AEROSPACE SUPPLIER QUALITY REQUIREMENTS (ASQR-01)

INTRODUCTION

This document defines supplier quality requirements as agreed upon by the following business entities herein referred to as "Member".

Member	Abbreviation	Applicability
Collins Aerospace	Collins	For Collins Aerospace Supplier Quality requirements, refer to your purchase order (PO).
Pratt & Whitney	PW	See below
Pratt & Whitney Canada	PWC	See below

This document has been developed based upon the requirements of the International Aerospace Quality Group (IAQG) AS/EN/JISQ 9100 - Quality Management Systems - Requirements for Aviation, Space and Defense Organizations.

When a supplier provides product or services to (together: "P&W") PW or PWC.

Note: *For guidelines on implementing supply chain best practices, reference IAQG Supply Chain Management Handbook (SCMH) and AESQ (RM) Reference Material.*

REVISION SUMMARY

This document has revised to:

1. Correct a typo in section 4.3.5 to 4.3.3
2. Removed AC7004 call out from special process section.
3. Updated 7.5.3.5.2 NDT retention times.
4. Removed Collins Chapter 1 requirements as they were consolidated into COL-ASQR-PRO-0003 (Aerospace Supplier Quality Requirements) which can be accessed here.

QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS FOR P&W

1. SCOPE

The requirements of this document apply to all Organizations that furnish product, material, processes, or product related services to P&W as a contractual requirement regardless of Organization's industry, regulatory accreditation, or certification status, and each Organization shall be responsible for ensuring that all members of its supply chain comply with the requirements set forth herein.

*Note: In this document the term, **"Organization"** refers to companies receiving a PO directly from P&W and the term **"Supplier"** refers to companies at a lower level providing product or services to Organizations.*

2. INFORMATIVE REFERENCES

2.1 It is the responsibility of the Organization to obtain the latest revisions of all documents specified by this ASQR. These documents include, but may not be limited to, the following:

Table I: Documents Referenced in ASQR-01

Document	Title
AS9100*	Quality Management Systems – Requirements for Aviation, Space and Defense Organizations
AS13100	AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations
ASQR-07.5	Control of Software
ASQR-09.1	Flight Safety Parts Program
ASQR-20.1	Supplier Sampling Requirements
IATF 16949	Quality Management System
ISO 9001	Quality Management
ISO 10012	Measurement Management Systems – Requirements for Measurement Processes and Measuring Equipment
ISO 17025	General Requirements for the Competence of Testing and Calibration Laboratories
Nadcap AC 7004	Nadcap: Quality Management System

**Developed under the auspices of the IAQG and listed here as SAE International "AS" publications. Equivalent versions may be published by other standards bodies (e.g., European Committee for Standardization (CEN), Japanese Standards Association/Society of Japanese Aerospace companies (JSA/SJAC).*

3. TERMS AND DEFINITIONS

Distributor

Organization carrying the purchase, storage, splitting, and sale of products and not transforming, assembling, or otherwise modifying purchased product. Distributors are limited to raw material, industry standard, and Commercial-Off-The-Shelf (COTS) parts.

Note: *Suppliers that do perform per above but in addition purchase parts from third parties manufactured against P&W-proprietary drawings shall not be considered as Distributors.*

Input Data Sheet (IDS)

A summary completed by the RTX Member or Design Responsible Supplier to communicate Key Characteristics as defined by the output of the Design Risk Assessment.

Operator Certification

A method whereby an Operator, with the required training, has the capability to determine the acceptability or non-acceptability of parts they produce and/or inspect.

RTX Qualified Distributor List (RTX QDL)

The list of Distributors that are qualified by RTX to provide metals, electronics, and hardware.

