, which **shall** include applicable data such as cure dates for O-rings, seals, etc.
 - FARs **shall** be completed within 30 days upon receipt of returned product.
- 10.2.6 All documentation **shall** be traceable to the LS service work order and / or purchase order number.
- 10.2.7 Failure Analysis Reports (FAR) **shall** be submitted through MOVEit when required. (*LG) FAR may be submitted via LG-DIV-SQA-FORM 4486.

10.3. Corrective Action Process

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- 10.3.1 As applicable, Supplier **shall** respond to Supplier Corrective Action Requests (SCAR) within requested timeline.
- 10.3.2 Containment for the issues communicated **shall** occur per the requested timeline and the subsequent results of the containment actions **shall** be submitted to LS.
- 10.3.3 The Supplier response **shall** determine the root cause, identify immediate corrections to be taken to prevent nonconforming condition to continue, and identify the corrective actions to be taken against the identified root cause to prevent reoccurrence.
 - 10.3.3.1. As appropriate and consistent with the risks and complexity of the issue, the initial Supplier response may identify a plan or timeline to identify the corrective actions to be taken against the identified root cause in lieu of the actual actions.
 - 10.3.3.2. In this case, the Supplier submission is required to include the determined Root Cause and immediate corrections along with the plan. The plan must include dates and responsible persons.
- 10.3.4 Supplier **shall** provide objective evidence of any stated documentation to LS as requested. Objective evidence may be requested at any time and will be used to determine the efficacy of statements made in the Supplier response (from root cause determination to corrective action efficacy).

10.4. Preventive Action / Risk Mitigation

- 10.4.1 Suppliers are expected to use read across (QNs, SCARs, corrective actions, audits, etc) and data analysis to determine and apply preventive actions across Supplier product, manufacturing processes, and QMS.
- 10.4.2 Zero Defect Plan™ (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>

10.5. Variation Management of Key Characteristics

- 10.5.1 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.
- 10.5.2 All data pertaining to key characteristics **shall** be made available upon request and will require approval by LS Supplier Quality Management.
- 10.5.3 When required, data will be provided in the format prescribed per AS9103, Variation Management of Key Characteristics (VMKC).
- 10.5.4 All processes that effect key characteristics **shall** be evaluated for statistical process capability (Cpk).

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- 10.5.4.1. Cpk values less than 1.67 **shall** be addressed by the Supplier with an improvement plan.
- 10.5.4.2. Cpk values less than 1.33 **shall** be addressed by the Supplier with a Corrective Action (Supplier's format)

10.6. Supplier Performance / Monitoring

- 10.6.1 LS Suppliers are subject to performance monitoring including but not limited to:
 - Process / performance metrics (as identified by LS and subject to change)
 - Compliance to LS requests for information / responses
 - Timeliness of responses / actions requested
 - Product / Process Audits
 - Quality System Audits
 - Escapes to Collins LS or its customers

11. COLLINS AND CUSTOMER SPECIFIC REQUIREMENTS

11.1. LS Oakville Offload Operations

- 11.1.1 For operations offloaded from LS Oakville, parts are to be inspected and certified as follows:
 - All offload operations or special processes are subject to FAI review and approval by LS SQM or Designate.
 - Any operation or special processes which generate toleranced dimensional results are subject to the First Article Inspection requirements noted herein (e.g., grinding, specified plating locations).
 - Any operation or special processes which do not generate toleranced dimensional results are required to provide a Certificate of Conformance only (e.g., NDT, heat treat).
 - Supplier **shall** perform 100% inspection for all criteria and requirements as indicated on the offload MPS and as per purchase order requirements.
 - Supplier **shall** retain records of parts inspection.
 - Supplier **shall** certify parts to the applicable purchase order requirements.
- 11.1.2 SQM reserves the right to allow certifications of compliance to be approved and parts shipped without DQR stamp. Guidance to be provided by SQM as product is completed and ready for source.
- 11.1.3 LS Oakville offload purchase orders only: Parts manufactured to an Offload Manufacturing Process Sheet (MPS) operation **shall** have an FAI created to the criteria and requirements as defined by purchase order.
- 11.1.4 Contact your assigned SQM representative or Collins LS Procurement representative for clarification.

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11.2. Specific LS Customer Requirements

11.2.1 Airbus

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

11.2.1.2. All Airbus Quality requirements must be in accordance with GRESS (current revision) and / or ASR Airbus Supplier Requirements, current rev. (per applicable program) found on Airbus Supplier Portal.

11.2.1.3. Product designated with key characteristics **shall** include an approved interchangeability document completed per requirements with each shipment.

11.2.2 Lockheed Martin Aeronautics (LMA)

11.2.2.1. Suppliers **shall** comply with applicable Appendix QX (current revision) LM Aero Supplier Quality Requirements found on Lockheed Martin Aeronautics Supplier Portal.

11.2.2.2. LM Counterfeit Parts Prevention (for the following verbiage Seller is defined as LS Suppliers, Buyer is LS):

11.2.2.3. Seller **shall** establish and maintain a Counterfeit Parts / Material Prevention and Control Plan using AS5553 (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.

- 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.
- 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 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

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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.

- Seller **shall** notify Supplier Quality Engineer and Buyer 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.
- 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. If additional information is required, the Supplier **shall** contact the LS Procurement representative. The LS Procurement representative will then contact the appropriate PQE or Program Management for clarification. For Suppliers providing LM product, Suppliers **shall** comply with LM’s PM-5010 (current revision)

11.2.3 Transport Canada

11.2.3.1. 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, such as: MPS approvals or DOC 200, you will need to contact your LS Procurement representative or SQM representative requesting written consent prior to subcontracting. 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.

