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**QUALITY ENGINEERING STANDARD ONE**

**FLIGHT SAFETY PARTS  
CRITICAL CHARACTERISTIC  
NEW MANUFACTURE**

**QUALITY SYSTEMS REQUIREMENTS**

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1.0 **PURPOSE:** To establish the minimum level of activity that is required to manufacture Flight Safety Parts (FSPs) containing Manufacturing Critical Characteristics (CCs). Requirements established herein are intended to establish and maintain the integrity of the CCs throughout the manufacturing process.

2.0 **SCOPE:** This document is to be used in conjunction with other contractually specified quality requirements. This document shall apply to all FSPs.

### 3.0 REFERENCES:

ANSI/ASQC B1, B2, B3-1996

ISO 10012-1

Competition Advocate's Shopping List (CASL)

ATCOM Regulation 702-7 (Flight Safety Critical Aircraft Parts/New Source Testing Program Management)

### 4.0 DEFINITIONS:

a. Flight Safety Part (Airframe): Any part, assembly, or installation containing a critical characteristic (CC) whose failure, malfunction, or absence could cause loss of or serious damage to the aircraft, and/or serious injury or death to the occupants.

b. Flight Safety Part (Engine): Any part, assembly, or installation containing a CC whose failure, malfunction, or absence could cause an uncommanded engine shut down, and/or an uncontained engine failure resulting in loss of, or serious damage to the aircraft and/or serious injury or death to the occupants.

c. Critical Characteristic: Any feature throughout the life cycle of a FSP, such as dimension, finish, material or assembly, manufacturing or inspection process, installation, operation, field maintenance, or depot overhaul requirement which if nonconforming, missing or degraded could cause the failure or malfunction of the FSP.

d. Approved Source: A manufacturer or vendor who has satisfied, prior to contract award, all ATCOM source approval requirements as set forth in the CASL to include, if applicable, engineering testing requirements (fatigue, endurance and/or interchangeability).

5.0 POLICY: ATCOM will only procure Flight Safety Parts from approved sources. So as to maintain the integrity and quality of these critical spare parts, manufacturers of FSPs, components, sub-assemblies, and assemblies are required to adhere to the requirements of this document in its entirety. If a contractor has difficulty in maintaining process control as evident through such things as internal management audits, customer audits, the receipt of quality deficiency reports for parts previously supplied to ATCOM et. al., this will require immediate corrective action for the current contract and could affect the award of future contracts to that contractor.

6.0 REQUIREMENTS: All requirements of this document (paras. 6.1-6.7) shall be complied with by a contractor receiving a contract to produce FSPs. If a process or processes that involve a CC is subcontracted, this document must be imposed, in its entirety, on the subcontractor performing the work.

6.1 MANUFACTURING PLANNING:

6.1.1 PLAN CONTENT: All manufacturing, assembly and inspection points shall be controlled by detailed procedures outlining each step or parameter of the process along with any materials, tooling, equipment, environmental control, and operator certification required that leads to the specific production of an end item. Plans shall clearly identify all CCs and will include identification, in accordance with contractor procedures, as to its particular revision. All process plans shall clearly define sequence of operation, machine type and accept/reject limits for the specific process or operation. Critical processes not easily verified by subsequent inspection shall clearly define process operating parameters with tolerances.

6.1.2 FROZEN PLANNING REQUIREMENTS: The contractor is responsible for developing manufacturing planning. Review and control of these plans will be the responsibility of the Contractor's Control Board (CCB) consisting of qualified personnel equipped with adequate resources to assure development of complete, reliable and traceable documentation. Parts manufactured utilizing these plans shall meet all contractual requirements. Plans developed for FSPs shall be frozen:

a. In the case of FSPs not requiring engineering testing, under the first production contract for the FSP at such time a successful First Article Test is completed or at the start of production if FAT is not required.

b. In the case of FSPs requiring engineering test, at the time articles are manufactured which successfully meet the engineering test requirements.

Once frozen, plans shall remain frozen throughout the existing contract and all subsequent contracts for the item unless changes to the planning are made in accordance with this standard.

6.1.3 CHANGES TO FROZEN PLANNING: The portion of the frozen manufacturing plan pertaining to a CC shall not be changed without prior CCB recommendation, justification to ATCOM and receipt of approval by the Procurement Contracting Officer (PCO). Changes not affecting CCs or occurring as the result of an ATCOM approved Engineering Change Proposal (ECP), require CCB approval only. All changes to frozen planning affecting CCs will be submitted to ATCOM. When the item, CC, or process is produced by a subcontractor, the planning shall be reviewed and approved by the contractor, and be subject to the same restrictions as above.