Note: *Electronics include electrical, electronic, and electro-mechanical components (e.g., connectors, wire, electronic components, terminals, lugs, pc boards, semiconductors). Hardware includes fasteners (e.g., nuts, bolts, rivets, washers, pins, screws, clamps, springs, seals, O-rings, ferrules, fittings). Metals include metallic raw materials (e.g., bar, sheet, plate, tube, wire, forging, casting, billet, ingot).*

Temporary Key Characteristic (TKC)

TKC's are applied to features subject of a dimensional escape and require short-term data collection and usage of process control tools as a means to validate the effectiveness of the corrective action submitted by Organizations.

4. QUALITY MANAGEMENT SYSTEM (QMS)

Supplier receiving a purchase order from P&W shall comply with the requirements of AS13100 and ASQR-01. The following P&W company-specific requirements are aligned to the numbering scheme of AS9100 and AS13100.

Note*: Where Reference Material documents (e.g. RM13004, RM13145) are referred to in AS13100, the contents of those Reference Material documents are not to be interpreted as establishing additional requirements to AS13100.*

4.3.1 Determining the scope of Quality Management System – Supplemental Requirements

The wording of AS13100 Section 4.3.1 paragraph 3 is replaced by, "The customer shall be notified in a timely manner of any significant changes per the notification requirements of AS13100 and this document."

The Organization shall comply with the latest revisions of ASQR, P&W-specific quality system requirements, and other documents referenced herein. The Organization shall establish compliance within 60 days of the document effective date unless otherwise specified in the P&W publication notification.

4.3.2 (Deliverable Software)

The requirements of AS13100 Section 4.3.2 are hereby replaced with the following requirement: the Organization shall comply with the requirements of ASQR-07.5 when providing Deliverable Software.

> ***Note**: Definitions of Software are contained in ASQR-07.5.*

4.3.3 Table 2 QMS Certification Requirements

Organizations receiving a purchase order from P&W and their Suppliers shall meet the requirements of AS13100 Table 2.

Exceptions to the above are the following:

- Type 1: Make to Print and Type 2A: Design and Manufacture suppliers (i.e., suppliers to Organizations) shall only need to be compliant to 9100, not registered.
- AS13100 Table 2, Type 3 Distributors shall be certified to AS/EN/JISQ 9120, AS/EN/JISQ 9100, ISO 9001, or IATF16949:2016.
- Type 4: Special Process Suppliers shall be certified to AS/EN/JISQ 9100 or Nadcap AC7004.

Distributors of metals, electronics, and hardware in the supply chain shall be on the RTX QDL.

Distributors not on the RTX QDL (to include lower-tier suppliers) shall use ASQR-01 Form 9 to request and obtain approval prior to delivering parts to Organizations and/or P&W.

Per 13100 Table 2 “QMS Certification Requirements” the QMS Approval requirement for Type 4: Special Process Organizations is replaced with the following: Organizations and Suppliers that only provide the following special processes on P&W products shall be certified to the appropriate Nadcap commodity and scope.

- Chemical Processing
- Coatings
- Heat Treating
- Materials Testing Laboratories
- Nonconventional Machining and Surface Enhancement
- Nondestructive Testing
- Welding

All other Organizations and Suppliers providing special processes on P&W products shall be certified to AS/EN/JISQ 9100 or Nadcap AC7004.

For AS13100 Table 2, “QMS certification requirements”, the certification requirement for External Calibration or Laboratory Service Providers (i.e., Nadcap Materials Testing Laboratories) is

replaced with: “ISO/IEC 17025, ISO 10012, Nadcap AC7004, or by signatories to the International Laboratory Accreditation Cooperation (ILAC)”.

7. SUPPORT

7.1.5.1 Monitoring and Measuring Resources - General

Significant-Out-Of-Tolerance (SOOT) condition is defined as an M&TE out-of-tolerance condition that either (a) exceeds 25% of the product tolerance (the maximum acceptable level of deviation from a product’s specification, measurements or standards), or (b) when measured error of the M&TE is greater than two times the calibration tolerance (the maximum acceptable deviation between the known standard and the calibrated device) when product tolerance is not known.

