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<b>Originator:</b> Daniela Stoyova, Quality Systems Specialist	<b>Process Owner / Document Custodian:</b> <a href="#">Director of Quality, Operations and Engineering</a>		<b>Released By:</b> Daniela Stoyova, Quality Systems Specialist
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**Blue text indicates the changes for this revision.**

1. **PURPOSE:** This manual establishes the minimum elements of a Supplier's Quality Assurance System required for Kaman Aerospace Jacksonville (KAJ) deliverable material and special process suppliers.
  - 1.1. The supplier's quality system shall provide for the control of quality throughout the procurement, Manufacturing, inspection, and delivery processes. Supporting documentation shall be maintained and made available upon request. Suppliers shall flow down requirements to all sub-tier suppliers.
  - 1.2. The requirements of this document must be complied with when specified on KAJ purchase order.
  - 1.3. Suppliers of proprietary items may be exempt from requirements within this document. For specific direction contact KAJ Supplier Quality Representative.
  - 1.4. The use of customer approved sources does not relieve the user of the responsibility for subcontractor controls, including verifying current approval status and process compliance.
  
2. **SCOPE:** This document is not intended to supersede any contractual or specification requirement. If a conflict occurs the PO/Contract or specification requirement shall take precedence.
  
3. **RESPONSIBILITY AND AUTHORITY:** [Director of Quality, Operations and Engineering](#) is responsible for the control of this document.
  
4. **DEFINITIONS:**
  - 4.1. **Conventional Inspection Sheets (CIS)** – Bubble, balloon drawings – A drawing that captures each design characteristic of a part and attributes a unique identifier, often a number,

to the design characteristic. The unique identifier may be circled or highlighted for easy visual identification. The number correlates to AS9102 Form 3, linking the design characteristic to the First Article Inspection Report.

4.2. **Output** – Product or service generated internally, received from an external provider, or identified by KAJ.

## 5. REFERENCE DOCUMENTS:

5.1. **Form J198** - Vendor Request for Variation

5.2. **NAS 412** - Foreign Object Debris and Foreign Object Damage (FOD) Prevention

5.3. **AS9102** - First Article Inspection requirements

5.4. **Procure-2-011** - Sikorsky Supplier Quality Requirements

5.5. **AS9100** - Quality Management Systems - Requirements for Aviation, Space and Defense Organizations

5.6. **AS9120** - Quality Management Systems - Requirements for Aviation, Space and Defense Distributors

## 6. PROCEDURE:

### 6.1 KAJ QUALITY SYSTEM REQUIREMENTS FOR SUPPLIERS

6.1.1 Suppliers who directly supply material to KAJ shall have a registered Quality Management System complying with one or more of the following:

- **Hardware / Product Manufacturers**  
SAE AS/EN9100 or ISO9001
- **Distributors / Raw Material Suppliers / Warehouses**  
SAE AS9120  
ISO9001
- **Special Process Suppliers**  
AS/EN 9100  
AC7101 NADCAP  
AC7004 NADCAP
- **Calibration Laboratory Suppliers**  
ANSI / NCSL Z540.3  
ISO10012  
American Association for Laboratory Accreditation (A2LA)  
ISO/IEC17025

6.1.2. Quality Management System (QMS) Certificate(s) of Registration must be issued by an accredited Certification Registration Body (CRB).

6.1.3. Suppliers with unregistered Quality Management Systems (QMS) are subject to KAJ [Director of Quality, Operations and Engineering](#) Approval and periodic facility assessments by KAJ.

6.1.4. Suppliers shall formally notify KAJ Supplier Quality within 5 business days of any changes to their Quality Management personnel or QMS /National Aerospace and Defense Contractors Accreditation Program (NADCAP) registration(s) including major audit findings, new certification(s), suspension, or expiration.

### 6.2 KAJ SUPPLEMENTAL REQUIREMENTS TO AS/EN 9100 AND ISO 9001 STANDARDS

6.2.1. For the purpose of defining product compliance within the body of this document, reference to Purchase Order is inclusive of the Vendor Instruction and all process /manufacturing requirements.

### **6.3 PRODUCT REALIZATION (AS9100 Operation)**

6.3.1. Supplier shall include objective evidence of compliance to the current revision of ISO9001/ AS9100.

6.3.2. Supplier generated AS9102 FAIR shall be submitted to KAJ prior to manufacturing of parts at Supplier.

6.3.2.1. The FAIR will include Forms 1, 2, and 3. The FAIR does not have to be complete, as the intent of this review is to verify the FAI plan, before manufacturing part, meets Customer requirements. The FAI will need to be submitted to KAJ Supplier Quality Department at [KAJSupplierQuality@kaman.com](mailto:KAJSupplierQuality@kaman.com).

