



APQP & PPAP WEBINAR

APQP & PPAP within the Aerospace Supply Chain. Hosted by the AESQ Subject Matter Interest Group

AESQ – Aerospace Engine Supplier Quality Strategy Group

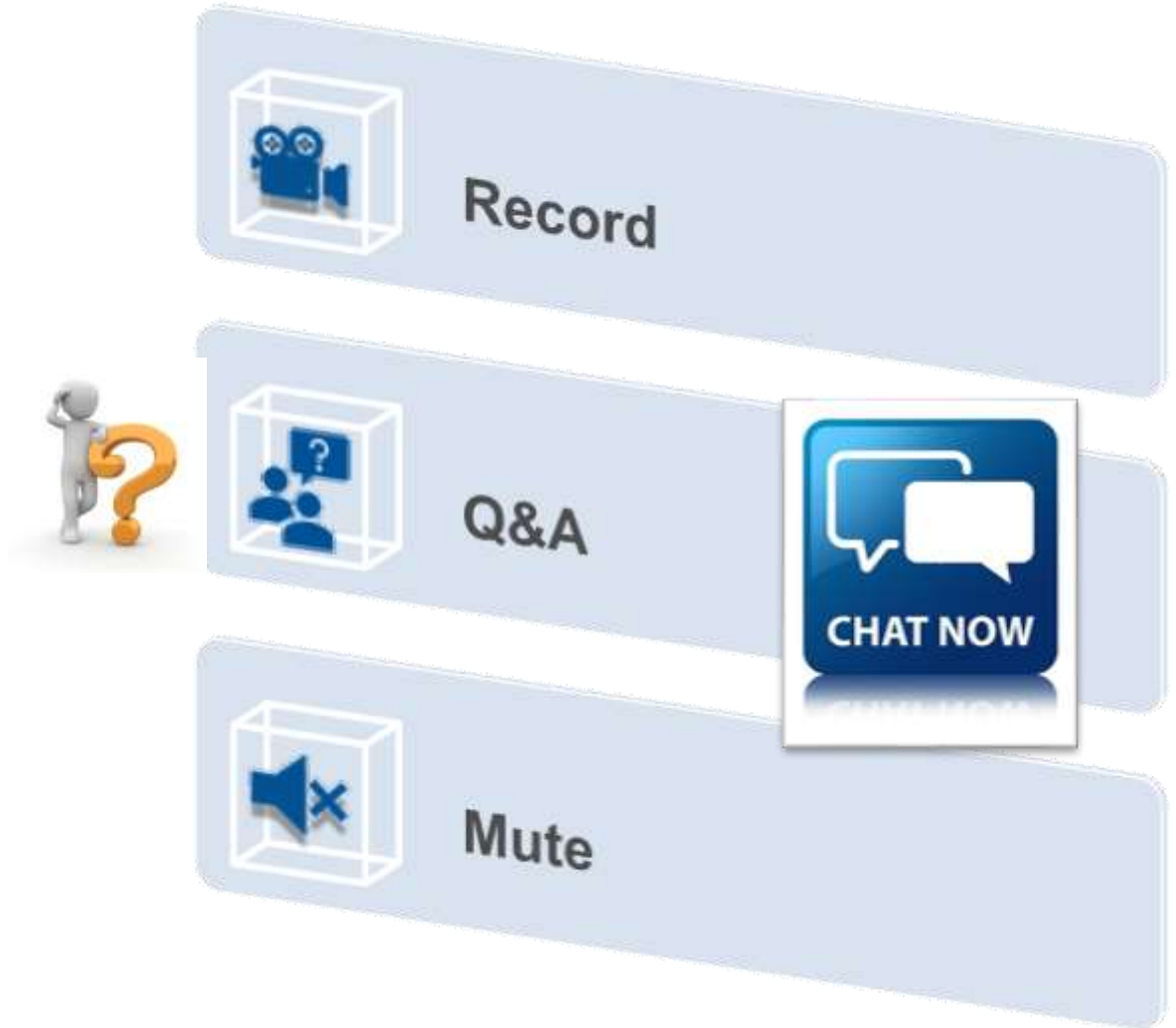
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Webinar Overview

We are **recording** today's webinar and will distribute the video link following the close of the webinar. It will also be posted on the AESQ website for free viewing.

We will take **questions** during today's webinar using the **Chat** feature.

Please remain on Mute during the presentation to prevent background noise. We will also be muting all lines at the start of the session.



Webinar Overview

Section	Timing	Lead
• Introduction	5 mins	Russell Palmiter [Pratt & Witney]
• AS13100 APQP & PPAP v AS9145	15 mins	Kenneth Hatcher [Raytheon Technologies]
• When does APQP and PPAP apply?	10 mins	Daniel McCarty [PCC Structural]
• PPAP File and Submission	20 mins	Michael Fuehner [GE Aviation]
• Demystifying use of APQP and the link with PPAP	45 mins	Karl Evans [Rolls-Royce]
• Demystifying ongoing change management	15 mins	Robert Latour/ Russell Palmiter [Pratt & Witney]
• Close – Q&A	10 mins	Magnus Holm /Ake Winkvist [GKN]

How to Contribute

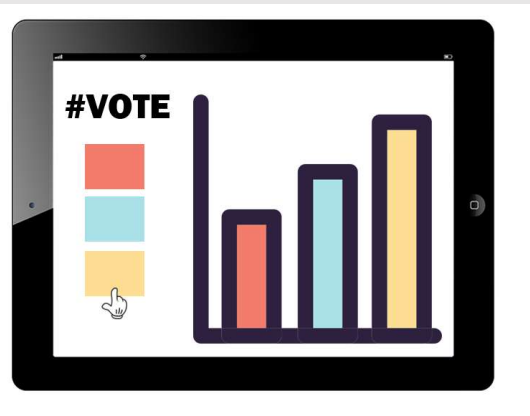


Magnus Holm
Supplier Quality Systems Lead
GKN Aerospace



Åke Winkvist
Manufacturing Engineer - Industrial
GKN Aerospace

Use the **Chat Function** to ask a question at any time,
or to make a comment.



Becky Lemon
Industry Program Manager
SAE ITC

Please answer the **Survey Questions** when asked (they are anonymous).

a) Have you read AS13100?

- I. Yes
- II. No

(b) Are you using RM13145 as a guide for APQP and PPAP?

- I. Yes
- II. No

(c) How would you judge your knowledge of APQP?

- I. No Knowledge
- II. I know of it but no experience of using it
- III. I have used it a few times
- IV. I consider myself to be an expert

(d) How would you judge your knowledge of PPAP?

- I. No Knowledge
- II. I know of it but no experience of using it
- III. I have used it a few times
- IV. I consider myself to be an expert

AS13100 SECTIONS AND APQP/PPAP V AS9145

KENNETH HATCHER
RAYTHEON TECHNOLOGIES



RTX Quality Transformation Lead
and SAP S4HANA transition
Quality Lead. Served 20 plus
years in the Quality Assurance
Community. Roles included
Hardware, Software, and
Supplier Quality

Introduction

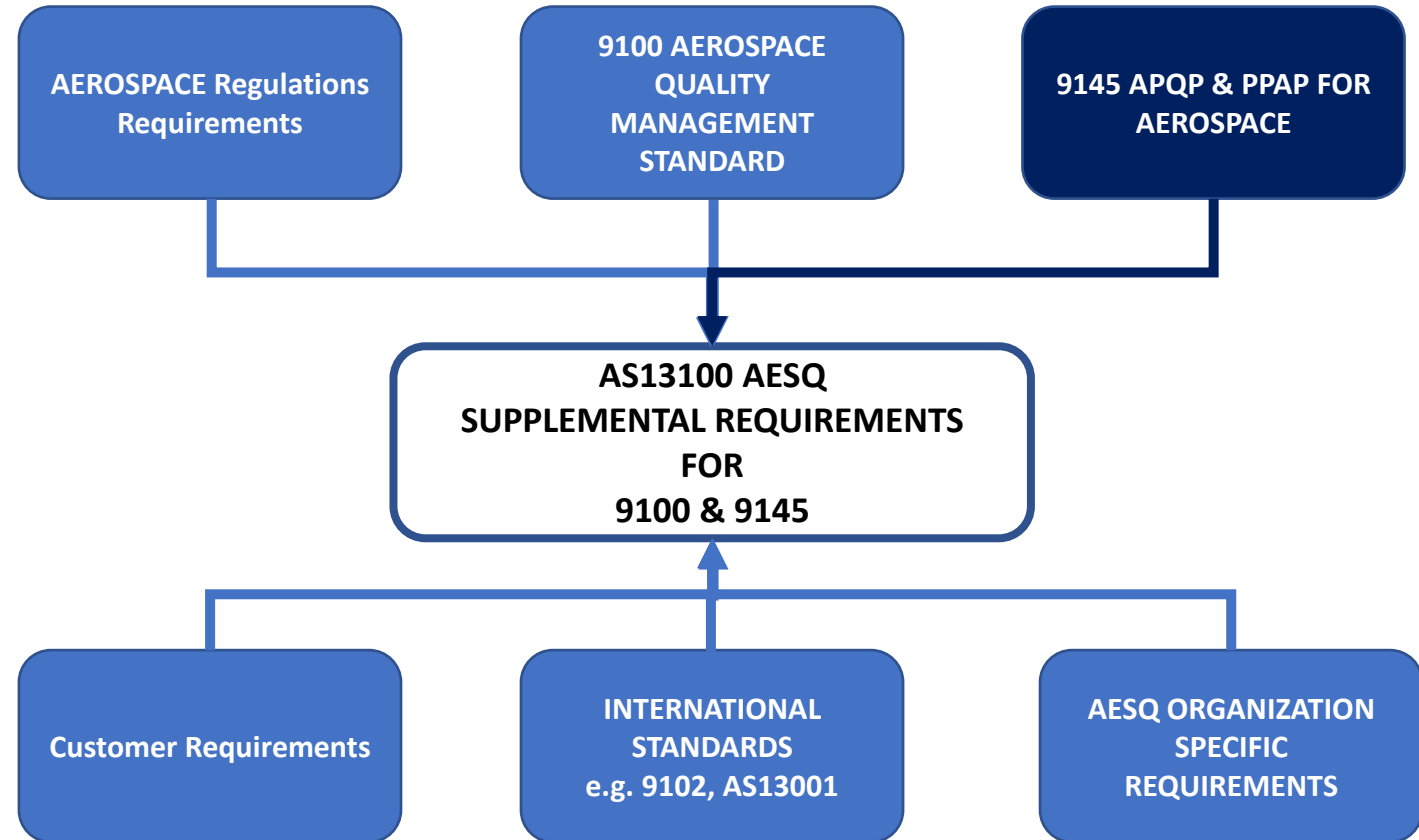


- This portion of the presentation covers the **harmonization efforts and tailoring requirements** in AS13100 relative to ISO9000, 9100, 9145
- The purpose of this presentation is only to do a high-level review of these harmonization efforts and highlight the differences between AS9145 & AS13100 Chapter B
- *NOTE: APQP-PPAP is a requirement in AS13100, not a requirement in AS9100*

