
Flight Safety Part Program

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1. PURPOSE & SCOPE

This document defines unique requirements for suppliers and their sub-tiers for the control of Flight Safety Parts (FSP). It supplements but does not replace other RTX Business Entity requirements.

Note: *Process Sheets / Supplier Documentation previously approved by RTX Business Entities need not be re-submitted, for new approval, until such time as the supplier's process / documentation is revised.*

* 2. APPLICATION

Supplier quality requirements defined in this document are agreed upon by and applicable to the following RTX Aerospace Business Entities (also known as Members):

Pratt & Whitney	PW
Pratt & Whitney Canada	PWC

Note: *These identifiers include all Original Equipment Manufacturing (OEM) and Aftermarket Operations (AO).*

The requirements of this document apply when the PW drawing includes the statement "Flight Safety Part" above the title block on sheet 1 of the drawing, and when the PWC drawing includes the statement "ENSIP Critical Part", or "Critical Rotating Part" or "Critical Part" or "Safety Significant Item" above the title block on sheet 1 of the drawing.

3. DEFINITIONS

- * **3.1 Flight Safety Part (FSP):** For the purpose of this document the term Flight Safety Part (FSP) is synonymous with:
- PW Flight Safety Part (FSP)
 - PWC Critical Rotating Part
 - PWC Critical Part
 - PWC Engine Structural Integrity Program (ENSIP) Critical Part
 - PWC Safety Significant Item

3.2 Critical Characteristic (CC): Any dimension, finish, material, installation, assembly, manufacturing or inspection process or other mechanical feature or electrical attribute of a FSP which, if nonconforming, could result in an unsafe condition.

For the purpose of this document the term critical characteristic is synonymous with:

- PW Flight Safety Characteristics (FSC)
- PWC ENSIP Critical Location (ECL)

3.3 Unsafe Condition – A condition that can result in effects that may result in the potential for loss of, or damage to, aircraft, major aircraft systems, injury to aircraft occupants or ground support personnel. These conditions are such as, but not limited to:

- Non-containment of high energy debris
- Uncontrolled fire
- Concentration of toxic products in the engine cabin bleed air
- Significant thrust in the opposite direction to that commanded by the pilot
- Failure of the engine mount system leading to engine separation
- Complete inability to shutdown the engine.
- Uncommanded engine shutdown for single engine applications (Where applicable)
- Non-recoverable stalls for single engine applications (Where applicable)
- Hot gas impingement on critical airframe structures (Where applicable)
- Release of the propeller by the engine, if applicable.

4. REQUIREMENTS

4.1 General FSP Identification

4.1.1 FSPs are identified on the drawing, drawing related documents or Purchase Order (PO).

Notes:

- *For PW FSPs, CC is designated by FSC in a racetrack (FSC)*
- *For PW FSPs, some FSCs may also be designated as KPC1 as defined in PWA 79345.*
- *For PWC ENSIP Critical Parts, all CCs are identified on the drawing as an ENSIP Critical Location (ECL).*
- *For PWC some FSCs will also be designated KPC1 as defined per CPW153*

4.1.2 For “make to print” parts There are no additional requirements related to the FSC racetrack other than those for PW-QA-6100 and PWA 79345 or CPW 153, and as defined in this document. For PW there may also be FSC racetracks on the QAD for the drawing.

The features designated as flight safety characteristics (FSCs) will also appear on the IDS with the other Key Characteristics and will have an Impact of Safety and/or a Severity of 9 or 10.

4.1.3 For supplier designed parts, the supplier and the applicable Member Engineering organization jointly identify the FSP and CCs.

4.1.3.1 Supplier shall identify CCs with a method approved by the Member on the detail part and assembly drawings and then submit to the applicable Member Engineering organization for approval.

***Note:** The applicable Member Engineering organization identifies the FSP CC on their procurement control drawings.*

4.1.3.2 After CC identification, suppliers shall ensure that applicable CC data is incorporated into their maintenance instructions.

4.2 Process Control

- * **4.2.1** For any process that affects a CC, the supplier shall:
- Provide traceability to the source by maintaining a list of sub-tier sources, including special process sources utilized in the manufacturing / processing / inspection of CCs.
 - Identify the facility location where work is performed.
 - Identify the manufacturing and inspection process operations, (i.e., feeds, speeds, equipment, tools and gages) to the extent required by the Member.
 - Ensure only sources qualified / approved by the Member are used for special processes. Other processes that affect CCs may be subject to approval as required by the Member.
 - Identify documents related to a PWC FSP identified as a “Critical Rotating Part”, “Critical Part” or “ENSIP Critical Part” as applicable. Such documents include at a minimum:
 - Operation sheets
 - Purchase Orders (PO)
 - Inspection records
 - Shop travelers / routers
 - Obtain Member initial approval for the process prior to initial delivery and all subsequent changes prior to delivery.
- * **4.2.2** When subcontracting any operation that affects CCs, supplier shall ensure that the PO to the sub-tier supplier identifies the part as a “Flight Safety Part”,

“Critical Rotating Part”, “Critical Part” or “ENSIP Critical Part”, (as applicable), and invokes ASQR-09.1.