When M&TE is identified as SOOT, the supplier shall:

- Document the SOOT results in calibration records.
- Assess impact of the SOOT condition on product inspected with the SOOT M&TE since its last non-SOOT calibration.
- Notify P&W within 24 hours if it is determined that impacted parts could have been shipped (see section 10.2.3)
- Ensure corrective action measures to eliminate the SOOT condition and minimize product risk. Such measures may include but are not limited to
    - Adjustment or repair or replacement of M&TE
    - Review of future use of similar M&TE
    - Review of conditions that may have caused SOOT (e.g. improper usage, storage, or maintenance)
    - over inspection of potentially impacted production hardware

7.1.5.1.3 Confirm Acceptance - Supplemental Requirements

When performing Measurement System Analysis (MSA), the Organization shall comply with the requirements of AS13100 Table 4 MSA Acceptance Limits, with the following exception: The acceptable Gage Repeatability and Reproducibility (R&R) for all Characteristic Categories is ≤ 20%.

7.2.3 Delegated Product Release Verification (DPRV) Representative Training – Supplemental Requirements

DPRV personnel (Delegated Quality Representative (DQR) for P&W) shall be certified per the requirements of Supply Chain Operating Procedure (SCOP) SCOP DQR.

7.5.3.5 Documented Information Retention Periods – Supplemental Requirements

Retention periods shall be calculated based on the date of manufacture (i.e., AS13100, Section 7.5.3.5 Paragraph 2 does not apply to P&W products).

7.5.3.5.2 Original nondestructive evaluation/testing process related records

Section 7.5.3.5.2 of AS13100 is hereby replaced with the following requirement:

Original nondestructive evaluation/testing process-related records (e.g. radiographic film & images and electronic sonic scan data sets) shall be maintained, in accordance with the retention period specified in Table II.

Electronic sonic data used for part acceptance shall be retained per Table II. This would include any additional scans used to assess part acceptance as well as all scan segments mandated by the technique sheet.

Table II. with below retention period for retained documented information

Time Period (from date of manufacture)	Part Type
40 years	Flight Safety Parts, Safety Parts, Flight Critical Parts as defined in ASQR-09.1, rotor grade billet
10 years**	All other except industry standard parts
5 years**	Industry Standard Parts

(** physical radiographic films on non-serialized parts are only required to be retained for 2 years)

8. OPERATION

8.1.3.1 Product Safety Supplemental Requirements

Organizations supplying Flight Safety Parts shall comply with the requirements of ASQR-09.1.

> ***Note:*** *Some P&W-specific designations for Flight Safety Parts are: PW Flight Safety Part (FSP), PW Prime Reliable Part, PWC Critical Part, PWC Critical Rotating Part, PWC Engine Structural Integrity Program (ENSIP) Critical Part.*

8.1.3.2 Product Safety

The Organization shall ensure that regular Product Safety communication is made to internal employees and external providers to ensure all individuals understand their contribution to product and service safety and its importance to overall product safety.

8.2.1.1 Customer Communication – Supplemental Requirements

The Organization shall adhere to P&W form submission instructions (e.g., web-based, email) for each form listed in Table III.

The Organization shall submit ASQR-01 Form 3 for all formal communications as defined by PW and PWC, and requests with respect to RTX and P&W-specific quality requirements unless otherwise listed in Table III.

ASQR-01 Form 3 is used for items such as:

Clarification, interpretation, or identified error with a drawing, specification, or requirement.