6.3.3. Questions or conflicts regarding engineering issues shall be documented and provided to KAJ via the Tech Help process on Kaman Tech Help Form to e-mail address [KISMTEch@Kaman.com](mailto:KISMTEch@Kaman.com).

6.3.4. For tools that have been issued to a subcontractor / vendor for processing of materials, the subcontractor / vendor is directly responsible for notification and submission of tools due for calibration / delinquency to KAJ.

### **6.4 CONTROL OF DOCUMENTS**

6.4.1. It is the supplier's responsibility to obtain copies of all non-Kaman documents at supplier's cost, for example but not limited to: ISO, SAE, ANSI, AWS, AIA, and NAS.

6.4.2. Supplier shall maintain a work instruction or equivalent document for the control of product processing, quality, and configuration for each part number through all stages of production.

6.4.2.1. Quality records (non-electronic) shall be written, printed in ink or other permanent marking.

6.4.2.2. Corrections to work instructions or documents shall be in ink, recorded, dated and traceable to the originator (e.g., signature, stamp, etc.) with the original data remaining legible after the correction.

### **6.5 RESOURCE MANAGEMENT – COMPETENCE, AWARENESS & TRAINING**

6.5.1. When required by KAJ customer (Ref KAJ customer, Supplier Quality Requirements), supplier shall implement procedures for annual eye examinations of individuals performing calibration, visual and dimensional inspection.

6.5.2. A qualified ophthalmologist or designee shall perform the eye examinations below:

- a. Near vision shall be equal to Jaeger #1 at not less than 14 inches.
- b. Distant vision shall be equal to Snellen 20/30.
- c. Color vision shall be satisfactory when tested with Ishihara dot test. (Sikorsky Product Only).

6.5.3. Individuals performing visual inspection of welds shall be compliant with American Welding Society Standard (AWS) D17.1.

6.5.4. Individuals performing nondestructive testing (NDT) shall be complaint with Aerospace Industries Association National Aerospace Standard (AIA) / NAS 410 and Customer requirements and be National Aerospace and Defense Contractors Accreditation Program (NADCAP) accredited.

6.5.5. Supplier Management shall provide all necessary training and maintain reports / certifications to ensure employee skill levels and visual requirements meet the scope of work being performed.

- 6.5.6. All training, results of tests, reports, certifications etc. shall be documented and maintained for a minimum of 10 years or a period specified by KAJ customer (Ref KAJ customer, Supplier Quality Requirements).

## 6.6 VERIFICATION OF PURCHASED PRODUCTS

- 6.6.1. Suppliers shall provide raw material test reports / certification results / lab analysis data (e.g., tensile, hardness, chemical composition, mechanical properties etc.) as defined by the product definition data and/or Purchase Order requirements.
- 6.6.2. Hardness and / or conductivity shall be verified by supplier or by authorized / approved facility per requirement.

## 6.7 SPECIAL PROCESSES APPROVAL

- 6.7.1. Unless otherwise specified by drawing or Purchase Order, suppliers must use KAJ customer approved special processors.
- For Kaman Helicopter designed products, the Qualified Process Supplier List (QPSL) can be viewed at: <https://kaman.com/brands/kaman-air-vehicles/suppliers/>
  - For subcontracted (Non-Kaman) programs; it is the supplier's responsibility to verify the specific Customer special processor approvals:
  - Boeing Programs: <https://active.boeing.com/doingbiz/d14426/GetAllProcessors.cfm>
  - Sikorsky Aircraft Programs: Contact Kaman Supplier Quality
  - Bell Helicopter Programs: Contact Kaman Supplier Quality.
  - All Other Programs: Contact KAJ Supplier Quality.
- 6.7.2. Process suppliers who perform work directly for manufacturers of proprietary items are not required to be approved by KAJ.
- 6.7.3. Supplier purchase orders for sub-contracted work and/or special processing shall flow down all applicable Customer requirements.
- 6.7.4. For production of Boeing A-10 parts the following (e.g., cutting, trimming, or coating removal) processes are prohibited unless qualified and approved by Boeing/Government:
- Laser
  - Plasma
  - Electrical Discharge Machining (EDM)
  - Torch and other thermal processes (e.g., cutting, trimming, or coating removal)
  - Non-thermal cutting processes involving high pressure fluids and slurries (e.g., water jet)
  - Plastic media blasting and similar coating removal processes

## 6.8 CONTROL OF MONITORING AND MEASURING DEVICES

- 6.8.1. Supplier calibration systems shall meet the requirements of ANSI-Z540-3 or ISO-10012-1.
- 6.8.2. Gauges, measuring and test equipment, (M&TE) used for acceptance purposes shall be calibrated to standards traceable to the National Institute of Standards and Technology (NIST). If such standards are not available at NIST, industry standards may be used. All supplier owned or Customer furnished M&TE shall be included in supplier's periodic calibration recall program. Visual examinations for damage or wear as well as dimensional features that are characteristic to inspection of the output shall be

documented at each calibration interval. Out of tolerance conditions shall be reported to KAJ Supplier Quality for resolution.