4.3 Process Documentation

4.3.1 Process documentation shall be written and maintained in English as specified in ASQR-01.

- * 4.3.2 Operation sheets / inspection checklists or equivalent shall include the following:
- a) Acknowledgement of a PWC FSP by identification that the associated part is a “CRITICAL ROTATING PART”, “CRITICAL PART” and/or “ENSIP CRITICAL PART”, (as applicable) contains Critical Characteristics, and/or critical processes and cannot be revised nor alternate material cannot be used, without prior written approval from PWC.
 - b) Identification of all CCs or critical processes or inspections using a method approved by the Member. If no specific characteristic is identified on the drawing, all operations are considered critical.
 - c) Supplier company name and location.
 - d) Part number and revision letter.
 - e) Provisions for recording CC inspection results including variable data for characteristics designated as critical per ASQR-20.1.
 - f) Inspection method(s) and equipment used for CC inspections including supplier’s sub-tier work instruction that affect CCs by number and revision.
 - g) Equipment used during manufacture of a FSP that affect CCs including but not limited to machines, tools, gauges, and fixtures.
 - h) Name and location of all sub-tier suppliers performing operations that affect CCs noted in the appropriate step of the operation sheet.
 - i) Reference(s) to drawing notes. When drawing notes are identified by a method approved by the Member, the text of the note shall be included.

4.4 Initial Process Approval

Operation sheets and / or inspection checklists for operations that affect CCs shall be submitted for approval to the appropriate Member per PO requirements.

Note: *Approval may require on-site source/part/process verification as determined by Member.*

4.5 Process Revisions

4.5.1 Changes (including changes to sequence of operation) made to an operation sheet, inspection checklist or related approved documentation shall be submitted to the Member per PO requirements for review and approval prior to incorporation. Approval may require on-site evaluation as determined by the Member.

4.5.2 When relocating a process, within a facility or to a different facility, prior notification of the relocation to the Member is required. Approval may require on-site evaluation as determined by the Member.

4.6 Process Approval Notification

Suppliers will be notified of process approval by the applicable Member form.

4.7 Manufacture of Flight Safety Parts

Manufacture and inspect parts in accordance with approved process sheets including sequencing of all operations and steps within those operations. Deviations from the approved process are not allowed.

4.8 Part Traceability

4.8.1 Parts shall be identified at the earliest possible opportunity in their manufacturing process to maintain traceability. Documents shall provide traceability throughout the manufacturing process.

4.8.2 When specified by the forging drawing or any other purchaser document, the supplier's traceability procedure and records shall ensure each forging can be tracked to its original:

- forging lot
- heat treat batch
- location within the billet / bar
- location of the billet / bar relative to the entire ingot / heat

4.9 Inspection

4.9.1 Inspection plans for finished parts or assemblies shall be in accordance with the requirements of ASQR-20.1.

4.9.2 ASQR 20.1 applies to all CCs (i.e. ECL, FSC, KPC1) for product acceptance.

4.9.2.1 Characteristics with the ECL designation or both ECL and FSC designations, shall be treated as Critical characteristics.

4.9.2.2 Characteristics with the KPC1 designation or both KPC1 and FSC designations, shall be treated as Critical characteristics.

4.9.2.3 Characteristics with the FSC designation and no KPC designation, shall be treated as Critical characteristics. When PPAP Full Approval is obtained, these characteristics shall be treated as Minor characteristics.

4.9.3 Supplier inspection personnel accepting CCs shall be designated by the Member.

4.9.4 Perform and document all First Article Inspection (FAI) per SAE AS9102 as required by ASQR-01. Inspections of CCs shall be performed by an inspector designated by the Member. A Member may perform an on-site validation of the FAI.

4.9.5 Product acceptance and release subsequent to FAI shall be per PO or Member requirements. FSPs or services that affect CCs require, for each shipment, documentation of the revision letter / date of the approval process used.