A request for an approval to use an alternate method to comply with an RTX and/or P&W quality system requirement (use of an alternate method is not permitted without prior P&W approval)

Note: *ASQR-01 Form 3 is used for communication only. It is not used for disposition of product non-conformances.*

Table III: Organization Communication Forms

Form	***Name***
ASQR-01 Form 3	*Supplier Request for Information*
ASQR-01 Form 4	*Supplier Work Transfer Request*
ASQR-01 Form 5	*Compliance Gap Analysis*
ASQR-01 Form 6	*Notification of Potential Quality Escape*
ASQR-01 Form 7	*Delegated Quality Representative (DQR) Candidate Application*
ASQR-01 Form 8	*Letter of Agreement, Delegated Quality Representative Program*
ASQR-01 Form 9	*RTX-Distributor Request*

8.4.2.1 Type and Extent of Control – Supplemental Requirements

AS13100 Section 8.4.2.1 Paragraph 4 is replaced by the following: The Organization shall ensure that the counterfeit part prevention process includes a mechanism for reporting counterfeit parts to the organization's purchasing representative within 24 hours of it being confirmed.

When required by P&W, the Organization shall notify P&W via ASQR-01 Form 4 prior to any planned work transfers (e.g., from one Organization facility to another, from the Organization to a member of its supply chain, from one member of its supply chain to another). When required by P&W, prior approval is required. P&W reserves the right to require additional substantiating data or quality controls.

8.5 Release of Product and Services

When specified by P&W, the Organization shall use the P&W online system to capture production process verification data (e.g., PPAP, FAI) and audit data.

8.5.1.1 Control of Equipment Tools and Software programs

The Software Quality Assurance program requirements of AS13100 Section 8.5.1.1, are replaced by the following: Organization shall comply with the requirements of ASQR-07.5 when utilizing non-deliverable software such as, Manufacturing, Test, Inspection or Support Software.

Note*: Definitions of Software are contained in ASQR-07.5*

8.5.1.4.1 Control of Product and Service Provision – Supplemental Requirements

The use of handheld spectrometry devices, or equivalent, to verify 100% of material input at the part manufacturer only applies if required by P&W.

8.5.1.4.3 Control of Product and Service Provision – Supplemental Requirements

AS13100 Section 8.5.1.4.3 Bullet 3, is replaced by the following: Unless otherwise specified, the lighting intensity for inspection where visual acceptance is performed shall be 100 foot candles or 1076 LUX minimum, measured at the inspection surface of the part.

8.5.1.5 Product Process Verification – Supplemental Requirements

Upon request of P&W, Organizations shall compute PFMEA risks using the Action Priority method. (see RM13004 for the preferred Action Priority method).

8.5.1.6 First Article Inspection (FAI) –Supplemental Requirements.

The following is added to bullet #4:

- If part marking re-approval is required when process changes occur that may impact the accepted conditions on the original part marking approval.

  Note: *On an exception basis where part marking process changes affect a group of parts, with prior approval from P&W, part family/grouping validation may be acceptable.*

  Note: *Where part marking changes are related to a new revision of the part, and with submission of an appropriate photo for archive purposes, a side-by-side inspection could be used for validation purposes.*

The following is added as bullet #9:

- Include a replication of product part marking (e.g., photograph or sample) that represents production marking within the FAI Report.

  Note: *To ensure correct part marking, approval can be obtained from P&W prior to FAI submission.*

8.5.1.9 Appointment of Competent Person, Including Any Required Qualification – Supplemental Requirements

The Organization shall request and obtain approval for the use of an Operator Self-Verification Program – also known as Operator Certification Program - or special manufacturing methodologies (e.g., manufacturing controlling features, die/mold control and method of manufacturing) from P&W using ASQR-01 Form 3, unless otherwise specified.

9. PERFORMANCE EVALUATION

9.1.1.2 Alternate Inspection Frequency Plan

Product acceptance inspection shall be 100% for all characteristics unless the Organization meets to the requirements of ASQR-20.1.

Alternate sampling plans as defined in ASQR 20.1 and sampling plans requiring Customer approval per ASQR 20.1 shall be submitted for approval using ASQR-01 Form 3. Documented P&W approval is required prior to implementation.