11.2.3.2. LS **shall** communicate the written consent back to the author of the request.

11.2.3.3. 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 7 of this document.

11.2.4 Boeing

11.2.4.1. 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.

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- 11.2.4.2. 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.
- 11.2.4.3. The Supplier **shall** ensure that First Article Inspection records for all standard hardware with Boeing design authority are available upon request.
- 11.2.4.4. Reference Boeing D1-4426: User Instructions & Requirements:
- 11.2.4.5. "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."
- 11.2.4.6. "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."
- 11.2.4.7. 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.
- 11.2.4.8. This appendix is available on the Boeing Approved Process Sources D1-4426 web site: <http://active.boeing.com/doingbiz/d14426/Appendix-D.pdf>
- 11.2.4.9. 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/>.
- 11.2.4.10. Supplier's compliance to D6-51991 will be assessed. Reference LS-LG-W-426-ENG, on the Supplier portal for more information and LS requirements.
- 11.2.4.11. For Boeing Commercial product, Boeing quality clauses: Q29, Q31, T88, U52 found on the Supplier portal, 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. Boeing Quality Clauses can be found on the Collins Portal.
- 11.2.4.12. Operator Self-Verification Program (Flow-down to Supply Chain): If Seller uses an Operator Self-Verification (OSV) program, Seller **shall** comply with the requirements set forth in SAE industry standard AS9162, "Aerospace Operator Self Verification Programs", as may be amended from time to time. Buyer reserves the right to conduct

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surveillance at Seller's facility to determine that Seller is compliant to the requirements of AS9162.

11.2.4.13. Boeing Document D1-4426, "Approved Process Sources": Suppliers and Sub-tiers **shall** comply with Boeing document D1-4426 "Approved Process Sources".

<http://active.boeing.com/doingbiz/d14426/index.cfm>

11.2.4.14. D1-4426, subject to revision from time to time, defines the approved sources for special processing, composite raw materials, composite products, aircraft bearings, designated fasteners, and metallic raw materials. The Seller's purchasing information **shall** conform to the purchasing data requirements of Boeing document D1-4426 Appendix D. These purchasing data requirements can be found at:

<http://active.boeing.com/doingbiz/d14426/Appendix-D.pdf>

11.2.5 **Sumitomo Precision Products (MRJ program)**

11.2.5.1. AQ1-11108 Visual Inspection Procedure of Parts for MRJ program. 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 AQI726. Both are available on the Supplier portal.

11.2.6 **Goodrich Actuation Systems**

11.2.6.1. In addition to LS quality requirements, compliance to 981-151-001 "Supplier Quality Assurance Requirements" and PFC-SC-025 DON "Supplier Quality Requirements" is required when supporting the Goodrich Actuation Systems programs. Both are available on <https://Suppliers.utc.com/SPPortal/Pages/Forms>

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Revision Description			
Revision	Date Entered into SmartSolve	Summary and Reasons for Changes	Originator
00	3/8/2021 4/6/2021	<p>Changed naming convention from "LS-SBU-A001-SQA [05]" to "LS-SBU-A001-SQM [00]".</p> <p>Reformatted entire document. No revision level change required. Administrative changes only. 1.4 Changed SQA to SQM 3.4.1 Changed SQA to SQM 31.2.2 c) Changed 2.2 to 26.4 31.3.1 Changed 1.7 to 7</p>	J. Oderberg
01	10/7/2021	<p>31.1.2 updated to include Airbus ASR and portal location 31.2.1 updated for QX in LMA portal location 20.1, 20.5, 20.7 added (*LG) 20 Added E-Source requirements, 20.1 Based on the Supplier's quality performance, Supplier, the assigned Supplier Quality representative can waive the on site verification. 20.2 Deleted: (*LG) Suppliers <i>shall</i> 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. 20.2 (was 20.3) updated LS-SBU-A003-SQA to LS-SBU-A003-SQM 20.4 Updated LS-SBU-F010-SQA to LS-SBU-F010-SQM. 20.6.5 Deleted: The DQR <i>shall</i> stamp and date the LS-SBU-F005-SQA and each certification, as evidence of review and acceptance. Added: Physical stamping of documents is not required when using Net Inspect E-Source. 26.1 Added: Approved Custody Form will be uploaded as objective evidence within Net Inspect E-Source. 20.7.1 Removed MOVEit, added assigned SQ representative 20.11 added electronic signatures are acceptable 21 updated 30.1 Added: Collins approved special processors are listed on DOC 200 found here: https://utcaerospacesystems.com/Supplier-documents/ 30.6.3 Added: Parts <i>shall</i> be serialized prior to heat treat operations. 31 Added: Contact your assigned SQM representative or Collins buyer for clarification.</p>	J. Oderberg
02	5/24/2023	<p>Complete rewrite and reformatting incorporating LS-SBU-A002-SQM, LS-SBU-A003-SQM, and LS-SBU-A004-SQA requirements and aligning requirements to ASQR-01 and COL-ASQR-PRO-0003. Revised title from 'Landing Systems Supplier and Product Quality Requirements' to 'Supplier Quality Requirements' since 'Landing Systems' is within the header. Section 3.4 - added reference to U.S. Code of Federal Regulations 14 CFR 21.307</p>	J. Oderberg

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