INTRODUCTION

This document defines Production Part Approval Process (PPAP) requirements for the following RTX business entities (i.e. Member organizations):

Business Unit	Short Name	Applicable PPAP Document
Collins Aerospace	Collins	SAE AS9145
Pratt & Whitney	PW	ASQR-01[1]
Pratt & Whitney Canada	P&WC	ASQR-01[1]

[1] – ASQR-01 references SAE AS13100 Chapter B for PPAP requirements

This document has been aligned to the APQP requirements of SAE AS 9145 (technically equivalent to the IAQG AS/EN/JISQ 9145) to implement APQP approach at P&W. The PPAP is a phase gate in APQP.

The purpose of the APQP is to provide a phased program management approach to ensure that new products satisfy customer requirements, as well as the project management requirements of project timing and delivery. To accomplish this, necessary steps need to take place at the appropriate times within the product realization process.

A successful APQP project will always start with a detailed plan based on key customer dates. A project management approach is used to implement the plan which continually reinforces identification and mitigation of risks, monitors status of tasks and deliverables, and escalates issues to management as necessary. This approach provides effective early warning signals to drive on-time and on-quality delivery of products.

APQP has five phases (see Figure 1) starting with conceptual product needs and extending throughout the product life cycle.

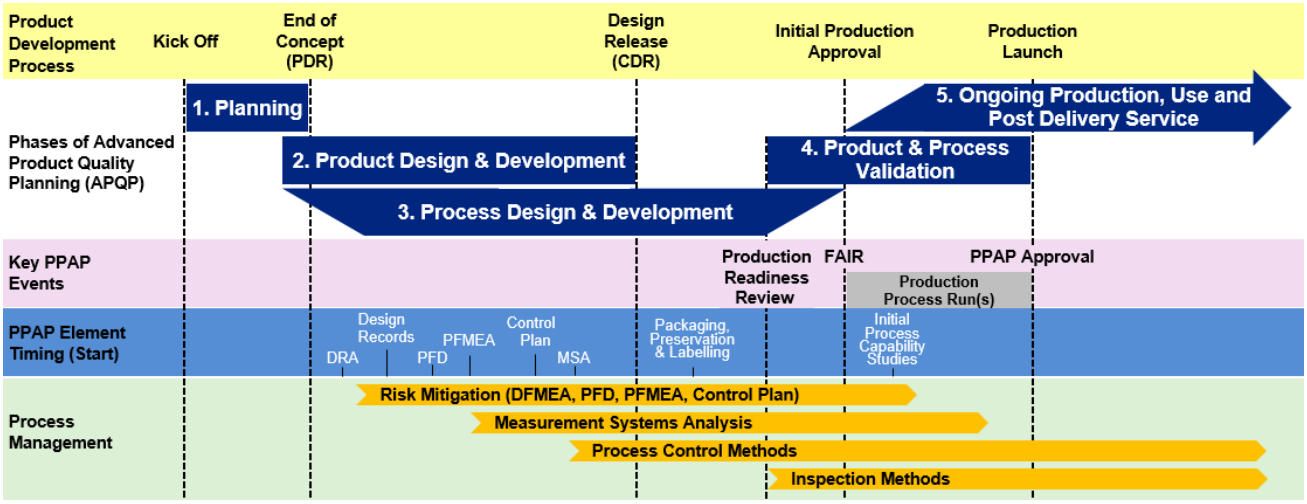

Figure 1: Product Development Process and Advanced Product Quality Planning (conceptual illustration)

PPAP Approval is Gate 4 of APQP and used to validate that the production process has demonstrated the potential to produce products that consistently fulfill all Member requirements while operating at the customer demand rate.

Reference SAE AS9145 and IAQG Supply Chain Management Handbook (SCMH) - Section 7.2 APQP)

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REVISION SUMMARY

This requirement document was revised align with changes made to SAE AS13100, as well as P&W specific requirements when managing Key Product Characteristics.

SCOPE

1.1 PPAP is required when invoked pursuant to a Purchase Order (PO) or any other contractual document issued by Member. PPAP may also be required as part of a Member quality initiative (e.g., Member Zero Defect Plan (ZDP)).

Note 1: Generally, PPAP is not required on industry standard parts or Commercial-Off-The-Shelf (COTS) parts.