6.8.3. Sikorsky Aircraft Corporation only: Significant–Out–Of–Tolerance (OOT) conditions are defined as any M&TE OOT Output that displays OOT condition exceeding 25% of the product tolerance. Conditions require a documented review for impact by KAJ output quality.

6.8.3.1. When a supplier determines that KAJ output (in house or shipped to KAJ) has been adversely affected the supplier shall notify KAJ Supplier Quality within 24 hours of the discovery.

## 6.9 INTERNAL AUDITS

6.9.1. The supplier shall conduct Quality Management System (QMS) internal audits to encompass the entire QMS, including any customer unique requirements, at a minimum, every three years.

6.9.2. Internal audit results shall be retained and be available for review.

## 6.10 INSPECTION SYSTEM REQUIREMENTS

6.10.1. Supplier shall perform receiving inspection on all production materials, as necessary to ensure conformance to contract requirements.

6.10.2 100% inspection shall be performed on all deliverable products unless KAJ has provided written approval for the use of sampling inspection/ statistical process controls.

6.10.3. Sikorsky Aircraft Corporation only: A final inspection checklist must be used by the supplier to verify inspection of production lots to specific requirements, refer to Procure-2-011. The checklist (like AS9102, Form 3) must reflect each drawing attribute and drawing notes, the quantity of outputs accepted/ rejected and full traceability to output traveler. Recording of actual results are not required, but an acceptance authority (e.g., stamps, electronic signatures, etc.) will be used to indicate each attribute is within tolerance on all outputs in the lot.

6.10.3.1. The checklist for each production lot shall be retained as a quality record by the supplier and be available for review by KAJ.

6.10.4. Supplier shall select M&TE with a precision ratio of 10:1 for inspection of outputs; if a ratio of 10:1 is not achievable contact KAJ Supplier Quality, a ratio of 4:1 may be acceptable, see clause 6.10.4.1.

6.10.4.1. Use of M&TE with accuracy ratios less than 4:1 is not permitted unless a detailed measurement uncertainty analysis in accordance with ANSI/NCSL Z540.3 indicates an uncertainty ratio of 1.5 to 1 or better, and the measurement process is maintained under statistical quality control.

6.10.5. Supplier shall establish and maintain inspection points at appropriately located intervals in the manufacturing process.

6.10.6. Supplier's Certificate of Conformance (C of C) shall contain all necessary data recorded as specified in Purchase Order and shall contain at a minimum:

- a. Part Name
- b. Part Number
- c. Quantity of Parts
- d. Signature/Stamp

- e. Title of Signee
  - f. Date
  - g. Purchase Order Number
  - h. Revision of Part
  - i. Manufacturer
  - j. Lot Code
  - k. Vendor Instruction (VI) Revision
  - l. Serial Number (When Applicable)
  - m. Materials Used
  - n. Processes Performed
- 6.10.7. When sub-tier supplier certifications / test reports are used as a basis for material acceptance purposes, supplier shall independently validate accuracy of cert data on a periodic basis.
- 6.10.8. All material certifications shall be in the English language, legible, and provide traceability to outputs.
- 6.10.9. All Supplier and sub-tier supplier certifications and FAI's shall provide the specifications used and revision status.
- 6.10.10. Certifications and document packages are to be legible and maintained on file at the supplier's facility and are to be made available to KAJ within twenty-four hours, when requested.

#### **6.11 KAJ AND KAJ CUSTOMER REPRESENTATIVE RIGHT OF ENTRY**

- 6.11.1. Supplier shall permit KAJ & Customer representative right of entry into the supplier's facility and subcontractor's facilities. Entry shall provide for access to quality system documentation, source inspection, and quality records for conducting audits and/or product/process verifications.

#### **6.12 PRESERVATION, PACKAGING, STORAGE AND SPECIAL HANDLING**

- 6.12.1. Supplier shall provide necessary protection of all articles to prevent damage, loss, deterioration, or degradation in accordance with requirements contained in Purchase Order, or when not specified in the Purchase Order, good commercial practices shall be used.

#### **6.13 ADHESIVES, PAINTS, EPOXY'S, ELASTOMERS & OTHER LIFE SENSITIVE MATERIALS**

- 6.13.1. Supplier shall establish an effective system for control of environmentally sensitive materials.
- 6.13.2. Items received with less than 75% shelf life remaining shall be cause of rejection unless otherwise specified by the Purchase Order. Vendor managed inventory (VMI) will not be subjected to the 75% shelf-life requirement.
- 6.13.3. Suppliers shall include the applicable Safety Data Sheets (SDS) with each shipment and ensure that all packaging and containers are properly marked with SDS information, as required by federal, state, and local regulatory agencies.
- 6.13.4. Each item, package, or container shall reflect the specification, drawing, nomenclature, or other design description required by Purchase Order.
- 6.13.5. Cure or manufacturing dates, assembly dates, expiration dates, temperature limits, compound number, and manufacturing identification shall be recorded on the certifications and shipping documents, as appropriate.