> *Note: Any alternate sampling plan outlined in RM13002 is considered an alternate sampling plan and requires P&W approval prior to implementation.*

9.2.3 Internal Audit – Supplemental Requirements

The Organization shall determine their Audit Plan per AS13100 Section 9.2.3. Requirements stated in Table 9 Internal Audit Types and Frequency - for Production Process and Product Audits, the requirements of Table 9 are replaced with the following: Organization shall ensure that Product and Production Process Audits are incorporated into the Organization's annual risk analysis (see AS13100 Section 6.1.3).

10. IMPROVEMENT

10.2.3 Problem Solving Methods for Customer Escapes - Supplemental Requirements

10.2.3.1 Corrective Action Verification

The Organization shall inform P&W using ASQR-01 Form 6 within 24 hours upon discovery of suspect non-conforming product having been shipped regardless of destination.

Upon implementation of corrective action, to ensure effectiveness, the Organization shall have a documented process in place to ensure that 100% over-inspection (i.e., additional independent measurement of the affected characteristic(s)) is performed of the deviated characteristics for a-minimum of the next three consecutive manufactured lots (quantities of parts produced under conditions that are considered uniform) unless otherwise specified by P&W.

10.2.3.2 Temporary Key Characteristics

P&W reserves the right to assign TKC's to parts in the event of a dimensional escape with the purpose of validating the effectiveness of the Organization's corrective action. TKCs shall be treated in the same manner as more permanent KC's (e.g. KPC1, KPC2, IDS KC, KPC-M) as defined in this document. In the event a TKC is deployed, P&W may require the Organization to:

Conduct a Gage Repeatability & Reproducibility study per RM13003 with the goal of achieving a Percent-To-Tolerance Ratio </= 20%.

Conduct a short-term Process Capability Study (Ref RM13006) by collecting a minimum of 25 consecutive pieces over two different manufacturing lots, demonstrating on a SPC control chart statistical control, and achieving a Cpk >/= 1.33. Unless otherwise approved by P&W, once these thresholds are met all TKCs are removed, and the Organization's corrective action is considered to have been validated.

AS13100 Chapter B: 9145 – Advanced Product Quality Planning (APQP) and Production Part Approval Process (PPAP) - AESQ Supplemental Requirements

Organizations shall comply with the requirements of AS13100 Chapter B and C when PPAP is invoked pursuant to a Purchase Order (PO) or any other contractual document issued by the P&W. (e.g. PW - QA 6100, PWC - PO clause).

17. (5. - 9145) PRODUCTION PART APPROVAL PROCESS (PPAP) REQUIREMENTS

17.1 P&W-specific submission requirements for PPAP

The Organization shall submit a PPAP project plan (reference AS9145 Section 4.3 Phase 1 Requirements - Planning) with the commit dates to complete each PPAP Element to their P&W Member Focal Point (MFP) for approval within 15 business days of P&W Purchase Order issuance. Failure to meet these commit dates may result in revoking the ability to ship hardware and require submission of new dates with a detailed justification.

The Organization shall submit all PPAP planning & objective evidence utilizing P&W's electronic system/PPAP software application. In the event the software system is not available, the Organization shall contact their P&W MFP for submission requirements.

The PPAP requirement is applicable to all members of the supply chain. The Organization shall flow down the requirements of PPAP to all levels of the supply chain (internal and external) and maintain records of their compliance. A risk-based decision process may be used to assess PPAP applicability of supply chain components and operations when approved by P&W. Any risk-based process used to determine applicability of PPAP to any level of the supply chain shall be documented and approved by the MFP. Upon a satisfactory internal review, the Organization shall submit all approved PPAP Approval Forms and objective evidence from all levels of its supply chain.

The Organization shall initiate a deferral request at the time that it is identified the planned PPAP timing cannot be met via the P&W online PPAP software application or using the ASQR-09.2 Form 1 and PPAP Deferral Form (ASQR- 09.2 Form 2), attaching a PPAP Element 9 (FAIR) and Element 10.1 (Part Marking Approval) to authorize the shipment of production parts prior to achieving Full or Interim Approval.