Note 2: For further clarification of RTX PPAP requirements, the Producer *should* contact its Member procurement *representative who can refer it to the appropriate Member Focal Point (MFP).*

Note 3: If a conflict arises between ASQR-09.2 and Member-defined *specifications or procedures, the latter takes precedence.*

1.2 This requirement is applicable to all members of the supply chain (Reference 4.1.4).

2 NORMATIVE REFERENCES

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

Document	Title
SAE AS9102*	Aerospace First Article Inspection Requirement
SAE AS9145*	Aerospace Series - Requirements for Advanced Product Quality Planning and Production Part Approval Process
SAE AS13000	Problem Solving Requirements for Producers
SAE AS13100	Supplemental Quality Management System Requirements
SAE RM13004	Defect Prevention Quality Tools to Support APQP & PPAP
SAE RM13006	Process Control Methods
ASTM E2782	Standard Guide for Measurement Systems Analysis (MSA)
ASQR-01	Supplier Quality System Requirements
ASQR-20.1	Supplier Sampling Requirements
AIAG Manuals	Advanced Product Quality Planning (APQP) & Control Plan, Production Part Approval Process (PPAP), Failure Mode Effects & Analysis (FMEA), Measurement System Analysis (MSA), and Statistical Process Control (SPC)
PW-QA 6090	Gage Suitability Process
PWA 79345	Management & Classification of Key Product Characteristics
IAQG SCMH	IAQG Supply Chain Management Handbook

Table 1: Referenced Documents

* *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).*

2.2 Additional PPAP reference documents, such as Forms and the PPAP Assessment Checklist, can be found online at www.RTX.com/suppliers in the PPAP Toolbox. Contact your Member Focal Point (MFP) for more information.

3 TERMS & DEFINITIONS

3.1 **Critical Item (CI):** Those items (e.g., functions, parts, software, characteristics, processes) having significant effect on the product realization and use of the product; including safety, performance, form, fit, function, producibility, service life, etc.; that require specific actions to ensure they are adequately managed. Examples include safety CIs, fracture CIs, mission CIs, Key Characteristics (KCs), and maintenance tasks critical for safety.

3.2 **Design Records:** Comprised of the engineering definition / specification, that fully define the product (system, part, component, or assembly), including physical or electronic/digital drawings, electronic/digital models, software, or other associated information. This includes records of authorized engineering changes.

3.3 **Design Responsible Party:** Producer of products defined by a design/drawing proprietary to that Producer and linked to a Member part number using a Member-referenced drawing and/or other PO requirements (e.g., Category 1, Source Control, Source Design, Engineered Item).

3.4 **Feature:** Any characteristic, dimension, note, specification, or embedded requirement found on the drawing or drawing related documents.

3.5 **Input Data Sheet (IDS):** A summary completed by Member or Design Responsible Supplier Party to communicate Key Characteristics as defined by the output of the Design Risk Assessment.

3.6 **Industry Standard Parts:** Parts for which the design, manufacturing, inspection data, and marking requirements necessary to demonstrate conformity of the part are in the public domain and published or established as part of officially recognized standards (e.g., AN (Air Force-Navy Aeronautical Standard), AS (Aerospace Standard), MS (Military Standard), NAS (National Aerospace Standard)).

3.7 **Kappa:** A statistic that is a measure for assessing the reliability of agreement between a fixed number of assessors.

3.8 **Key Characteristic (KC):** An attribute or feature whose variation has a significant influence on product safety, fit, performance, service life, or producibility; that requires specific action for the purpose of controlling variation. KCs may be identified by Member and/or the Producer. This definition is further explained as follows:

- KCs for a part, subassembly, or system are those selected geometrical, material properties, functional and/or cosmetic features, which are measurable, whose variation control is necessary in meeting Member requirements and enhancing Member satisfaction.
- Process KCs are those selected measurable or attribute characteristics of a process whose control is essential to manage variation of part or system KCs.
- Substitute KCs may be identified when a Member-defined KC is not readily measurable within the production/maintenance setting and other characteristics may need to be controlled to ensure conformance.

Note: Member-defined KCs may be identified differently (KPC1, KPC2, etc.).

3.9 Member Focal Point (MFP): An individual assigned as the Member designated PPAP interface between the Producer and Member Quality who is responsible for supporting PPAP deployment and approving the PPAP Package.