AS13100 Foundation

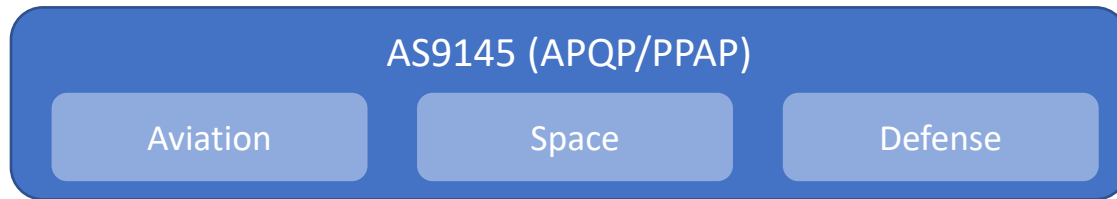


- Aerospace Engine Supplier Quality (AESQ) wanted to simplify the Quality Management System (QMS) requirements to the Aero Engine Manufacturers and Supply Base
- AS13100 was created harmonize ISO 9001, 9100, and 9145 and customer specific requirements for aero engine manufacturing

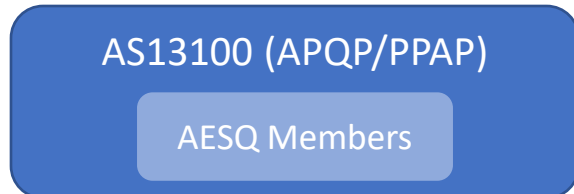


AS9145 and AS13100 Comparison

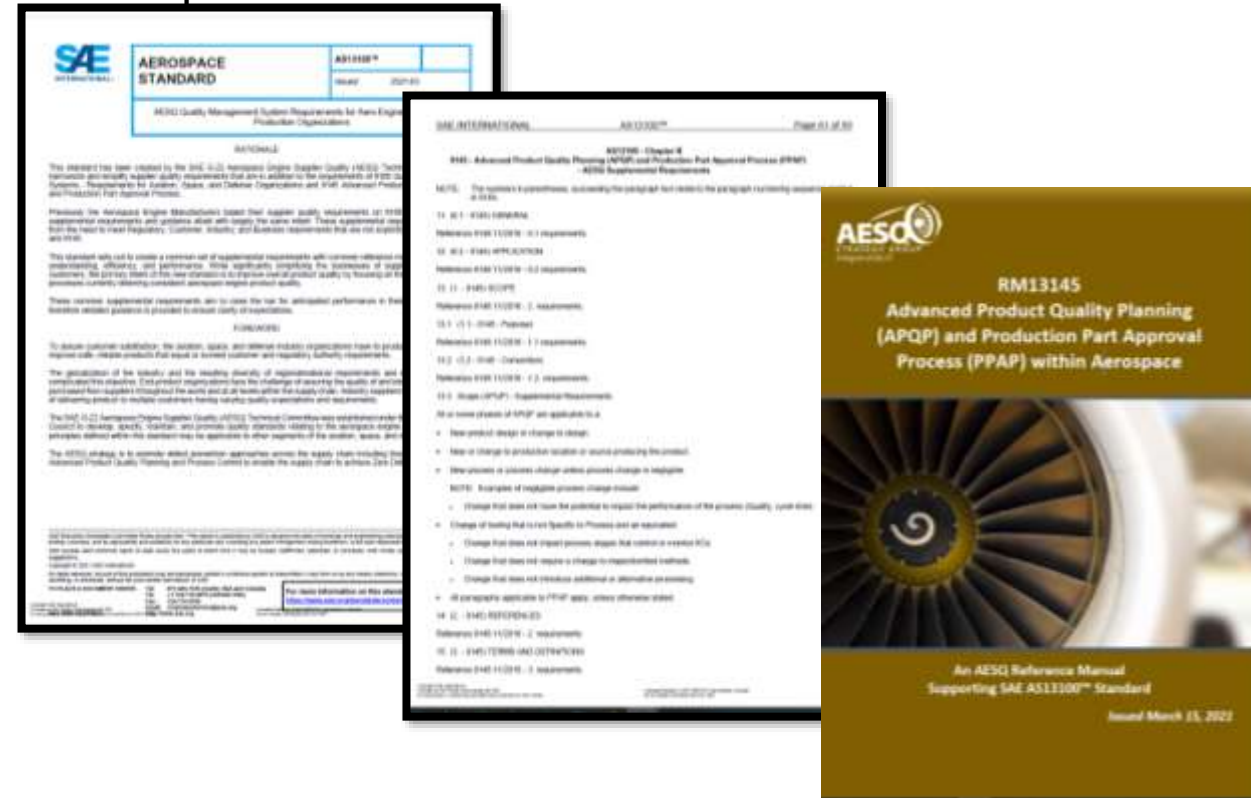
AS9145 defines the aviation, space, and defense APQP and PPAP requirements



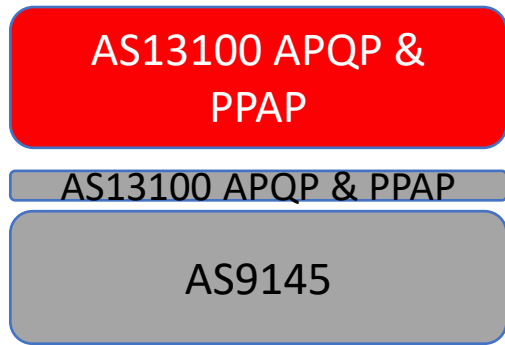
AS13100 complements AS9145 APQP and PPAP with tailored requirements and practices for the AESQ supply chain



AS13100 Chapter B and supporting Reference Manuals provide the details to these tailored requirements



How does AS13100 APQP & PPAP complement AS9145



AS13100 /
RM13145
APQP & PPAP

Good practices

V

Requirements



- Introduced Process Flow (customer & supplier).
- Improved clarity of AS9145 content.
- Linked RM1300X's as appropriate.
- Improved APQP Management – Enabled activities to be configurable and saleable based on change situations. Use of Events, planning deliverables and Elements to simply expectation during change management.
- Improved PPAP Management – Use of Submission Levels, clarification of Quality & Rate Data collection and enabled great customer standardisation.
- Providing robust methods & practices to operate APQP and PPAP through RM13145 (APQP & PPAP).

WHEN DOES APQP AND PPAP APPLY

DANIEL MCCARTY
PCC STRUCTURALS

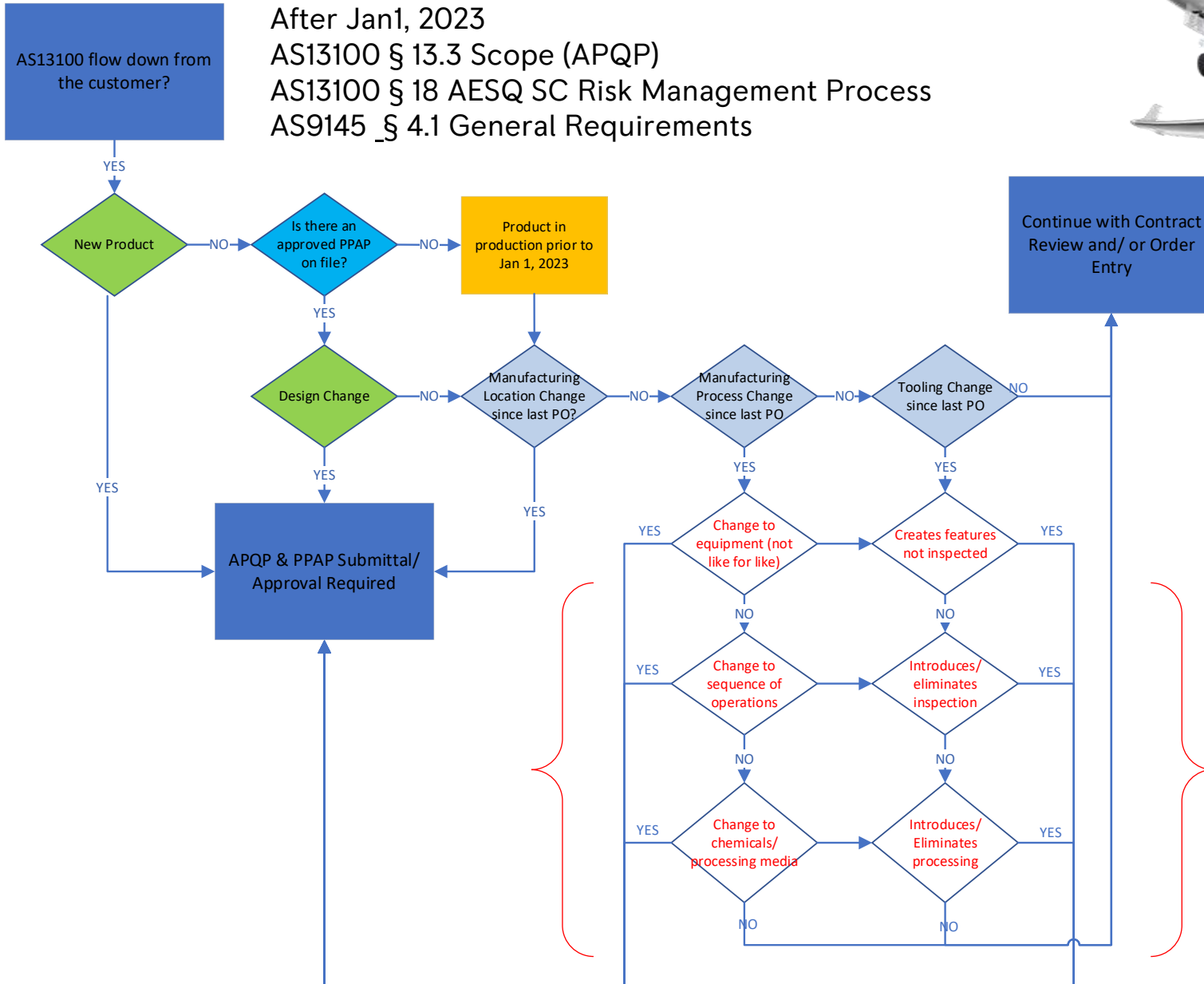


Head of Quality for Precision Castparts Corporation Fasteners and Engineered Products Divisions. AESQ committee deputy voting member representing PCC Structurals, Inc since 2019.

Applicability of APQP and PPAP



After Jan1, 2023
 AS13100 § 13.3 Scope (APQP)
 AS13100 § 18 AESQ SC Risk Management Process
 AS9145 § 4.1 General Requirements



Reference RM13145 § 5.1

1. New Product Design,
2. Product Design Modification,
3. Transfer from one facility to another (no product mod.),
4. New Process (no Product mod or new product design),
5. Processing changes (no Product mod),
6. Specific to Process Tooling replace/refurb
7. Negligible Process Change.

Scope of APQP and PPAP

So you have a ...

- New Product Designs
- New or Changes to Manufacturing Methods
- Manufacturing Transfers

Where do I go...