- 6.13.6. Time and temperature-sensitive materials shall be maintained within the limits prescribed in the applicable document during storage and shipment.
- 6.13.7. Material that is to be shipped / stored at 40° F or less requires special temperature labels to be attached to exterior of each package. Labels shall reflect the words “temperature sensitive material” and the maximum material storage temperature allowed.

#### **6.14 SUPPLIER NOTIFICATION OF DELIVERED NONCONFORMING PRODUCTS TO KAJ**

- 6.14.1. When suspect or known nonconforming product has been delivered to KAJ, the Supplier shall notify the KAJ Supplier Quality within 24 hours of the initial discovery. The Supplier shall use receipt acknowledged e-mail or other positive notification method. The notification shall include the following information:
  - a. supplier name
  - b. brief description of the nonconforming condition
  - c. KAJ Purchase Order or Contract number
  - d. part number and description
  - e. affected quantity and serial numbers (if known)
  - f. dates delivered (if known)
- 6.14.2. The initial notification shall be followed by a formal “Disclosure Letter” delivered to KAJ Supplier Quality within 48 hours of the initial notification, and shall include the following information:
  - a. complete description of the nonconforming condition(s)
  - b. affected quantity of products, including serial numbers and dates delivered to KAJ.
  - c. potential effect of the nonconformance
  - d. immediate action taken by Supplier to contain the nonconforming products
  - e. root cause analysis of the nonconforming condition
  - f. corrective action plan and schedule
  - g. the plan and schedule for verifying the effectiveness of the corrective action

#### **6.15 SOURCE CONTROLLED ITEMS**

- 6.15.1. Supplier shall only procure source control specified items from those manufacturing sources listed on the KAJ and/or Customer Source Control Drawing.

#### **6.16 SERIALIZATION & IDENTIFICATION**

- 6.16.1. Applied part marking shall be legible and permanent and shall comply with MIL-STD-130 unless otherwise specified by Purchase Order or Customer requirements.
- 6.16.2. Traceability shall be maintained through the supplier’s system for lot control and serialization subject to approval by KAJ for material, parts, and assemblies when required by purchase order.
- 6.16.3. KAJ assigned serial numbers, when required by the Purchase Order, shall be obtained through the appropriate KAJ Purchasing
- 6.16.4. Supplier assigned serial numbers shall not be duplicated and shall provide full traceability to all material, fabrication, assembly, inspection, and test documentation.
- 6.16.5. Identification and inspection status shall be maintained during all phases of fabrication, denoting the inspection, change and/or time limited status of the supplies. This identification

- may be accomplished by means of tags, routing cards, move tickets, tote box cards, stamps, or other normal controls.
- 6.16.6. Inspection, serialization, identification, or acceptance marking shall be placed on the output in accordance with KAJ requirements and in a manner which will not damage the output or assembly.
- 6.16.7. Should serial numbers be assigned to specific product, the serial number must be recorded on all related certifications, First Article inspection reports, test data, etc. Serial number assignments shall be maintained by the supplier for all part numbers.
- 6.16.8. Outputs which are subsequently upgraded, reworked, or repaired must have the applicable marking added to the unit serial number, thus indicating the latest configuration of the output.

## 6.17 STATISTICAL PROCESS CONTROL (SPC)

- 6.17.1. When SPC is required, it shall be flowed down via the Purchase Order.
- 6.17.2. Suppliers SPC program shall be approved by KAJ prior to the supplier conducting SPC on KAJ outputs.
- 6.17.3. Approval of a supplier's SPC program does not relieve the supplier from complying with quality system requirements, or engineering/specification standards.
- 6.17.4. The PO will identify the key characteristic(s), governing specification, and data recording information.
- 6.17.5. The requirements of this document shall be in addition to other purchase order requirements.
- 6.17.6. When a key characteristic is flowed to the supplier, the supplier is obligated to achieve a minimum Cpk of 1.33 unless otherwise specified by contract.
- 6.17.7. All suppliers must submit their statistical quality assurance program for approval prior to use. Kaman approval will be based on an evaluation of:
- the qualification of personnel responsible for application and administration of statistical quality assurance.
  - written procedures covering classification of characteristics, application of data recording, and audit control of the system.
  - the comparability of the proposed quality level and control techniques to the complexity of product and its quality and reliability requirements.
- 6.17.8. When SPC is not a condition of the PO, a supplier may elect to implement SPC controls to reduce variability.
- 6.17.9. The supplier shall provide copies of data control charts and process capability charts, when requested. Special causes of variation must be noted on the control charts and investigated by the supplier.
- 6.17.10. The supplier must exhibit a method to study and improve processes and products to identify causes of variation. (Gauge Repeatability and Reproducibility, correct chart selection, etc.)
- 6.17.11. Key characteristics must be in statistical control.
- 6.17.11.1. Key characteristics will be considered in statistical control if the data points do not fall outside the control limits.
- 6.17.12. Process capability shall be determined after a process is in statistical control. KAJ can assist the Supplier with any questions or concerns regarding Advanced Quality System (AQS).