3.10 Part Family: A group of similar parts used for similar applications that have similar features, material, and manufacturing process steps.

3.11 PPAP Element: A specific requirement governed by the PPAP process and requiring objective evidence of being met. Alternatively, the supporting evidence that a defined development requirement has been met.

3.12 PPAP File: A file or group of files (hardcopy or electronic) containing objective evidence in support of PPAP requirements that is compiled and maintained by the Producer.

3.13 PPAP Package: A submission by the Producer to the MFP that contains any required forms and objective evidence to demonstrate that the PPAP Elements corresponding to the required Submission Level SL have been satisfied.

3.14 PPAP Project Plan: Documentation of the scope, activities, and deliverables required to achieve PPAP Full Approval, including key customer-driven dates and identification of persons responsible for deliverables.

3.15 Process Capability: The ability of a process or product to consistently meet a specification or Member requirement often expressed as a statistical capability index such as Process Capability (Cpk) or Process Performance (Ppk).

3.16 Process Family: A group of manufacturing processes used to produce similar features using similar machines, tools, fixtures, set-ups, and programs.

3.17 Process Stability: A condition or state of behavior of a process where, through the use of past experience, near-term future behavior can be predicted reliably within limits. A condition where there is no indication of a special cause of variation, but where only random common cause variation is present.

3.18 Producer (Internal or External Supplier): The entity or party that supplies product or services to a customer in accordance with contract requirements

3.19 Production Readiness Review (PRR): A review of the manufacturing process (e.g., equipment, operator training, manufacturing documentation, Control Plan, associated measurement tools) by a multi-disciplinary team to verify that the production processes are appropriately defined, documented, and ready for production.

3.20 Provider (Sub-tier): Any entity issuing or processing parts as a service to the contracted Producer (Supplier).

3.21 Submission Level (SL): A categorization, based on applicable PPAP Elements, that defines the required documentation to be provided to the MFP or their Authorized Delegate for review.

3.22 Acronyms: The following defined acronyms are used within this document

Acronym	Definition
APQP	Advanced Product Quality Planning
ASAP	Approved Supplier Alternate Procedure
CI	Critical Item
Cpk	Process Capability Index
CSI	Critical Safety Item
DFMEA	Design Failure Mode and Effects Analysis
DRA	Design Risk Analysis
EC	Engineering Change
eSRI	Electronic Supplier Request for Information
FAIR	First Article Inspection Report
FSC	Flight Safety Characteristic
IAQG	International Aerospace Quality Group
IDS	Input Data Sheet
KC	Key Characteristic
KPC	Key Product Characteristic
MCL	Materials Control Laboratory
MFP	Member Focal Point
MSA	Measurement Systems Analysis
NDA	Non-Disclosure Agreement
NDT	Non-Destructive Testing
P/T	Precision-to-Tolerance Ratio
PFD	Process Flow Diagram
PFMEA	Process Failure Mode and Effects Analysis
PO	Purchase Order or Production Order
PPAP	Production Part Approval Process
PRR	Production Readiness Review
QN	Quality Notification
SL	Submission Level
SME	Subject Matter Expert
SPC	Statistical Process Control
TKC	Temporary Key Characteristic

4 PPAP REQUIREMENTS

4.1 General Requirements

4.1.1 The Producer shall submit all PPAP planning & objective evidence utilizing Member Online PPAP Software Application. In the event the software is not available, the Producer shall contact the MFP for submission requirements.

4.1.2 Upon notification of a PPAP requirement (i.e., for P&W internal Producers, via QAD with PW-QA 6100 called out), the Producer shall submit a PPAP Project Plan on ASQR-09.2 Form 1 or electronic equivalent to the MFP with the commitment dates to complete each PPAP Element (i.e. the "PPAP Project Plan") within 15 business days containing the commitment dates to complete each PPAP Element. If business conditions cannot support submission of a PPAP Project Plan within the 15 business days interval, the Producer shall work with the MFP to establish an alternate submission date.

Note: The PPAP Project Plan should show development of the PPAP Elements as early as possible in the part design and manufacturing process development phases as illustrated in the Introduction (e.g., DRA, PFD, PFMEA, Control Plan).