- RM13145 Table 10 (pg 35)
- Customer quality representative



Table 10: Application Matrix for APQP and PPAP Elements

APQP and PPAP Elements	Change Situations (as guidance, move left to right until relevant) Green refers to Non-Product Changes						
	New Product Design	Product Design Modification	Transfer from one facility to another (no product mod.)	New Process (no Product mod or new product design)	Processing changes (no Product mod)	Specific to Process Tooling replace/refurb	Negligible Process Change
DESIGN RECORD and BOM *	X [1]	X [1]					
DESIGN RISK ANALYSIS (DFMEA)	X [1]	X [1]					
DESIGN FOR MANUFACTURE	X [1]	X [1]					
PRODUCT CI and KC *	X [1]	X [1]					
PACKAGING SPECIFICATION	X [1]	X [1]					
DESIGN VERIFICATION/VALIDATION RESULTS	X [1]	X [1]					
PRELIMINARY SOURCING PLAN RISK ANALYSIS	X	X [4]	X	X [4]	X [4]		
PROCESS FLOW DIAGRAM	X	X	X	X	X		
FLOOR PLAN LAYOUT	X	X	X	X	X		
PACKAGING, LABELLING, ETC	X	X	X	X	X		
TEST INSPECTION PLAN (Char. Matrix)	X	X	X	X	X		
PFMEA	X	X	X	X	X		
PROCESS KEY CHARACTERISTICS	X	X	X	X	X		
CONTROL PLAN (Pre-Launch / Production)	X	X	X	X	X		
PRELIMINARY CAPACITY ASSESSMENT	X	X	X	X	X		
WORK STATION DOCUMENTATION	X	X	X	X	X		
SUPPLY CHAIN RISK MANAGEMENT PLAN	X	X [4]	X	X [4]	X [4]		
MSA PLAN	X	X	X	X	X	X	
PRODUCTION PROCESS RUN(S)	X	X	X	X	X	X	
MSA STUDIES	X [2]	X [2]	X [2]	X [2]	X [2]	X [2]	
INITIAL PROCESS CAPABILITY STUDIES	X [P]	X [P]	X [P]	X [P]	X [P]	X [P]	
DIMENSIONAL and NON-DIMENSIONAL RESULTS	X	X	X	X	X	X	
PRODUCT VALIDATION RESULTS	X [P]	X [P]	X [P]	X [P]	X [P]	X [P]	
INITIAL MANUFACTURING PERFORMANCE STUDIES	X	X	X	X	X		
CUSTOMER SPECIFIC REQUIREMENTS (PPAP)	X	X	X	X	X	X	
FIRST ARTICLE INSPECTION	X	X [3]	X [3]	X [3]	X [3]	X [3]	X [3]
PPAP SUBMISSION (Inc. Approval Form)	X	X	X	X	X	X	

Key:

* When no new product design or modification is taking place (green zone). These are represented by the established Design Record. Product Specifications and BoM.

X - Mandatory if Customer and/or Regulator and/or AS13100 require this, otherwise recommended. Either:

- Create new.
- Update the existing
- Develop in part aligned to what has changed.

X [NOTE] – as above X and consider these Notes:

[P] - apply in accordance to product specific requirements related to the Design Record and associated specification (E.g.: KC's)

[1] - for design responsible organizations only

[2] - When specified by the related MSA Plan (Phase 3 of APQP)

[3] - RM13102, consideration to LAI maybe likely

[4] - when supply chain has the potential to be impacted

PPAP FILE AND SUBMISSION

Michael Fuehner

Lead Supplier Quality Engineer
GE Aviation



Along with my role in Supplier Quality, I have worked on several project teams implementing APQP within GE Aviation's Quality Management System. The scope of these teams has focused on integrating APQP within the Source Change process, as well as the phases of New Product Introduction. I also work on a team whose goal is to communicate and clarify the resources and requirements of APQP to both the Supply Base and within GE Aviation. I have held previous roles in Quality and Production at the manufacturing level, where part of my responsibility was to execute and support APQP efforts, including PPAP.

Definitions



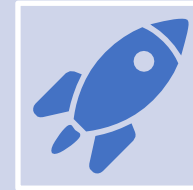
PPAP File – A living file containing objective evidence in support of PPAP requirements.



PPAP Submission – The package provided to the customer for approval, containing elements of the PPAP File as defined by the Submission Level.



PPAP Approval Form – A form included with all PPAP Submissions verifying the PPAP content and status.



Pre-Launch Control Plan – Plan that includes additional process controls to those intended for ongoing production (e.g., items from Design of Experiment studies). Reference RM13004.

PPAP File



Includes all elements, regardless of submission level.



Real-time information



Many formats



Source of data for PPAP Submission

Ref	Element title
1	Design Record
2	Design Failure Mode and Effects Analysis (DFMEA)
3	Process flow diagram
4	Process Failure Mode and Effects Analysis (PFMEA)
5	Control plan
6	Measurement System Analysis Studies
7	Initial process capability studies
8	Packaging, labelling standard and documentation
9	First Article Inspection
10	Customer-specific requirements
10.1	Dimensional/Non-Dimension results
10.2	Initial manufacturing performance studies
11	PPAP Approval Form (or equivalent)

PPAP Submission - Evidence

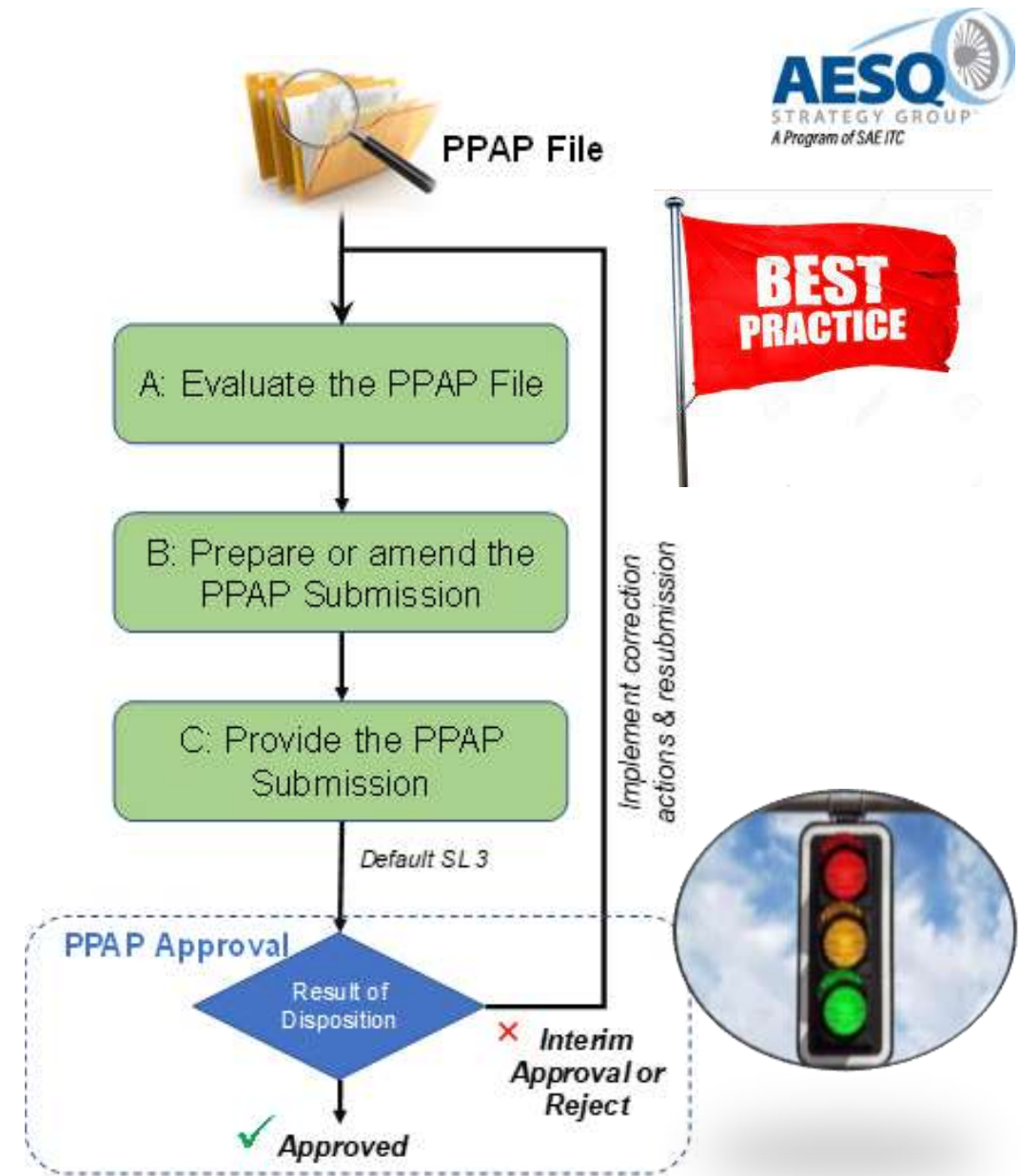
Submission is defined by the customer.

Five levels – See Table 11, AS13100

Default is Level 3

Submission levels vary based on what is retained vs. submitted to the customer.

Some elements allow for on-site witnessing by customer.



PPAP Submission

Table 11 - Submission/retention levels

PPAP ELEMENT NUMBER	AESQ PPAP ELEMENT	SUBMISSION LEVEL				
		SL1	SL 2	SL 3	SL 4	SL 5
1	Design Record	SR	SR	SR	CR	SRW
2	Design FMEA	R ^[1]	R ^[1]	SR ^[1]	CR ^[1]	SRW ^[1]
3	Process flow diagram	R	R	SR	CR	SRW
4	Process FMEA	R	R	SR	CR	SRW
5	Control plan	R	SR	SR	CR	SRW
6	Measurement System Analysis verification	R ^[2]	R ^[2]	SR ^[2]	CR ^[2]	SRW ^[2]
7	Initial process capability studies	R	SR	SR	CR	SRW
8	Packaging, labelling standard, and documentation	R	R	SR	CR	SRW
9	First Article Inspection	R ^[3]	SR ^[3]	SR ^[3]	CR ^[3]	SRW ^[3]
10	Customer-specific requirements	R	SR	SR	CR	SRW
10.1	Dimensional/Nondimensional results	R	SR	SR	CR	SRW
10.2	Initial manufacturing performance studies	R	R	SR	CR	SRW
11	PPAP Approval Form (or equivalent)	SR	SR	SR	CR	SR

[S] – Submit to Customer

[R] – Retain at supplier, available upon request

[W] – Witness, on-site

[C] – [S] and/or [W]

PPAP Approval Form

Purpose: Communicate acceptance of PPAP

Multiple formats accepted

Includes PPAP Status

<input type="checkbox"/> Approved	<input type="checkbox"/> Interim Approval	<input type="checkbox"/> Rejected
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AS9145 5.3.1 Production Part Approval Process Submission Disposition The PPAP submission shall be dispositioned as follows:

- a. **Approved** – Indicates that all PPAP requirements have been fulfilled. The organization is therefore authorized to ship product.
- b. **Interim Approval** – Indicates that all PPAP requirements have not been fulfilled; however, the organization is authorized to ship product under the conditions/restrictions specified by the customer.
- c. **Rejected** – Indicates that the PPAP requirements have not been fulfilled and the organization is not authorized to ship product