**6.18 FIRST ARTICLE INSPECTION REPORT (FAIR)**

- 6.18.1. First Article Inspection (FAI) shall be performed per current revision of AS9102 and as stated herein, by Purchase Order, or other contract requirements.
- 6.18.1.1. Supplier generated AS9102 FAIR must be submitted to KAJ prior to manufacturing of parts at Supplier. The complete FAI package shall consist of the following:
- a. Form 1- Must include Part Number, Part Name, Serial Number, FAIR Identifier, Part Revision Level, Drawing Number, Drawing Revision Level, Additional Changes, Manufacturing Process Reference, Organization Name, Supplier Code, Purchase Order number, Detail FAI numbers as applicable, etc. If FAIR contains a documented nonconformance this shall be referenced.
  - b. Form 2- Must include completed header, including FAIR Identifier and the processes being performed.
  - c. Form 3- Must include completed header, FAIR Identifier, all Characteristics, Engineering location, and Tools used for MOI. (Note: final results are not required, as this review is prior to manufacturing of parts).
  - d. The Bubble Drawing- Must include all characteristics from Form 3.
- 6.18.1.2. First Article Inspection Report (FAIR) shall be comprised of all design and engineering characteristics described within KAJ Purchase Order / Vendor Instructions as well as Customer engineering notes, dimensions and tolerances, Parts List requirements, and applicable specifications.
- 6.18.1.3. Each design characteristic shall be “bubbled” and shall correlate with each line entry on Form 3 of the FAIR. Bubble prints shall also be prepared to indicate non dimensioned characteristic applicable to the Model Base Definition (MBD) and / or Kaman Alternative Representation (KAR) files.
- 6.18.1.4. Boeing only - Boeing Commercial Product shall be submitted to KAJ for approval using NetInspect. Forms One, Two, and Three shall be completed.
- 6.18.2. The supplier shall use AS9102 forms or may substitute their own FAIR record, provided it meets all the requirements of the latest revision of AS9102 and specific customer requirements, e.g., Procure-2-011 (Sikorsky Supplier Quality Requirements).
- 6.18.3. Entries shall be electronically generated (preferred) or manually recorded with black or dark blue permanent ink.
- 6.18.4. Characteristics that are deemed special processes shall be included in the FAIR data and shall be traceable to the process certification.
- 6.18.5. First Article Inspection (FAI) shall be performed for product categories listed below.
- i. Assemblies
  - ii. Sub-assemblies
  - iii. Detail parts, including castings & forgings.
- 6.18.6. Standard hardware or Commercial Off -The-Shelf Items (COTS) are exempt from FAIR. Once modified, these items are categorized as detail parts for the purpose of assembly.
- 6.18.7. Partial or delta FAIRs shall be documented per AS9102 to include any and all changes addressing current configuration and previously approved configuration, as well as for the events described in subcategories.
- 6.18.8. KAJ reserves the right to request Supplier document a full or partial FAIR at any time.
- 6.18.9. AS9102 Form 1, Optional Fields shall be populated.
- 6.18.10. AS9102 Form 2, Material and/ or process specifications shall be reported to the current KAJ / customer engineering or as specified by contract.
- 6.18.11. AS9102 Form 3, All FAIRs shall include a line entry stating that inspection for presence of

- FOD has been performed.
- 6.18.12. For complex assemblies, FAIR packages may be presented in partial segments or sub-assemblies, subject to KAJ approval.
- 6.18.13. Sikorsky Aircraft Corporation only: AS9102 Form 3. A replication of product part marking (photograph or sample) that is representative of the production marking must be included within the FAI report.
- 6.18.14. FAIR report shall not contain open fields. To ensure each line entry of the FAIR has been reviewed, mark all open or unused fields “N/A”.
- 6.18.15. Supplier’s FAIR verified by, reviewed/ approved by and dates shall be recorded on Form 1.
- 6.18.16. Unless otherwise specified in Purchase Order, FAIR shall be performed at the frequencies or conditions as specified by AS9102.
- 6.18.16.1. FAIR parts with reported discrepancies that are not re-workable to drawing requirements shall include the KAJ approved Vendor Request for Variation (VRV) number.
- NOTE:** FAIR on the Sikorsky program will not be accepted with nonconformance.
- 6.18.17. Subsequent lot of outputs shall be subjected to a FAIR for those characteristics identified discrepant on the first lot, or until an acceptable FAIR is completed.
- 6.18.18. Deliverable FAIR outputs must be clearly identified as “FAIR Part” using tags or similar method.
- 6.18.19. The recording characteristics, data and inspection stamps-must be clear and legible.
- 6.18.20. All completed FAIRs shall be retained by supplier for a minimum ten (10) years, at which time KAJ shall be given the option for the transfer of ownership.