4.1.3 There are 11 PPAP Elements described in Section 5. The Producer shall satisfy the requirements of all PPAP Elements unless a PPAP Element is not applicable to the part or to the activities performed by the Producer (e.g., Element 2 - Design Risk Analysis would only be applicable to a Design Responsible Party). PPAP Elements that the Producer proposes as "not applicable" require approval by the MFP.

4.1.4 The Producer shall flow down the requirements of PPAP to all levels of its supply chain (internal & external) and maintain records of their compliance. A risk-based decision process may be used to assess PPAP applicability for sub-level components or operations processes when approved by Member (Reference 5.11). The Producer's deployment to all levels of its supply chain shall include obtaining records of such deployment and ensuring all KCs are properly identified in the PPAP package as objective evidence of PPAP execution.

4.1.5 The Producer shall collect supporting data to demonstrate that it has met the requirements of each PPAP Element and include it in the PPAP File as the data is produced. Supporting data shall be representative of the production process (e.g., tools, machines, instructions, methods, and operators, etc.). Data from non-production tooling or processes must be identified and documented within the PPAP Element(s) and may only be used in the PPAP File when approved by the MFP and must be identified as "non-production" and documented within the PPAP Element(s).

4.1.5.1 The Producer shall submit the required evidence for each applicable PPAP Element as it is completed.

Note: MFP will review and disposition individual PPAP Elements. The PPAP Package disposition is initiated upon PPAP Element 11 (PPAP Approval) submission.

4.1.6 The Producer is permitted to submit a PPAP Package that includes partially completed PPAP Elements (per Disposition section for review). PPAP 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.

4.1.7 The Producer shall obtain authorization via the Member Online PPAP Software Application or PPAP Approval Form (ASQR-09.2 Form 1) or electronic equivalent for Full or Interim Approval from the MFP before production parts are shipped.

4.1.8 The Producer shall submit all required evidence for PPAP Elements previously identified as incomplete in order to obtain a formal Full Approval disposition from the MFP (reference Disposition section).

4.1.9 The Producer shall review applicable PPAP Elements as part of any corrective action (e.g., QNs, escapes, Member/Certification Body/Regulatory audit findings, negative trending of Cost of Poor Quality, etc.) to determine the impact and shall update affected PPAP Elements where appropriate as per PPAP Change (Delta) section.

4.2 PPAP Submission and Disposition

4.2.1 Submission Levels

4.2.1.1 The Producer Submission Level shall be established by the MFP based on risk assessment, where Level 1 is the lowest level of risk and Level 5 is the highest.

4.2.1.2 The default submission is Level 3 unless otherwise specified by the MFP.

4.2.1.3 The Producer shall complete and maintain documentation for all applicable PPAP Elements in its PPAP File as follows:

Submission	Required Documentation
Level 1	Element 11 only
Level 2	Element 11 and any additional MFP requested evidence
Level 3	Element 11 with complete supporting data submitted for all Elements per 4.2.3
Level 4	Element 11 with consultation with the MFP for all Elements per 4.2.3
Level 5	Element 11 with complete supporting data submitted for all Elements per 4.2.3, reviewed by Member at the Producer's manufacturing location

Table 2: Submission Levels

4.2.2 Disposition

4.2.2.1 The Producer shall receive a copy of the PPAP Approval Form (ASQR-09.2 Form 1) or electronic equivalent from Member Online PPAP Software Application or the MFP with the following possible PPAP dispositions:

a. Full Approval
b. Interim Approval (includes former A and B approval levels)
c. Deferral
d. Rejected (not authorized to ship)

4.2.2.2 Interim Approval indicates a gap between the PPAP requirements and the Producer's current status on one or more of the following PPAP Elements:

PPAP Element	Title
2	DRA
4	PFMEA
6	MSA
7	Initial Process Capability Studies
9	FAIR
10.2	Production Process Run(s)

Refer to Section 5 for further detail on Interim Approval requirements for Elements 7 and 10.2.

4.2.2.3 Interim Approval expires with the plan date for Element 11 (PPAP Approval). A new submission on ASQR-09.2 Form 1 or electronic equivalent and then dispositioned by the MFP (i.e., Interim or Full Approval) is required to continue shipment of production parts.

4.2.2.4 In very limited circumstances, an authorization for deferral may be requested via Member Online PPAP Software Application or using the PPAP Deferral Form (ASQR-09.2 Form 2) or electronic equivalent and Element 9 (FAIR) to authorize the shipment of production parts prior to achieving Full or Interim Approval.