4.10 Sub-tier Supplier Audits

4.10.1 Audit of NDI/NDT sources will be the responsibility of the Member.

4.10.2 Except for Nondestructive Inspection (NDI) / Nondestructive Testing (NDT), suppliers shall conduct annual "on-site" audits at all sub-tier sources involved in the manufacturing / processing of FSPs.

4.10.2.1 These audits shall be conducted and documented per applicable Member audit checklist. Reports shall be made available for review by Members, upon request.

4.10.2.2 Audits are not required when the sub-tier source can provide documented evidence that a Member FSP audit of their facility has been conducted within the past 12 calendar months.

4.11 Early Alert Notification

4.11.1 In the event a significant issue (e.g., NDI indications, metallurgical or chemical non-conformance, parts manufactured to other than the approved process, etc.) has occurred, the supplier must notify the applicable Member representative in writing within 24 hours as to the nature of the issue.

4.11.2 Early Alert notification shall be generated for issues whether or not they affect CCs and shall provide sufficient detail to allow for segregation of any potentially affected hardware pending a comprehensive investigation. Ref: ASQR-01.

5. RECORDS/FORMS

5.1 Completed Quality records generated electronically or on paper and associated hardware used for quality system acceptance, shall be retained per the requirements of ASQR-01.

* **5.2** Maintain records of CCs inspection results including recording of variable data where applicable.

5.3 When a supplier of CC items is going out of business or no longer intends to manufacture the part, the supplier must notify all applicable Members for instructions with respect to records.

* **6. REFERENCES**

6.1 It is the responsibility of the supplier to obtain copies of non-RTX documents specified herein. These include, but may not be limited to the following:

Document	Title
SAE AS9102	Aerospace First Article Inspection Requirements
AS9145	Aerospace Series - Requirements for Advanced Product Quality Planning and Production Part Approval Process
SAE AS13100	AESQ Quality Management System
SCMH 7.2.16	Key Characteristic Traceability Form
MIL-STD-1629A	Procedures for performing a FMECA
SAE-ARP4761	Guidelines And Methods for Conducting the Safety Assessment Process on Civil Airborne Systems And Equipment
AESQ RM13004	Defect Prevention Quality Tools to Support APQP & PPAP

- 6.2** Member specifications needed, shall be requested from the applicable Member's Procurement organization. Documents referenced in this specification include but may not be limited to:

Document	Title
ASQR-01	Aerospace Supplier Quality Requirements
ASQR-01 Chapter B	9145 – Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP) - AESQ Supplemental Requirements
ASQR-09.2	Production Part Approval Process (PPAP)
ASQR-20.1	Supplier Sampling Requirements
PWA 370	Engineering Source Approval
PWA 79345	Management & Classification of Key Product Characteristics
CPW 135	Engineering Source Approval
CPW 138	ENSIP Critical Parts
CPW 153	Management & Classification of Key Product Characteristics
PW-QA 6100	Production Part Approval Process

* Revised

7. NATURE OF CHANGE

This document has been revised. Major changes include the following:

- Revised UTC letterhead (header), proprietary statements (footer) with RTX
- Throughout document removed references to Hamilton, Collins, Sikorsky
- In Para 2 and 3.1, added Safety Significant Item.
- In para 3, revised definitions of FSP to focus on PWA/PWC only
- Added Para 3.3 to provide definition of Unsafe Condition
- In para 4.1.1 - Clarified designation of Critical Characteristics, including removing reference to the 5 pointed black star and reference to HS and Sikorsky requirements
- In para 4.1.2 - added more details relative to supplier designed parts
- Removed references to Prime Reliable Part (Throughout)
- In para 4.2.1 - revised requirement to identify manufacturing documents for FSPs. (Item e) to be applicable to PWC only. Same change in 4.3.2 a.
- In para 4.3.2 i - removed reference to black star.
- Replaced original para 4.9.2 (sampling per ASQR 20.1) with description of how to determine if features are critical or minor for purposes of sampling per ASQR-20.1
- In para 4.10 and subs – revised requirements for sub tier audits related to NDT/NDI
- In Para 6.1 – added several industry documents
- In Para 6.2 - removed HS and Sikorsky documents and added reference to CPW 153 (KPC), CPW 135 (ESA), CPW 138 (ENSIP Critical Parts)
- Removed the Addendum for PW specific requirements. A significant revision is that the PW addendum Para 1 statement that “FSP applies when QAD specifies ... DCS 178” is replaced by para 2. Statement “The requirements of this document apply when the PW drawing includes the statement “Flight Safety Part” above the title block on sheet 1 of the drawing, and when the PWC drawing includes the statement “ENSIP Critical Part”, or “Critical Rotating Part” or “Critical” on the drawing.
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