6.2 AUDITS: Contractors are to perform self audits of their frozen planning when that planning applies to CCs produced or verified in house. At a minimum audits will be performed at the start of each production contract, annually, and when process changes occur. It is incumbent upon the prime contractor to assure that subcontractors accomplish self-audits, and the prime shall maintain records verifying that their vendors are in full compliance with the audit requirement. All audit findings will be recorded and corrective action will be documented.

### 6.3 CRITICAL CHARACTERISTICS:

6.3.1 INSPECTION OF CRITICAL CHARACTERISTICS: All CCs which can be nondestructively inspected/tested shall be subjected to 100 percent inspection by the contractor or subcontractor. Critical Characteristics which require destructive testing are to be tested on a lot or batch basis, with no skip lots allowed. All inspection records shall identify the FSP part number, serial or lot number, and characteristic inspected. Critical Characteristics shall be identified on the inspection records in such a manner as to draw attention to them. Inspection records shall reflect the exact readings or dimensions, date of inspection, identity of inspector and any required inspection certification. These requirements are in addition to other contractual requirements.

6.3.2 VARIABILITY REDUCTION METHODS: Once the program demonstrates that the critical processes are statistically in control, stable and capable, the contractor may submit to the PCO for approval its documentation with a request to implement a Statistical Process Control (SPC) program in lieu of 100 percent inspection. This approval authority may be delegated to the Defense Contract Management Command (DCMC) by the PCO in which case ATCOM will be informed of any approval or suspension of SPC. At the Government's discretion 100 percent inspection may be reinstated if the process controls prove inadequate.

6.3.3 NONCONFORMING CRITICAL CHARACTERISTICS: Nonconformances of CCs shall not be dispositioned "use as is" or "repair" through contractor action, rework to print is acceptable. Waivers or deviations may be requested as specified in the contract. Request for waivers/deviations of CCs shall be classified as critical and will be forwarded to ATCOM for approval/disapproval.

6.3.4 CONTRADICTORY CRITICAL CHARACTERISTICS: Contradictions between the ATCOM FSP Spares Technical Data Package (STDP) list of CCs and the drawing/specifications shall not be resolved by the order of precedence paragraph in the STDP. The contractor shall notify the PCO immediately and any work pertaining to the CC in question shall be stopped until a written resolution to the contradiction is issued to the contractor from the PCO.

6.3.5 DELIVERED NONCONFORMANCES: Contractors shall notify the PCO immediately of any discovered nonconformances that may exist in previously delivered FSPs. Notification is required whether or not the characteristic in question has been classified as a CC. Notification shall include a description of the suspected nonconformance, contract number, part number and affected serial numbers or lot numbers, when applicable.

6.4 RECORDS:

6.4.1 TRACEABILITY OF RECORDS: All records relating to FSPs shall be traceable to the date and place of production. Records shall provide the degree of traceability required to enable subsequent verification of all aspects of material, manufacture, special process, personnel certification, variability control charts (if applicable), assembly and inspection of CCs. Special processes include but are not limited to heat treat, shot peening and nondestructive testing.

6.4.2 PURCHASING RECORDS: All purchase orders for subcontracted products or processes that contain CCs must clearly identify the CC and reference this document for compliance. All documents and referenced data for FSPs shall be available for review by the Government to determine compliance.

6.4.3 RETENTION OF RECORDS: The contractor shall retain copies of all records generated pursuant to this standard and make these records available to the Government upon request. Records shall be retained for a period of at least 5 years after the contractor ceases to manufacture the part for which this standard applies. At the end of this period or in the event of relocation or shutdown, all records shall be offered to the PCO prior to disposal.

6.5 CERTIFICATION OF PERSONNEL: Contractor personnel performing work or having inspection responsibilities pertaining to CCs, shall be certified to the appropriate professional level as outlined in the applicable national standards, best commercial practices, or as contractually required. A system for tracking personnel certification shall be an element in the contractor internal audit program to assure all certifications are maintained in a current status.

6.6 TOLERANCE OF MEASURING & TEST EQUIPMENT (M&TE): M&TE used to inspect FSPs must be discriminate to within ten percent of the total tolerance spread for the feature being inspected except as follows: for total tolerance spreads of less than .001, M&TE must be discriminate to twenty percent of the spread.

6.7 SERIALIZATION: All FSPs require individual serialization or identification by lot number for traceability. The contractor shall request either approval of or assignment of a block of serial numbers (S/Ns) by ATCOM. Serialization shall occur so that any individualized inspection/process that involves a CC is traceable to a specific S/N. All S/Ns approved for issue or provided by ATCOM shall be accounted for; this includes material scrapped during manufacturing. Serial Numbers used in this program shall not be used on any other part manufactured by that contractor. Reporting of S/Ns to the PCO shall be in accordance with contractual requirements.