Note: The Producer should initiate a deferral request at the time that it is identified the planned timing cannot be met.

4.2.3 PPAP Documentation

4.2.3.1 The PPAP File shall:

a) Be part number specific. The following PPAP Elements may be satisfied using a part or process family methodology with all unique characteristics accounted for with approval from the Member:

PPAP Element	Title
2	DRA
3	PFD
4	PFMEA
5	Control Plan
6	MSA
8	Packaging, Preservation, and Labeling Approval
10.2	Production Process Run(s)

b) Be maintained by the Producer at the manufacturing location

c) Be maintained with all applicable items up-to-date and represent the current production process regardless of whether Member requests a formal submission

d) Contain copies of all PPAP approvals

e) Contain objective evidence in support of PPAP Element requirements

f) Be retained for the period required by ASQR-01

4.2.4 PPAP Change (Delta)

4.2.4.1 Resubmission of applicable PPAP File(s) is required when a previously approved (i.e., Interim or Full approval) product or process undergoes a change **or** for a correction of a discrepancy on a previous submission. A change is defined as following:

a) A change in design characteristics affecting fit, form, or function of the part

b) A change in manufacturing characteristic(s) as follows:

- Manufacturing source(s)
- process(es)
- inspection method(s)
- locations of manufacture
- tooling
- materials that can potentially affect fit, form, or function

c) Numerical control program change or its translation to another media that can potentially affect fit, form, or function

d) A natural or man-made event, which may adversely affect a manufacturing process

e) A lapse in production for two years

4.2.4.2 When a resubmission is required due to a product or process change, the Producer will notify the MFP and review the scope of potential update(s) for all affected PPAP Elements (e.g., Process Flow Diagram, PFMEA, Control Plan, etc.). Specific focus should be placed on process controls, tooling, new potential failure modes, and new failure mode causes.

4.2.4.3 MFP disposition of Element 11 (PPAP Approval) shall be obtained prior to shipping production parts after the implementation of any such changes.

5 ELEMENT REQUIREMENTS

5.1 Element 1 – Design Records

5.1.1 The Producer shall document all Design Records (e.g., Member / Producer drawings, models, specifications, IDS, Bill of Materials) including the PO with quoted demand rate in the PPAP File.

5.1.2 The Producer shall document that the product has been manufactured to a production released design record aligned with the PO.

5.2 Element 2 – Design Risk Analysis (DRA)

5.2.1 The Design Responsible Party shall perform and document a design risk analysis related to performance (i.e., fit, form, and function), durability, service life, reliability, manufacturability, maintainability, and cost. Appropriate design risk mitigation activities are identified, prioritized, and completed.

5.2.2 A Design Failure Mode and Effects Analysis (DFMEA) per SAE AS13100/SAE ITC RM13004 shall be used. Alternate methods that achieve the same objectives as a DFMEA may be used with prior approval by the Member.

Note: A safety or criticality analysis that may fulfill regulatory requirements does not address the full scope of a design risk analysis and cannot be considered as an equivalent method.

5.2.3 All KCs and CIs identified through the risk analysis shall be documented in Element 1 (Design Records) using the Input Data Sheet (SCMH 7.2.16 KC Traceability Form) or equivalent.

Note:The MFP may grant Interim Approval if open actions and mitigation plans exist at the time of submittal (Reference 4.2.2).

5.3 Element 3 – Process Flow Diagram (PFD)

5.3.1 The Producer shall create and document a PFD as per SAE ITC RM13004 that includes all operations in sequential order from receipt of materials through storage and shipment of the finished product. Alternative formats for a PFD require approval by Member and at a minimum shall include:

- Alternate processes, standard rework loops, and movement of product to and from external operations
- Key inputs and outputs of each process step including identification of all KCs that impact product or process
- Flow direction and a legend to define flowchart symbols or equivalent color coding

Note: The Producer should consider the maximum expected volume as communicated by Member in defining the PFD

5.4 Element 4 – Process Failure Mode and Effects Analysis (PFMEA)

5.4.1 The Producer shall perform and document a risk analysis of the manufacturing process to identify mitigation plans for high risks using the PFMEA methodology per SAE ITC RM13004. Appropriate process risk mitigation activities are identified, prioritized, and completed. Alternate methods that achieve the same objectives as a PFMEA may be used with prior approval by Member and at a minimum shall include:

- Process Flow Diagram alignment (including all process steps)
- All product KCs (including customer defined KCs)
- Consideration of product family quality history including but not limited to, non-conformances, escapes, and lessons learned
- Identification of process KCs (as defined by risk) to be included in the Control Plan

5.4.2 The Producer may define alternate Severity, Occurrence, and Detection ranking criteria when SAE ITC RM13004 tables do not suit the process being analyzed. Use of Producer-defined criteria requires prior approval by Member.