PPAP APPROVAL						
1. Part Number:				6. Additional Changes:		
2. Part Name:				7. Customer Purchasing Representative:		
3. Part Revision Level:				8. Purchase Order Number:		
4. Drawing Number:						
5. Drawing Revision Level:						
SUPPLIER INFORMATION						
9. Organization Name:				10. Supplier/Vendor Code:		
11. Address (Street, City, State, Country, Postal Code):				Country:		
12. Submission						
<input type="checkbox"/> Full Submission			<input type="checkbox"/> Initial Submission			
<input type="checkbox"/> Partial Submission			<input type="checkbox"/> Resubmission Reason: _____			
13a. PPAP ELEMENTS PROVIDED				13b. CUSTOMER PPAP ELEMENT ACCEPTANCE (Customer use only)		
Yes	No	N/A	ELEMENT DESCRIPTION	Yes	No	CUSTOMER COMMENTS
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Design Records	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Design Risk Analysis (e.g., DFMEA)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Process Flow Diagram	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Process FMEA	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Control Plan	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Measurement System Analysis	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Initial Process Studies	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Packaging, Preservation, and Labelling Approvals	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. First Article Inspection Report	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Customer Specific PPAP Requirements	<input type="checkbox"/>	<input type="checkbox"/>	
15. Declaration						
I, the supplier, submit this PPAP Approval form as declaration of having met all applicable requirements of the 9145 standard, except as noted above, including having implemented the requirements at the sub-tier level where applicable. I further certify that our production process meets all defined product delivery, engineering and quality requirements. I understand that the approval of this form by the customer does not release me from responsibility or liability for any non-conformances.						
Clearly Print Name and Sign			Title	Email Address		Date
16. Customer Use Only						
<input type="checkbox"/> Approved			<input type="checkbox"/> Interim Approval		<input type="checkbox"/> Rejected	
Comments						
Customer Authorization: Clearly Print Name and Sign			Title	Email Address		Date

Resubmission of PPAP

AS9145, Section 5.4:

A PPAP resubmission is required when a **previously approved product** or process undergoes a change (reference 9102 standard) or for a correction of a discrepancy on a previous submission.

Previously approved product = Previous submission

OR

Previously approved product = Previously approved FAI (Existing/Legacy)

Reference section on Demystifying APQP for Management of Change

DEMYSTIFYING APQP PHASES 1 TO 4 AND THE LINK WITH PPAP



KARL EVANS
APQP TECHNICAL PROJECT MANAGER
ROLLS-ROYCE

I am one of the original writing team members who released AS91945 and Team lead for AS13100 APQP and PPAP. Since 2011 I have been actively involved in the deployment of PPAP and in recent years APQP. During my career I have worked in many functional roles and involved in various industries. This helps be to relate to APQP and PPAP in the context of cross functional team working and usage during NPI, design change, Works Transfers and manufacturing process changes.

AS13100 APQP and PPAP



REQUIREMENTS ARE ACHIEVABLE THROUGH GOOD PRACTICES

Requirements

V

Best Practice

AS9145 Published 2016

AS13100 Published 2021

AS13100 APQP & PPAP

AS13100 APQP & PPAP

AS9145



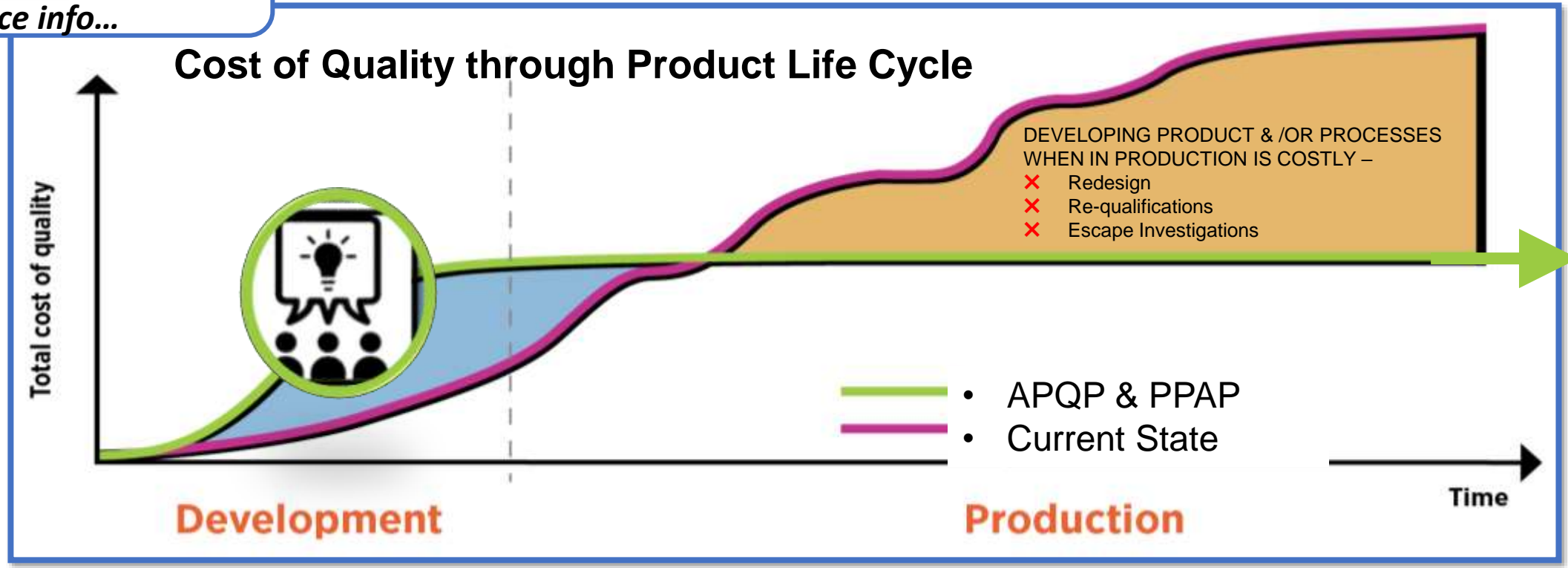
AS13100 /
RM13145
APQP &
PPAP



Why APQP & PPAP for Aerospace?



The primary objective is to **improve quality and reduce cost**. Higher quality is synonymous with **increased product safety**.



Proactive tools focuses cross-functional teams on risk identification & mitigation early in the process.

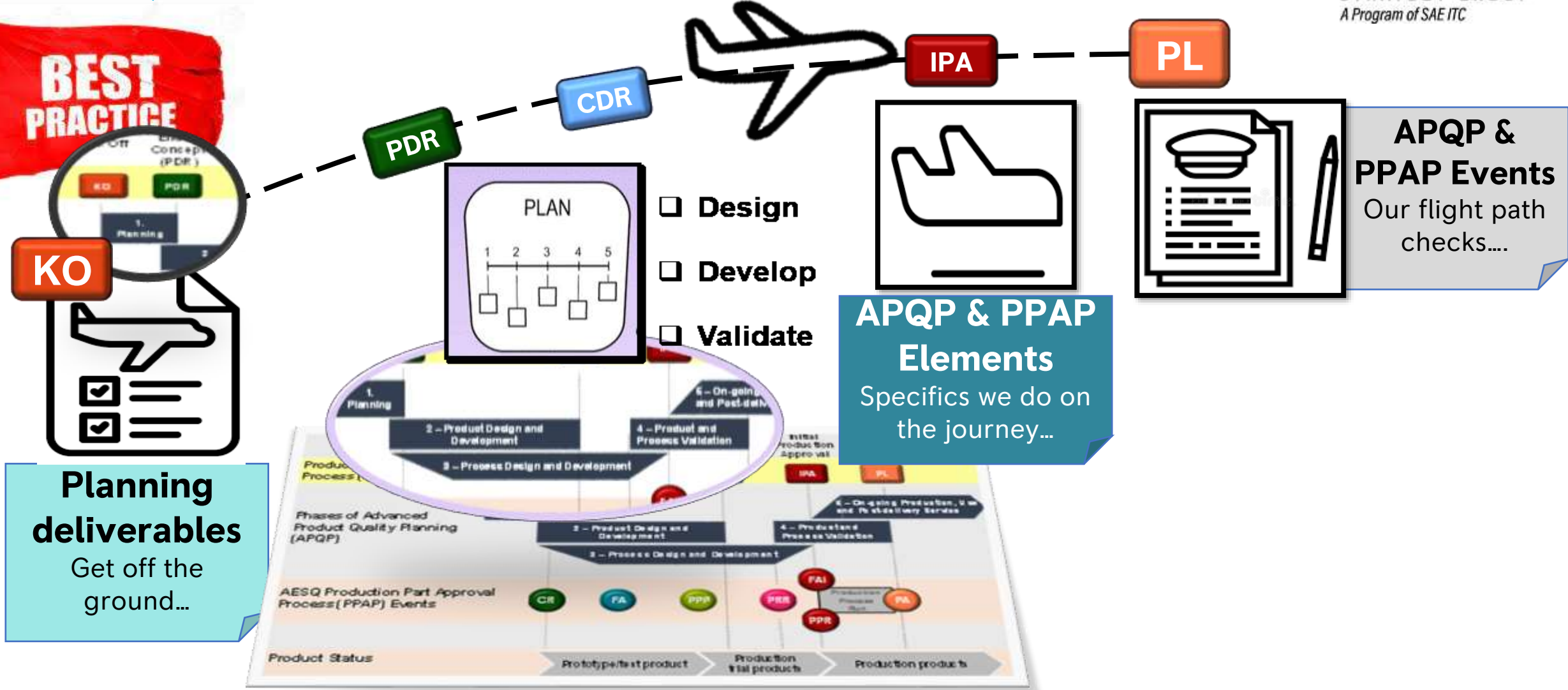


Products reach faster maturity with fewer engineering changes and defects in the early stages of production & product use.

Provides a foundation for successful ongoing change management – design and/or manufacturing change, Works Transfers