> *Note: Reference 9145 Section 5.4 for PPAP resubmission based on product or process changes.*

17.2 Production Part Approval Process File and Submission

The PPAP File shall:

- Be part number specific. With prior approval some elements may be satisfied using a part or process family methodology with all unique characteristics accounted for, with approval from P&W:
    - 2 Design Risk Analysis (DRA)
    - 3 Process Flow Diagram (PFD)
    - 4 Process Failure Modes and Effects Analysis (PFMEA)

    - 5 Control Plan
    - 6 Measurement Systems Analysis (MSA)
    - 8 Packaging, Preservation and Labeling Approvals
- Be maintained by the Organization at the manufacturing location
- Be maintained with all applicable items up-to-date and represent the current production process regardless of whether P&W requests a formal submission
- Contain copies of all PPAP approvals including objective evidence

When PPAP requirements have not been completely fulfilled, the Organization may submit the PPAP Package and partially completed Elements for review. Elements identified as incomplete shall contain an action plan to achieve closure of any open item(s) including the commitment of actions, target dates, and owners to achieve Full Approval.

The Organization shall obtain authorization via the P&W online PPAP software application or the MFP via ASQR-09.2 Form 1 with the following possible PPAP dispositions:

- Full approval
- Interim A approval
- Interim B approval
- Rejected (not authorized to ship)

Interim B approval indicates a gap between the PPAP requirements and the Organization's current status on the following Elements:

- 2 – Design Risk Analysis (DRA)
- 4 – Process Failure Modes and Effects Analysis (PFMEA)
- 6 – Measurement Systems Analysis (MSA)
- 7 – Initial Process Capability Studies
- 9 – First Article Inspection Report (FAIR)
- 10.2 – Production Process Run(s)

Interim A approval indicates a gap between the PPAP requirements and the Organization's current-status on the following Elements:

- 7 – Initial Process Capability Studies
- 10.2 – Production Process Runs

Interim approval expires with the PPAP plan date for Interim A and/or Full approval. A new submission or updated commit dates dispositioned by the MFP is required to continue shipment of production parts.

The Organization shall initiate a deferral request at the time that it is identified the planned PPAP timing cannot be met via the P&W online PPAP software application or using the PPAP Deferral Form (ASQR- 09.2 Form 2), attaching a PPAP Element 9 (FAIR) and Element 10.1 (Part Marking Approval) to authorize the shipment of production parts prior to achieving Full or Interim Approval.

***Note**: Deferrals are only approved on a very limited basis.*

A deferral shall contain a detailed justification with the reasoning PPAP approval cannot be met at that time, the need for the deferral, and an action plan for meeting PPAP requirements. All deferral requests must be accepted and concurred with by the MFP, Quality, and Procurement leadership.

Where there are current technology limitations or it is prohibitively expensive to satisfy the process stability, process capability, and/or production yield requirements of this section, the Organization

shall submit a request for exception via the online PPAP system. P&W-specific forms may be used in the event the online system is not available.

> ***Note**: Requests for exemptions are only available for Initial Process Capability Studies and Production Process Run(s) Elements.*

The Organization shall review applicable Elements as part of any corrective action (e.g., QNs, escapes, P&W/Certification Body/Regulatory audit findings, negative trending of Cost of Poor Quality, Product KC (e.g. KPC1, KPC2, IDS KC) and Process KC (e.g. KPC-M)) to determine the impact and update affected Elements where appropriate as per 9145 Section 5.4. (Reference AS13100 & RM13000)

17.2.3 Production Part Approval Process File and Submission - Supplemental Requirements

Table 13 - AESQ PPAP elements requirement

PPAP ELEMENT 6: Measurement System Analysis - Supplemental Requirements

Gage Repeatability & Reproducibility (Gage R&R) studies shall have a Precision-to-Tolerance (P/T) ratio of ≤ 20% unless a lower maximum ratio is required by P&W.