Note: The MFP may grant Interim Approval if open actions and mitigation plans exist at the time of submittal (Reference 4.2.2).

5.5 Element 5 – Control Plan

5.5.1 The Producer shall document any manufacturing risks are adequately controlled by developing a Control Plan as per SAE ITC RM13004. The Control Plan shall be used to ensure sustained process control throughout the manufacturing life of the part and/or assembly. Alternate methods and/or formats for a Control Plan require approval by Member and at a minimum shall include:

- Alignment to the PFMEA
- All product KCs and CIs defined by Member and/or the Producer as well as where they are created or modified within the process
- Process KCs and CIs defined by the Producer and/or Member as well as where they are created or modified within the process
- Any other design and process characteristics to be monitored during the manufacturing process, along with any required control methods (Reference SAE ITC RM13006)
- Specifications/tolerances for all product and process KCs
- The measurement system used
- The sample size and frequency
- The control method used to ensure that manufacturing and assembly processes behave in a consistent and predictable manner. Control methods are typically one of the nine methods in accordance with SAE ITC RM13006. Control methods detect anomalies when they occur and signal the need to invoke a reaction plan
- The Reaction Plan to be invoked when the control method signals the need to take corrective action to restore desired process behavior

5.6 Element 6 – Measurement System Analysis (MSA)

5.6.1 MSA shall, at a minimum, be performed and documented on the measurement methods for KCs (product and process) identified in the Control Plan as per SAE AS13100 7.1.5.1.2 Table 4. For additional guidance, reference ASTM E2782. Ensure the requirements of PW-QA 6090 Gage Suitability are met for military KPC1 features per PWA 79345.

5.6.2 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 Member.

5.6.3 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

5.6.4 When deficiencies are identified with meeting the requirements of SAE AS13100 paragraph 7.1.5.1.2 Table 4 (e.g., P/T ratio, bias, stability, linearity, repeatability, discrimination), the Producer shall document a mitigation plan that ensures conformity of product.

Note: The MFP may grant Interim Approval if open actions and mitigation plans exist at the time of submittal (Reference 4.2.2).

5.7 Element 7 – Initial Process Capability Studies

5.7.1 Initial process capability studies using industry recognized statistical methods shall be performed and documented for product and process KCs identified within the design records and supporting Control Plan.

Note: Capability studies should take into consideration the effects of people, machines, tooling, methods, materials, measurements, and environmental conditions.

5.7.2 The Producer shall collect a minimum quantity of 25 consecutive samples utilizing variable data where feasible.

Note 1: Data collected from development or pre-production parts can be considered, provided the same tooling, equipment, and processes intended for production are used.

Note 2: Use of short run SPC techniques (e.g., target, group, part family charts) may be permitted, with MFP agreement of the approach and source of data.

5.7.3 Process capability indices (e.g., Cpk, Ppk based on distribution) should be calculated only after both of the following conditions are met:

5.7.3.1 Requirements of Element 6 (MSA) have been met,

5.7.3.2 The process is determined to be stable, using statistically valid methods (e.g., Control Charts) for determining process capability, and stability. Measures of process capability other than Cpk (e.g., Ppk based on distribution, etc.) may be used only if such measures have received documented approval by the MFP. Refer SAE ITC RM13006 for bilateral tolerance and unilateral tolerance capability indices, as well as analysis of normal versus non-normal data.

Note: Ppk may be used in place of Cpk when capability is being calculated for non-normal distributions. As a Best Practice, it is also recommended, after gathering data over a long-term (i.e., 100-200 data points, two or more lots of production that reflect multiple batches of material, and multiple set-ups), to calculate Ppk and compare to Cpk. The more similar Ppk is to Cpk reflects a stable process. Both being greater than or equal to 1.33 reflects good Cpk (reference SAE ITC RM13006).