View APQP as a Flight Path

VIEW APQP AS A FLIGHT PATH FOR MANAGING PRODUCT AND / OR PROCESS CHANGE

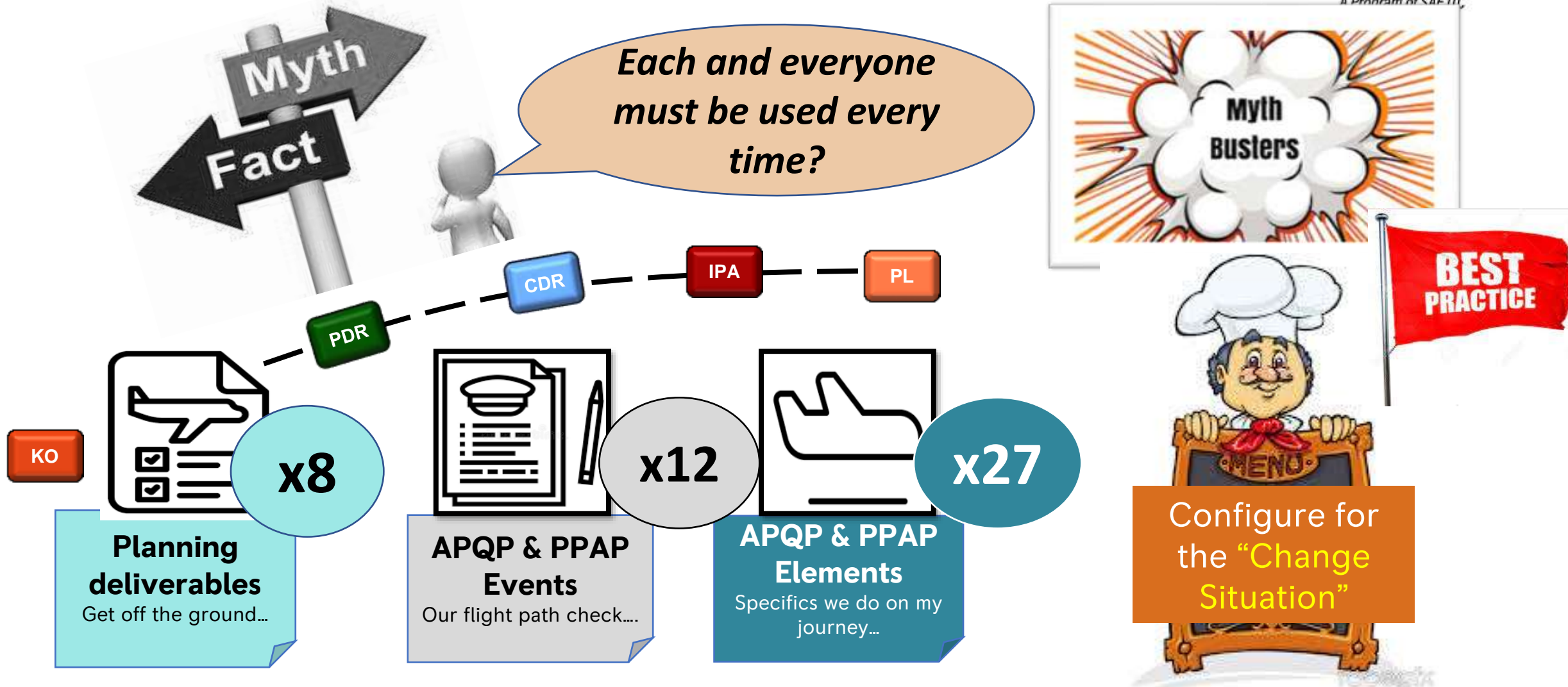


Planning deliverables
Get off the ground...

Does everything apply?

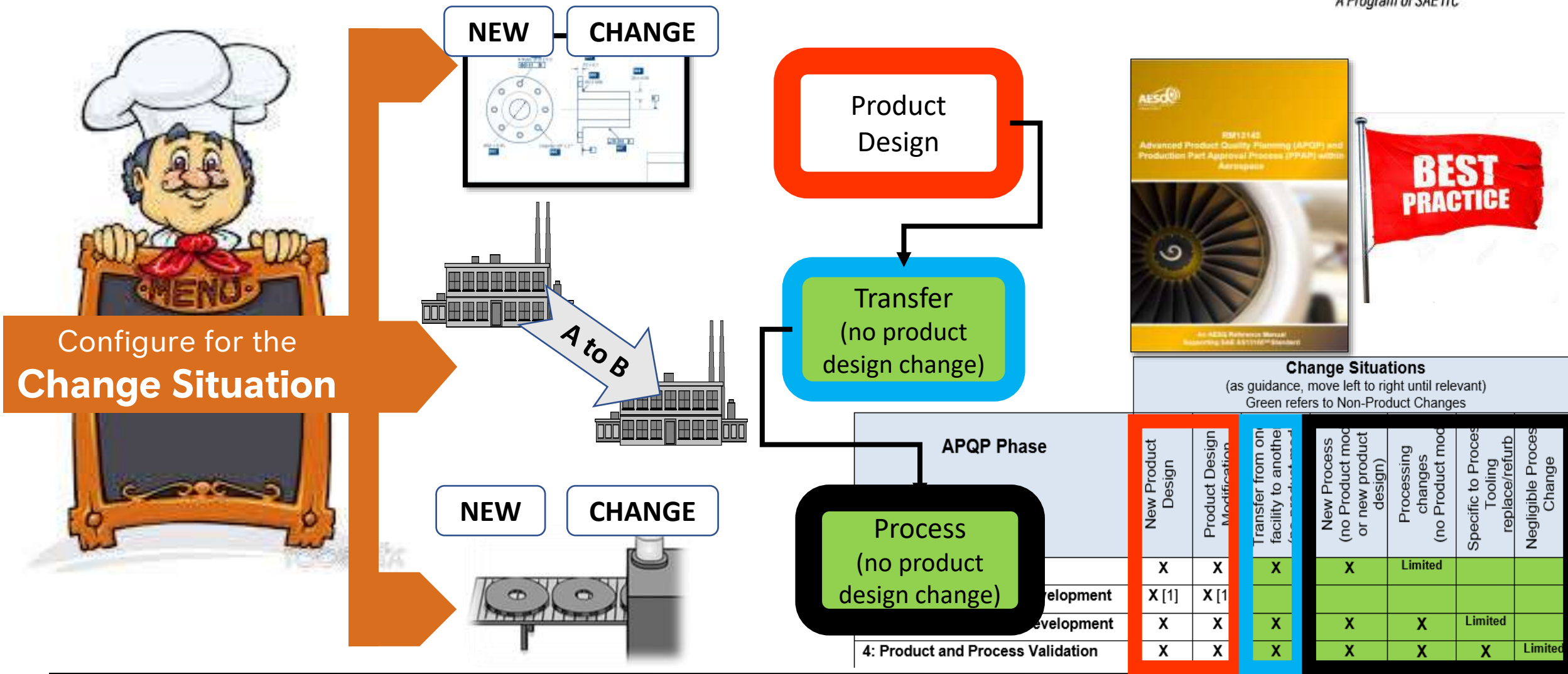
IT IS CONFIGURABLE FOR VARIOUS CHANGE SITUATIONS

009



Use of Change Situations

RM13145 MAPS CHANGE SITUATION AGAINST PHASES, EVENTS AND ELEMENTS



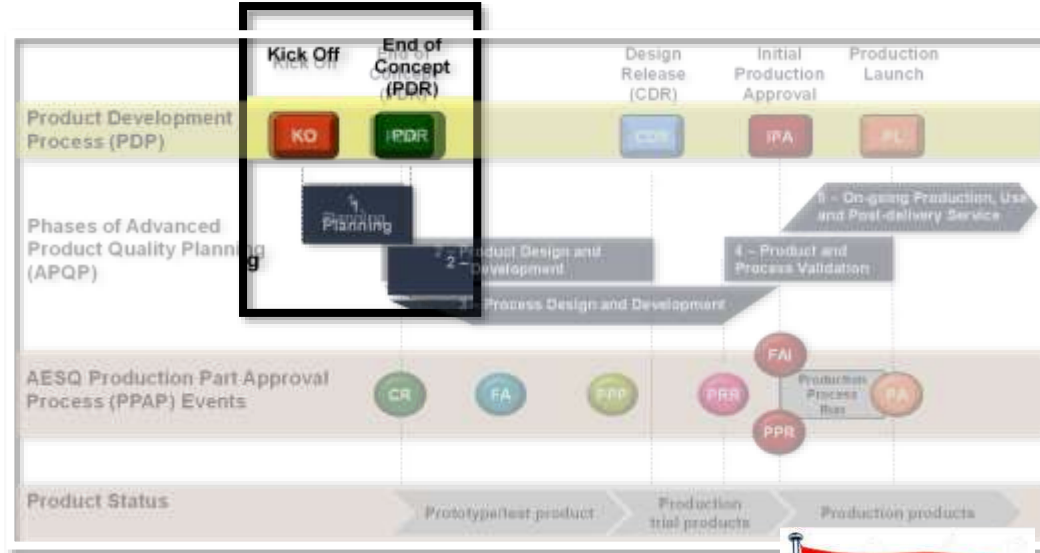
Change Situations
(as guidance, move left to right until relevant)
Green refers to Non-Product Changes

APQP Phase	New Product Design	Product Design Modification	Transfer from one facility to another	New Process (no Product or new product design)	Processing changes (no Product)	Specific to Process Tooling/replace/refurb	Negligible Process Change
Development	X	X	X	X	Limited		
Development	X [1]	X [1]					
Development	X	X	X	X	X	Limited	
4: Product and Process Validation	X	X	X	X	X	X	Limited

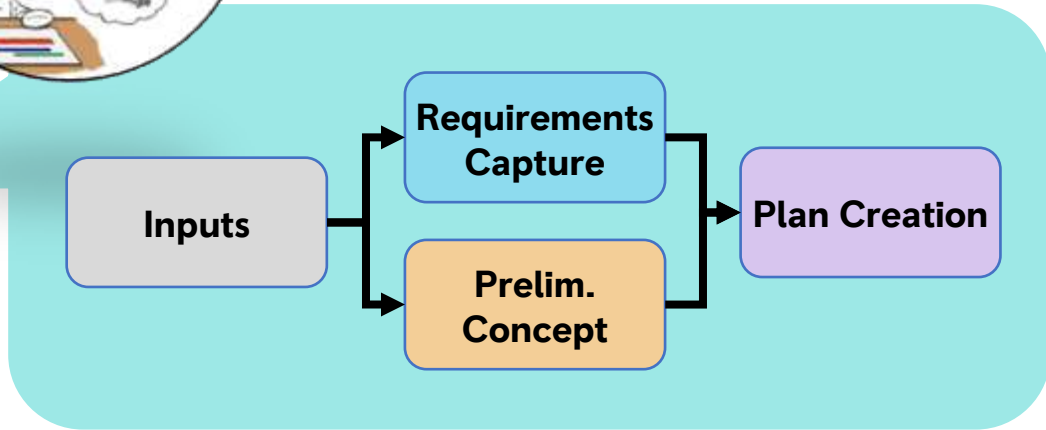
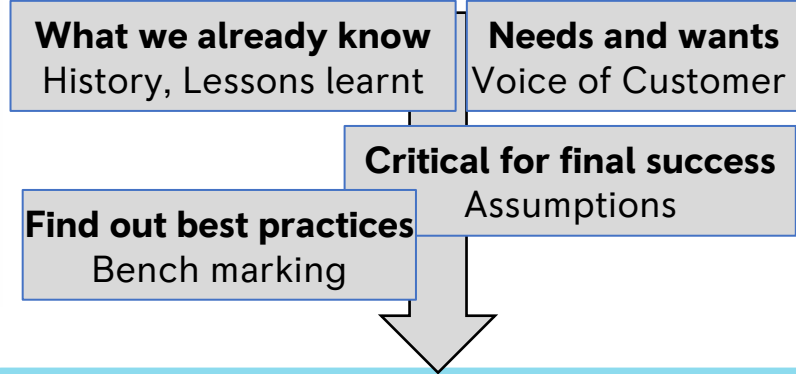
APQP Phase 1: Planning