Where attribute data is used to assess feature acceptability (e.g., pass/fail criteria), the following criteria shall be used to determine acceptance of the measurement system: Pass/Fail: Attribute agreement ≥ 90% or Kappa ≥ 0.8

PPAP ELEMENT 10: PW SPECIFIC REQUIREMENTS: Part Marking Approval

The Organization shall document all part marking requirements are met by obtaining approval from P&W.

PPAP ELEMENT 10: PW SPECIFIC REQUIREMENTS: Production Process Run(s):

A Production Readiness Review (PRR) should be completed prior to the Production Process Run to verify that the manufacturing process is documented and ready for production while operating at the customer demand rate. Upon P&W request, the Organization shall record and submit the results of the review, including corrective action to resolve any identified risks or issues.

The Production Process Run(s) shall be performed at the intended production site(s) under production conditions (i.e., tooling, gauges, processes, sequence, operations, instructions, materials, personnel, environment) to demonstrate the ability to satisfy P&W requirements.

The Organization shall track and document the defect rate of all parts produced during the Production Process Run.

Subsequent to the complete FAIR the Organization shall perform and document one additional dimensional report (AS9102 Form 3 or equivalent form may be used) at the end of the Production Process Run yielding 25 consecutive pieces with no QNs.,

The following acceptance criteria for the evaluation of the Production Process Run results shall be applied.

Table 2

Approval Level	Results	Interpretation
Full	Minimum 25 consecutive parts with no QNs and second dimensional report	The process satisfies the acceptance criteria.
Interim A	90% part yield. Minimum 25 samples	The process does not meet the acceptance criteria. The Supplier shall implement Corrective Action as necessary and continue data collection.
Interim B	FAIR with data from any additional parts available at time of submission	

18. AESQ SUPPLY CHAIN RISK MANAGEMENT PROCESS - SUPPLEMENTAL REQUIREMENTS

The requirements of AS13100 Section 18 are presented as a best practice and not mandatory deliverables for P&W.

21. KEY REQUIREMENTS FOR THE DEPLOYMENT OF QUALITY PLANNING TOOLS – SUPPLEMENTAL REQUIREMENTS

21.8 Initial Process Capability Studies - Supplemental Requirements

The following acceptance criteria for the evaluation of initial process study results shall be applied:

> ***Note**: Data collected from development or pre-production parts can be considered, provided the same tooling, equipment, and processes intended for production are used.*

Table 1

Approval Level	Results	Interpretation
Full	IDS KC: Cpk > 1.33 Process KC: Cpk > 1.00 Attribute: 45 in a row with no QNs	The process satisfies the acceptance criteria. The Supplier shall determine acceptability of Supplier defined process KCs based on internal requirements
Interim A	IDS KC: Cpk > 1.00 Process KC: Cpk > 1.00 Attribute: Yield > 90% Minimum 25 samples	The process does not meet the acceptance criteria. The Supplier shall investigate root cause, implement corrective actions and process control methods to ensure conformance. Mitigation plans shall be approved by P&W.
Interim B	Cpk < 1.00 Attribute: Yield < 90% Out-of-control conditions Insufficient sample size	

> ***Note 1**: Ppk may be used in place of Cpk when capability is being calculated for non-normal distributions.*

***Note 2**: Execution of this PPAP Element does not automatically grant any sampling authorization. For RTX Supplier sampling requirements, refer to ASQR-20.1.*

When an Organization reaches PPAP Interim A/Full Approval levels, process capability shall be maintained per Table 1 above through life of production. Organization shall monitor stability, control (i.e., use of SPC control chart) and process capability index (e.g., CpK/PpK). When the process is not meeting the required control and capability thresholds, the Organization shall assure the appropriate reaction plan if followed that is documented in the Control Plan and/or work instructions and take improvement actions to bring the process capability back to a minimum of Cpk/Ppk =1.33 for KPC/KC features and a minimum of Cpk/Ppk = 1.0 for Organization identified KC's, while under statistical control.