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

Approval Level	Results	Interpretation
Full	• **For IDS KC:** Variable Process Capability Index ≥ 1.33 • **For Process KC:** Variable Process Capability Index ≥ 1.00 • **Attribute:** 45 in a row without any nonconformances	The process satisfies the acceptance criteria. The Producer shall determine acceptability of Producer defined process KCs based on internal requirements
Interim	• Variable Process Capability Index < 1.33 • **Attribute:** Yield < 90% • Out-of-control conditions • Insufficient sample size	The process does **not** meet the acceptance criteria. The Producer shall investigate root cause and implement corrective actions and process control methods to ensure conformance. Mitigation plans shall be approved by Member. The MFP is available to review the Process Capability Study results and propose necessary improvements to the process and Control Plan.

Table 3: Process Capability Acceptance

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

5.7.5 Where there are current technology limitations or it is prohibitively expensive to satisfy the stability, capability, and/or production yield requirements of this section, the Producer shall submit a request for exception via the Online PPAP Software Application. Member-specific form may be used in the event the online system is not available.

5.8 Element 8 – Packaging, Preservation, and Labeling Approvals

5.8.1 The Producer shall obtain Member approval that the methods of packaging, preservation, and labelling of production materials and product conform to Member-defined specifications.

Note 1: The Producer should verify that the planned packaging ensures that the product or material will not be damaged, nor will the packaging degrade in performance through the normal course of transportation, delivery, and storage.

Note 2: The packaging materials should satisfy standards for environmental safety and pose no hazards to operators who are in contact with them. Consideration should be given to both primary and secondary packaging, as well as use and recycling of packaging materials.

5.9 Element 9 – First Article Inspection Report (FAIR)

5.9.1 The Producer shall perform and document a FAIR in accordance with ASQR-01.

*Note: In the event that the FAI has been completed with an unresolved nonconformance, the MFP is permitted to grant Interim Approval when **both** of the following requirements are met:*

- *As applicable, the signed Form 8097 has been marked as "Not Complete" or the signed AS9102 Form 1 or electronic equivalent contains a nonconformance,*
- *The Producer has an action plan in place (Reference 4.2.2).*

5.10 Element 10 – RTX PPAP Requirements

5.10.1 Element 10.1 – Part Marking Approval

5.10.1.1 The Producer shall document all part marking requirements are met by obtaining approval from Member.

Part marking objective evidence submitted with the FAI Report under Element 9 shall satisfy Element 10.1.

5.10.2 Element 10.2 – Production Process Run(s)

5.10.2.1 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 Member request, the Producer shall record and submit the results of the review, including corrective action to resolve any identified risks or issues.

5.10.2.2 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 Member requirements.

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

5.10.2.4 Subsequent to the complete FAIR, the completed Production Process Run(s) shall be evaluated per the following acceptance criteria:

Approval Level	Acceptance Criteria	Interpretation
Full	• Minimum 25 consecutive parts with no QNs and no active Minor Deviations. • Second dimensional report (applicable sections of AS9102 Form 3 or equivalent form may be used) produced from or after the 25th part.	The process satisfies the acceptance criteria.
Interim	• FAIR with data from any additional parts available at time of submission.	The process does **not** meet the acceptance criteria for Full approval. The Producer shall implement corrective action as necessary and continue data collection.

Table 4: Production Readiness Acceptance

5.10.2.5 Where there are current technology limitations or it is prohibitively expensive to satisfy the requirements of this section, the Producer shall submit a request for ***exception*** via the Online PPAP Software Application. Member-specific form may be used in the event the online system is not available.

5.11 Element 11 – PPAP Approval

5.11.1 Upon a satisfactory internal review, the Producer shall submit Element 11 to the MFP for approval including submission of all approved PPAP Approval Forms (ASQR-09.2 Form 1) or electronic equivalent from all levels of the Producer's supply chain.

5.11.2 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.

5.11.3 Sign-off shall be completed by the MFP per Disposition section.

6 FORMS

The following records are referenced within this document:

Record	Title
ASQR-09.2 Form 1	PPAP Approval
ASQR-09.2 Form 2	PPAP Deferral
SCMH 7.2.16 KC Traceability	Input Data Sheet (IDS)

Table 5: PPAP Forms