WHEN GETTING OFF THE GROUND. ANY CHANGE SITUATION WILL BENEFIT FROM GOOD PLANNING

007



Planning deliverables

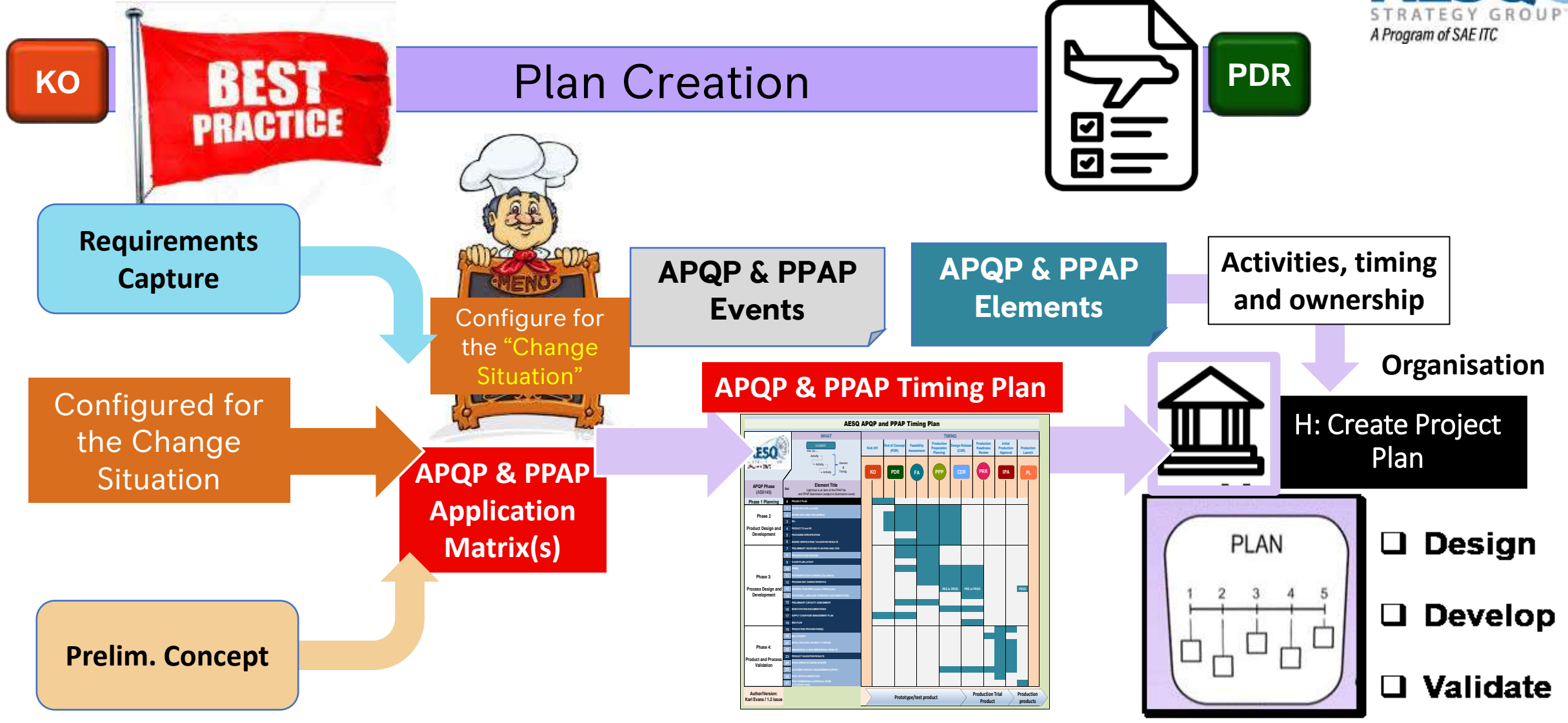


- A. Product Design Requirements/specs
- B. Project Targets
- C. Preliminary CI / KC's
- D. Preliminary BOM
- E. Preliminary process flow diagram
- F. SOW review
- G. Preliminary sourcing plan
- H. Project Plan

RM13145 Project Plan Toolbox

PRACTICES FOR CREATING THE PROJECT PLAN

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AESQ – Aerospace Engine Supplier Quality Strategy Group

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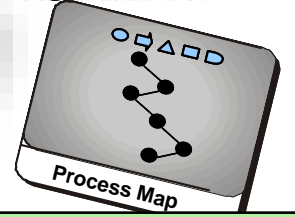
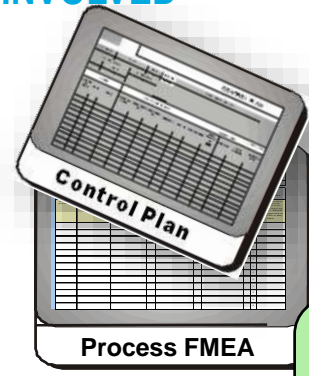
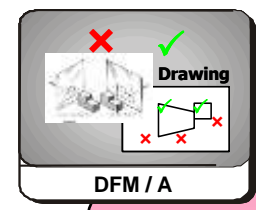
It's a Team Sport...

SUCCESS IS THROUGH CROSS FUNCTIONAL TEAM(S). RACI PROVIDE CLARIFICATION FOR THOSE INVOLVED

005



Responsible
Accountable
Consult
Inform
...For each Element

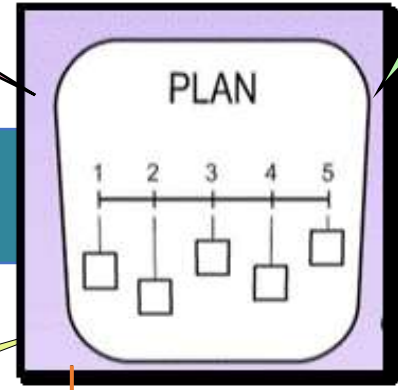


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4	5	6

8	9	10	11
12	13	14	15
16	17	18	

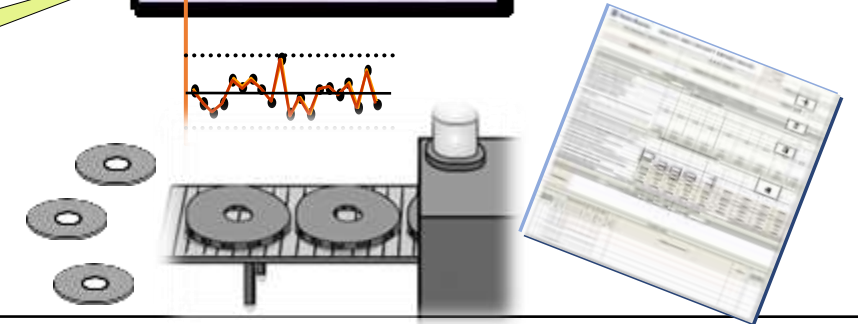
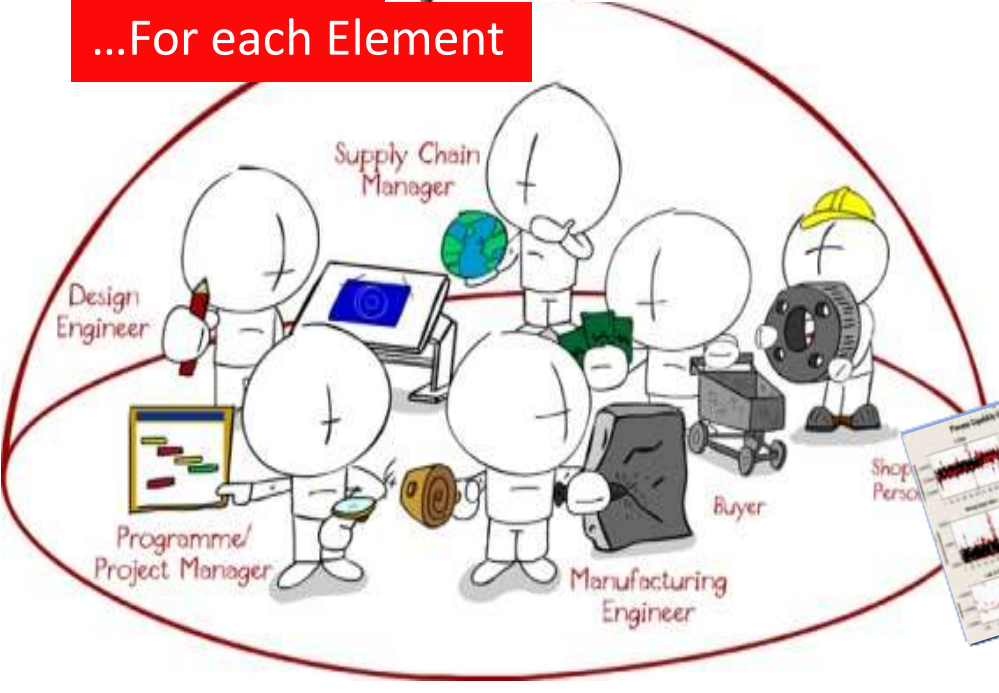
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(APQP) > Activity



- Design
- Develop
- Validate

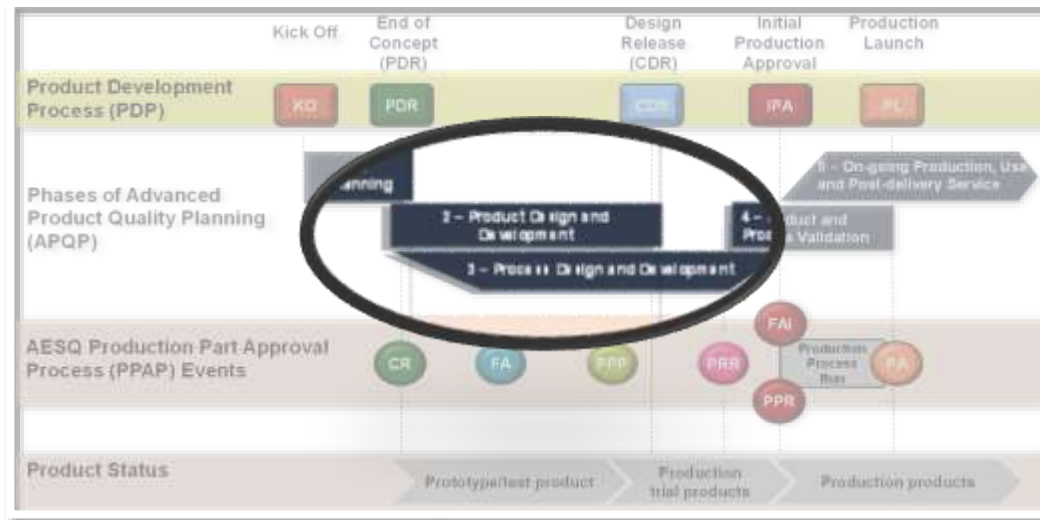
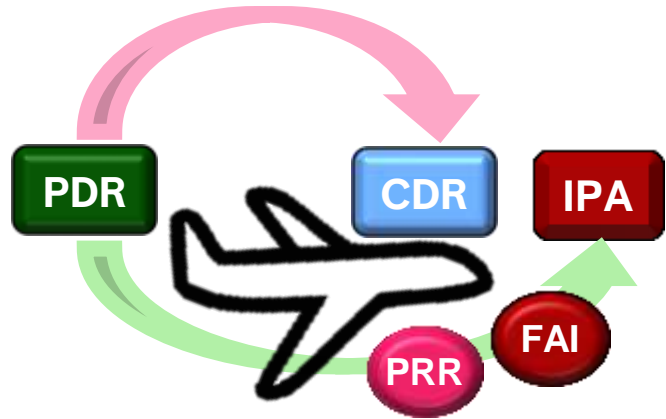
19	20	21	22	27
23	24	25	26	