## 6.19 CONTROL OF NONCONFORMING OUTPUT & MATERIAL REVIEW

- 6.19.1. Suppliers shall establish and maintain procedures for the identification, segregation, and control of nonconforming products.
- Outputs found to be nonconforming to KAJ or customer engineering, specifications, contract, or other design requirements shall be identified, segregated, reworked, or replaced with conforming products prior to delivery to KAJ.
  - Suppliers of proprietary design items are not authorized to process “use as is or repair” dispositions which violate KAJ or Customer Source Control Drawing (SCD) and/or specification requirements.
  - Nonconforming outputs shall require submittal on form J198 Vendor Request for Variation (VRV).
  - Outputs deemed scrap must be clearly identified and rendered unusable within 30 days of final disposition unless otherwise instructed in writing by KAJ.
- 6.19.2. Vendor Request for Variation (VRV) Form J198.
- VRV form J198 shall be initiated by the supplier for nonconforming outputs that cannot be reworked to blueprint and or specification requirements and submitted to the KAJ Supplier Quality at [KAJSupplierQuality@kaman.com](mailto:KAJSupplierQuality@kaman.com).
  - The supplier shall perform a stock purge for work in process and inventory at their facility to ensure all outputs with the same discrepancy are included in the request.
  - A separate VRV form is required for each part number.
  - Each discrepant characteristic shall be listed as a separate item on the VRV form.
    - For example, if the nonconforming output has two different discrepant dimensions, shall be listed as item A and item B.

- e. Any subsequent work performed on the discrepant output prior to receipt of a formal VRV disposition by KAJ is solely at the supplier's risk.
  - f. When VRV dispositions have been performed, a copy of the VRV shall be signed by the supplier's inspection personnel and/or by KAJ Source Representative (as required) to certify the acceptance of work in accordance with the VRV disposition. All VRV rework / repair operations as well as any remaining manufacturing operations to complete the part must be performed and documented prior to source inspection or delivery of product.
  - g. All shipments of product covered by a VRV must include a copy of the dispositioned VRV document. The product shall have the VRV number permanently marked, or clearly labeled or tagged. The VRV number shall also be annotated on Supplier generated certifications, shippers, etc.
  - h. KAJ reserves the right to reject and return any nonconforming products to the Supplier at the Supplier's expense. Acceptance of nonconforming material is the sole prerogative of KAJ or our Customer.
- 6.19.3. KAJ Material Review Board (MRB) will not accept for review and disposition any outputs that can be reworked to meet drawing / specification requirements, or which are obvious scrap.
- 6.19.4. KAJ furnished material shall not be scrapped without written authorization from KAJ.
- 6.19.5. Any sub-assembly or assembly containing VRV detail components shall have the VRV number marked adjacent to the sub-assembly or assembly part number.
- 6.19.6. The VRV number shall be included on the part identification and recorded on the accompanying Certificate of Conformance and FAIR if applicable.

## **6.20 NONCONFORMANCE REPORT (NCR)**

- 6.20.1. Nonconforming outputs that are the responsibility of supplier require:
- a. A Root Cause & Corrective Action (RCCA)
  - b. RCCA to be submitted to KAJ Supplier Quality within 30 business days of notification.
  - c. RCCA to be approved prior to delivery of the nonconforming outputs to KAJ.

## **6.21 CORRECTIVE ACTION REQUIRED (CAR) NOTICE**

- 6.21.1. CAR responses shall be submitted to the KAJ Supplier Quality.
- 6.21.2. CAR issuance is based on but not limited to: NCR activity, unacceptable supplier rating, adverse trend analysis, unacceptable Root Cause and Corrective Action analysis etc.
- 6.21.3. The supplier shall take prompt action to determine cause(s) and to correct conditions which have resulted or could result in nonconforming outputs; this includes initiating and confirming corrective action with any sub-tier procurement sources.
- 6.21.4. The corrective action response must contain:
- a. root cause of the nonconformance
  - b. corrective action to prevent a recurrence of the nonconformance
  - c. reason condition not detected at supplier's facility
  - d. effectivity point of the corrective action must be given (i.e., by serial number, lot number, or date)

- e. 8D Root Cause & Corrective Action Analysis Form is recommended for use, but not required.
- 6.21.5. When a corrective action cannot be completed within 10 calendar days for Customer Rejections and 30 calendar days for Internal (Kaman) Rejections, the supplier may request extension. A current status of the corrective action investigation and plan for completion is required.
- 6.21.6. Supporting documentation for corrective actions shall be submitted (e.g., manufacturing work instruction changes, tool orders, engineering changes, training records, etc.).
- 6.21.7. KAJ reserves the right to validate implementation of all Corrective Actions.