APQP Phases 2 and 3 – Design and Development

THE ACTIVITIES WHEN INFLIGHT THAT DESIGN AND DEVELOP PRODUCTS AND / OR PROCESSES

004



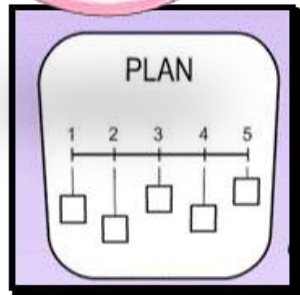
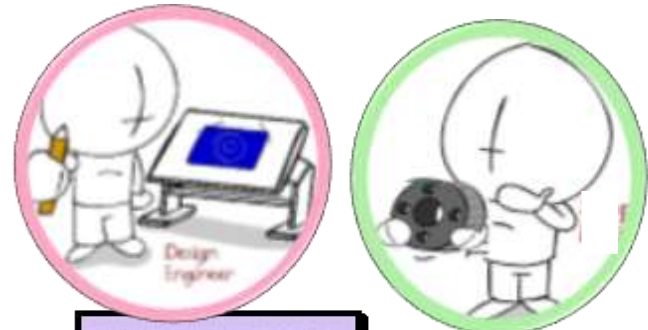
APQP & PPAP Elements

Product Design and Development

1. DESIGN RECORD and BOM
2. DESIGN RISK ANALYSIS (DFMEA)
3. DESIGN FOR MANUFACTURE
4. PRODUCT CI and KC
5. PRELIMINARY SOURCING PLAN RISK ANALYSIS
6. PACKAGING SPECIFICATION
7. DESIGN VERIFICATION/VALIDATION RESULTS

Process Design and Development

8. PROCESS FLOW DIAGRAM
9. FLOOR PLAN LAYOUT
10. PFMEA
11. TEST / INSPECTION PLAN
12. PROCESS KEY CHARACTERISTICS
13. CONTROL PLAN (Pre-Launch / Production)
14. PACKAGING, PRESERVATION, LABEL/PART MARKING
15. PRELIMINARY CAPACITY ASSESSMENT
16. WORK STATION DOCUMENTATION
17. SUPPLY CHAIN RISK MANAGEMENT PLAN
18. MSA PLAN

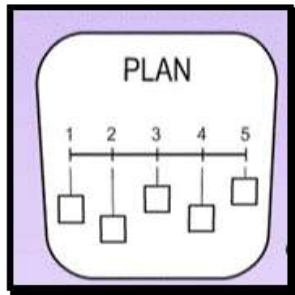
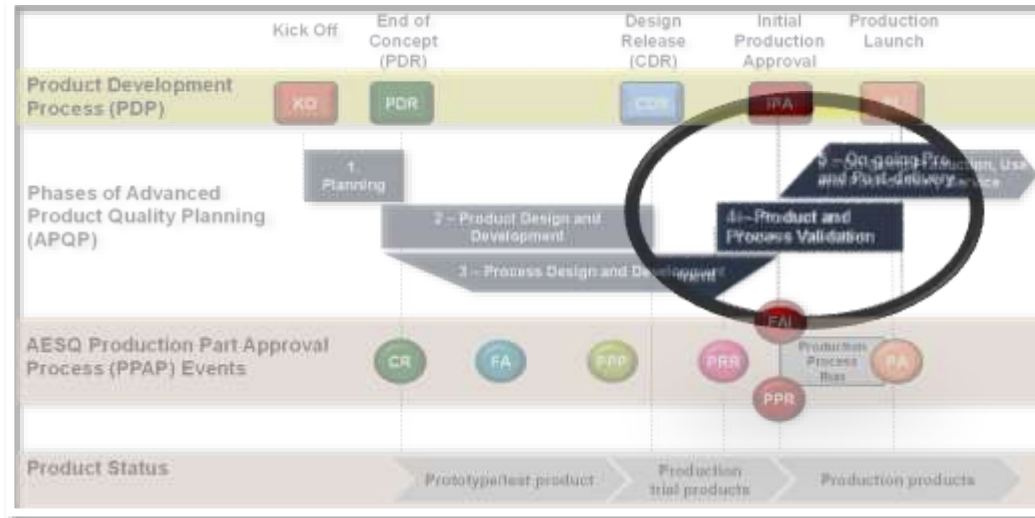
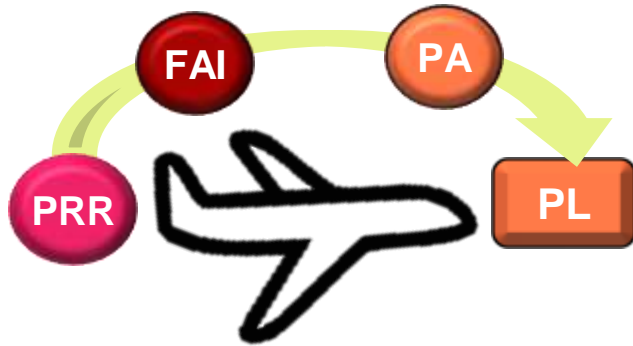


- Design
- Develop
- Validate

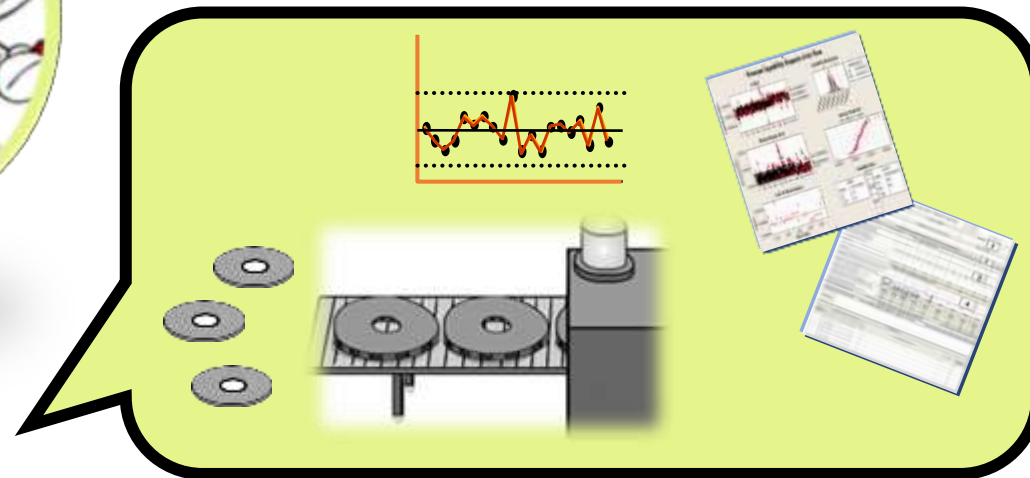
APQP Phases 4 – Validation

THE ACTIVITIES WHEN IN FLIGHT THAT VALIDATE PRODUCTS AND / OR PROCESSES

003



- Design
- Develop
- Validate



APQP & PPAP Elements

Product & Process Validation

19. PRODUCTION PROCESS RUN(S)
20. MSA STUDIES
21. INITIAL PROCESS CAPABILITY STUDIES
22. DIMENSIONAL and NON-DIMENSIONAL RESULTS
23. PRODUCT VALIDATION RESULTS
24. INITIAL MANUFACTURING PERFORMANCE STUDIES
25. CUSTOMER SPECIFIC REQUIREMENTS (PPAP)
26. FIRST ARTICLE INSPECTION
27. PPAP SUBMISSION (incl. Approval Form)

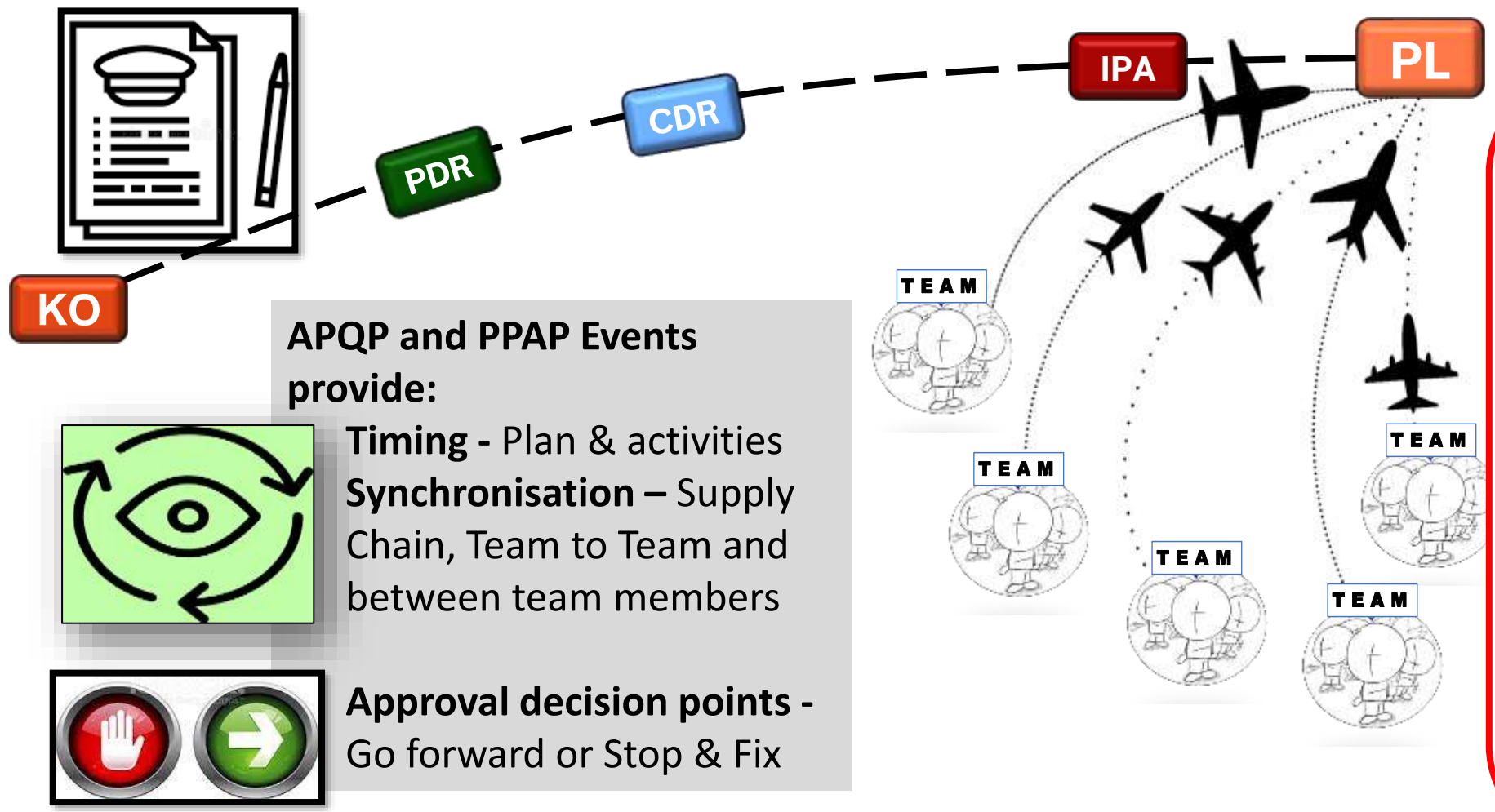


“Without data you’re just another person with an opinion”

- W. Edwards Deming

APQP and PPAP Event Management and Behaviours

APQP AND PPAP EVENTS GUIDE TIMING, SYNCHRONIZATION AND APPROVAL POINTS



APQP and PPAP Events provide:

- Timing - Plan & activities
- Synchronisation – Supply Chain, Team to Team and between team members
- Approval decision points - Go forward or Stop & Fix

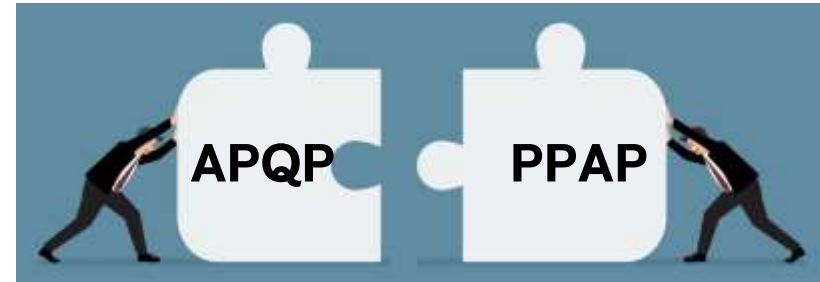
RM13145 Events & Pass Criteria

- ✓ Behaviours -Promote transparency of results & leadership values
- ✓ Build into your organisations Project Management & Review structures
- ✓ Clarify your RAPID per Event

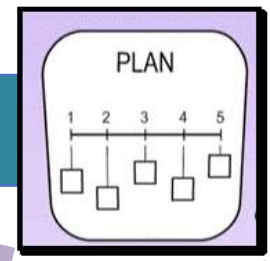
Recommend
Agree
Perform
Input
Decide
...google

What about PPAP?