## **6.22 SUPPLIER QUALITY RATING SYSTEM**

- 6.22.1. KAJ supplier quality rating is a factoring system based on part acceptance / parts received ratio, NCR activity is also included. KAJ has established a supplier performance rating of not less than 98% Quality and 98% for Delivery.

## **6.23 CONTROL AND USE OF DIGITAL DATASETS (3D-MBD/DPD/MODEL BASED DEFINITION)**

- 6.23.1. The following requirements define supplier's requirements for using 3-Dimensional Model Based Definition (3D-MBD) Electronic Data.
- 6.23.2. DPD / 3D-MBD requirements shall be imposed by Purchase Order and or Product Engineering when applicable shall and shall apply to sub-tier suppliers.
- 6.23.3. The suppliers DPD/3D-MBD system shall be approved by KAJ prior to the use of any KAJ (or KAJ customer) furnished datasets as authority for manufacture or inspection of outputs.
- 6.23.4. KAJ shall conduct regular assessments to verify supplier's capability to receive, control, manufacture and inspect to DPD / 3D-MBD engineering.
- 6.23.5. Supplier shall develop DPD / 3D-MBD documented procedures / process controls that include the following minimum elements:
  - a. Electronic data acquisition through secure FTP site, or other secure methods.
  - b. Software translation process and data verification.
  - c. Dataset security and storage.
  - d. Control of dataset configuration from receipt throughout the manufacturing process and acceptance processes.
  - e. Control and flow down of DPD / 3D-MBD datasets to sub-tier suppliers, when applicable.
  - f. Incorporation of DPD / 3D-MBD process changes and customer notification.
  - g. Independent validation from software developer of the Product Acceptance Software (PAS).
  - h. Control of obsolete dataset / derivative media.
  - i. Configuration control and traceability of dataset derivative media to master authority dataset.
  - j. Verification of dimensional accuracy of derivative data outputs / media to authority dataset.
  - k. Documented training of all personnel utilizing DPD / 3D-MBD model-based data.
  - l. Maintain certification/calibration requirements for CMS equipment, NC equipment with Inspection Probe capability, and plotters to produce drawings/Mylar's used as inspection media.
  - m. CMS compensation for non-controlled environments.

- n. Flow diagrams of all 3D-MBD processes.
- o. AS9102 First Article Inspection plan for each detail part and/ or assembly to include bubble print and/ or point cloud derivatives created from DPD / 3D-MBD model datasets or KAR files to capture and report all Geometric Dimensioning and Tolerance dimensions, tolerances, notes, and part reports, as well as “non-dimensioned” feature characteristics.
- p. AS9102 FAIR plan submittal to KAJ for review and acceptance prior to delivery of production material. Subsequent changes to the approved plan require KAJ acceptance.
- q. Inspection plan submittal for KAJ approval.
- r. KAJ approval is documented on form KAJ.SQ.F.12 (3D-MBD Process Audit Checklist) Internal audits of supplier’s 3D-MBD process.
- s. Conventional Inspection Sheets (bubble drawings) are recommended for Boeing product, all other programs Conventional Inspection Sheets are required.

## 6.24 COUNTERFEIT PARTS PROGRAM

6.24.1. If a part is not available from an authorized distributor/manufacturer, it may be purchased from the following sources, if approved by Kaman Supplier Quality and must include manufacturer Certification of Conformance:

- After market suppliers
- Authorized Brokers
- Customers with excess inventory
- Independent/Certified distributors and dealers
- U.S. Government stores
- Non-franchised distributors (with Kaman Supplier Quality Approval)
- Internet sources (with Kaman Supplier Quality Approval)

6.24.2. The supplier is required to provide actual manufacturer’s certification of Conformance be supplied with all purchases.

6.24.3. The supplier shall assure the following requirements are provided and shipped with each part:

- Manufacturer Certification of Conformance
- Complete traceability of the product
- Tests and inspection necessary to assure pedigree of material
- Level of quality management system
- Required documentation and certification

6.24.4. As a minimum: The supplier shall verify that Manufacturer’s Certification of Conformance is provided with all material and parts,-check for manufacturer’s markings on material and inspect for suspicious markings, repackaging, labeling and visible product defects.

6.24.5. The manufacturer’s certification of conformance must include the following to Kaman:

- Manufacturer’s name, address
- Part number and dash number
- Batch identification such as codes for date, lot, serialization, etc.

6.24.6. Counterfeit Parts Program - Electrical

6.24.6.1. Suppliers who receive approval to purchase from non-authorized companies must have all electrical characteristics verified by an independent testing facility. This testing shall be accomplished on 100% of the material. No sampling plan is allowed. Testing results shall be included with the certification package and provided to Kaman.

6.24.7. Under no circumstances, should any defective or counterfeit part be provided to Kaman.

### **6.25 FOREIGN OBJECT DEBRIS (FOD) Control**

6.25.1. FOD is defined as any substance or material not required by PO.

6.25.2. Supplier shall employ good housekeeping practices and where applicable: a Foreign Object Debris / Damage (FOD) prevention program to preclude introduction of foreign debris into any deliverable assembly items.

### **6.26 ESD CONTROLS**

6.26.1. Electrostatic Discharge (ESD) sensitive parts and assemblies shall be handled and packaged for delivery using appropriate ESD packaging materials and shall be clearly identified IAW MIL-STD-1686.

### **6.27 CRITICAL COMPONENTS**

6.27.1. Vended components designated as fracture, fatigue, and/ or flight safety critical by KAJ or KAJ Customers shall be identified on the appropriate Engineering drawing, VI, or Contract. When applicable, Quality Engineering shall assure that Vendor Instructions for critical components include:

a. requirements for supplier compliance, submittal of process plans

b. critical component identification per the part design

c. identification of qualification tests as required by applicable drawing or specification

6.27.2. Supplier shall provide copies of the original manufacturing process plan to KAJ purchasing. On completion of Quality Engineering, and customer approval, the authorization document shall be provided to KAJ purchasing for distribution to the supplier.

6.27.3. All changes must be approved and will require re-submittal of the complete manufacturing process plan.

### **6.28 PROGRAM QUALITY REQUIREMENTS**

6.28.1 In addition to KAJ SQRM requirements, the Supplier must comply with KAJ Customer's Quality Requirements. See Table I.



**TABLE 1**

Programs	Boeing	KAV	Bell	Sikorsky
Quality Requirements	Q09 Record Retention	KAV Supplier Quality Requirements Manual	SQRM-001	Procure-2-011 Sikorsky Supplier Quality Requirements
	Q011P Supplemental Quality Assurance Requirements			SS9998 - Standard Parts Index
	Q48 Supplemental Quality Assurance Requirements			SS7777 - Material and Process Specifications Index
	Q058 Discretionary FAA Surveillance			
	Q073 AS9102 Aerospace First Article Inspection Requirement			
	Q080 Raw Material Test Results			
	Q219P Nonconforming Material Control and Disposition			
	Q224P Retention of Records			
	Q29 Acceptance Authority Media			
	Q31 Boeing's Federal Aviation Administration (FAA) issued Production Certificate 700			
	Q029 Digital Product Definition (DPD)			
	MIL-STD-1916 (A-10) Military Standard-1916 - DOD Preferred Methods for acceptance of product			
	X31764 Quality Purchasing Data Requirements (BCA/BGS)			

**CONCURRING AREAS:**

Sami El Kadi, Director of Supply Chain  
Approved via email on [04/19/2024](#)

Stacey Vorwald, Quality Assurance Manager  
Approved via email on [04/19/2024](#)

Ryan Mitchell, Quality Control Manager  
Approved via email on [05/09/2024](#)

**APPROVAL:**

Sean Donahue, [Director of Quality, Operations and Engineering](#)  
Approved via email on [04/19/2024](#)

**Document Revision History**

Rev	Description of Change	Date Released	Training Required (Y/N)
0	Added Table 1 Program Specific Quality Requirements. Fixed Typos and converted to new KAO format replaced K964-6 Supplier Quality System Requirement Rev 1	2/12/2018	Y
1	Changed owner of processes from Buyer to Supplier Quality. Defined CoC requirements. Added Tech Help contact information. Added PPA waiver requirements.	4/10/2019	N
2	Updated to new format and removed Pre-Production Approval (PPA) requirement.	4/20/2020	N
3	Added Boeing A-10 prohibited processes clause 6.7.4. KISM.SQ.M.01 replaced by KAJ.SQ.M.01.	08/24/2020	N
4	Added Supplier Quality Contact information (para 6.3.2.1).	02/04/2021	N
5	Requirements updated.	01/31/2022	N
6	Para 6.3.4 added. Para 6.21.5, 6.20.1 (b) and 6.22.1 updated.	06/22/2022	N
7	Counterfeit Parts Program added.	05/05/2023	Y
8	Updates highlighted.	10/26/2023	Y
9	<a href="#">Updated para 6.7.1. c</a>	<a href="#">05/09/2024</a>	N