APQP IS THE SAT NAV (ACTIVITIES). PPAP IS THE TRAFFIC LIGHT (EVIDENCE)

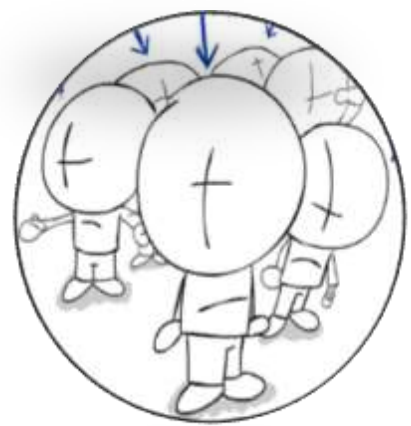


(APQP) > Activity

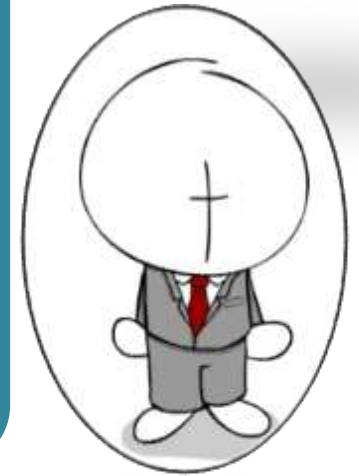
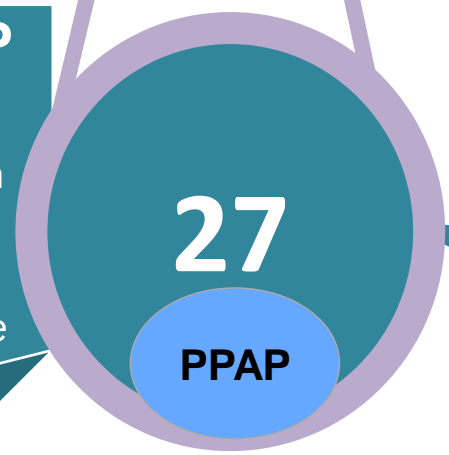


- Design
- Develop
- Validate

(PPAP) > Evidence



APQP & PPAP Elements
Specifics we do on my journey...
Activity v Evidence



DEMYSTIFYING APQP PHASES 5

ROBERT LATOUR
RUSSELL PALMITER



Technical Fellow for Manufacturing Process Control at Pratt & Whitney. He is responsible for the discipline strategy, procedures, proficiency and discipline health for process control methods across the company. In his 19-year career, Rob has held positions applying process control in Manufacturing Engineering, Module Engineering and Quality. He has been actively involved with the deployment of APQP and PPAP at Pratt & Whitney and across Raytheon Technologies. Rob is a Six Sigma Master Black Belt and holds a BS in Mechanical Engineering from Rochester Institute of Technology and a MS in Industrial Process Management from Rensselaer Polytechnic Institute.

Manage a Change for a Product in Production

APQP AND PPAP BENEFIT BOTH NEW PRODUCT DESIGN AS WELL AS CHANGE TO PRODUCT AND PROCESS

- Repeat APQP as an improvement cycle when triggered by product and/or process change
- Application of APQP and PPAP vary depending on change situation
- Utilize APQP to manage project targets, understand impact and risks of change as well as validate implementation
- Change situations
 - New product or product modification: Full application of APQP & PPAP
 - New facility or manufacturing process: Application of manufacturing related requirements
 - Process changes: Application of manufacturing related requirements appropriate to the scope of the change



APQP Phase	Change Situations (as guidance, move left to right until relevant) Green refers to Non-Product Changes						
	New Product Design	Product Design Modification	Transfer from one facility to another (no product mod.)	New Process (no Product mod or new product design)	Processing changes (no Product mod.)	Specific to Process Tooling replace/refurb	Negligible Process Change
1: Planning	X	X	X	X	Limited		
2: Product Design and Development	X [1]	X [1]					
3: Process Design and Development	X	X	X	X	X	Limited	
4: Product and Process Validation	X	X	X	X	X	X	Limited

Meaning (level of application):
 X – Application in accordance to requirements.
 Limited – Application will be small scale.
 Blank – Application is unlikely.

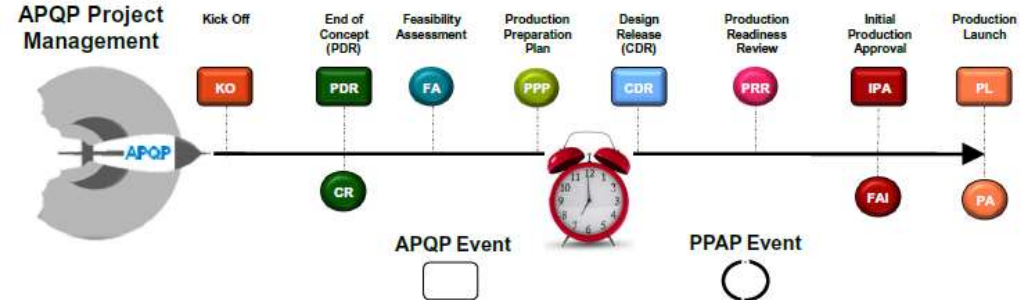
[1] - Application by the organization of this phase will depend on their design and/or manufacturing responsibility. E.g.: Organizations that do not have design responsibility have limited requirements to fulfil in APQP Phases 2.

APQP & PPAP Events for a Change

CONNECT EVENTS WITH TIMING PLAN WILL ENSURE SUCCESSFUL PROJECT MANAGEMENT

- Configure events for the type of change

- KO** – **KO**: Evaluate scope of change including technical, quality and cost targets and timeline
- PDR** – **PDR** for process change: Demonstrate that the preliminary proposed process will meet customer requirements with acceptable risk and constraints
- FA** – **FA**: Assess confidence that new process has potential to produce product design during production
- PPP** – **PPP**: Planning for new or modified process resources is suitable for the level of complexity being managed
- CDR** – **CDR**: Applicable for new product design or design changes only
- PRR** – **PRR**: New production process is appropriately defined, documented and ready for production
- IPA** – **IPA**: Demonstrate that products produced with new or modified process meet defined design intent
- PA** – **PA**: Confirm performance of the new or modified process against quality targets
- PL** – **PL**: Confirm that new or modified process demonstrates controlled and capable full-scale production



Events	Change Situations (as guidance, move left to right until relevant) <small>Green refers to Non-Product Changes</small>						
	New Product Design	Product Design Modification	Transfer from one facility to another (no product mod.)	New Process (no Product mod or new product design)	Processing changes (no Product mod)	Specific to Process Tooling replace/refurb	Negligible Process Change
Kick-Off	KO	Y	Y	Y	Y	Y	Y
End of Concept (PDR)	PDR	Y	Y	Y	Y	Y	Y
Customer Specific Requirements	CR	Y	Y	Y	Y	Y	Y
Feasibility Assessment	FA	Y	Y	Y	Y	Y	Y
Production Preparation Plan	PPP	Y	Y	Y	Y	Y	Y
Design Release (CDR)	CDR	Y	Y	Y	Y	Y	Y
Production Readiness Review	PRR	Y	Y	Y	Y	Y	Y
Production Process Run start	PRR	Y	Y	Y	Y	Y	Y
First Article Inspection	FAI	Y	Y	Y	Y	Y	Y
Initial Production Approval	IPA	Y	Y	Y	Y	Y	Y
PPAP Approval	PA	Y	Y	Y	Y	Y	Y
Production launch	PL	Y	Y	Y	Y	Y	Y

Meaning (level of application):
 Y – this event is used
 Blank – this event is unlikely to be used

APQP and PPAP Elements for a Change

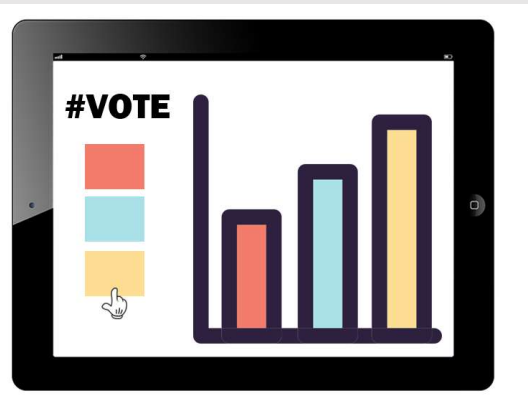
SCOPE APPLICABLE ELEMENTS TO DOCUMENT AND APPROVE SUCCESSFUL CHANGE

- Scope the APQP & PPAP Elements based on the potential impact on the change
- For a new or modified process:
 - Evaluate and update the process design documents (e.g., PFD, PFMEA, Floor Plan Layout) to assess the potential impact and risk of the change
 - Understand supply chain impacts through capacity assessment and supply chain risk management plan
 - Validate implementation of the change through updates MSA studies, initial process capability studies, etc. within the scope of the change
 - Complete FAI and PPAP approval



APQP and PPAP Elements	Change Situations (as guidance, move left to right until relevant) Green refers to Non-Product Changes						
	New Product Design	Product Design Modification	Transfer from one facility to another (no product mod.)	New Process (no Product mod or new product design)	Processing changes (no Product mod)	Specific to Process Tooling replace/refurb	Negligible Process Change
DESIGN RECORD and BOM *	X [1]	X [1]					
DESIGN RISK ANALYSIS (DFMEA)	X [1]	X [1]					
DESIGN FOR MANUFACTURE	X [1]	X [1]					
PRODUCT CI and KC *	X [1]	X [1]					
PACKAGING SPECIFICATION	X [1]	X [1]					
DESIGN VERIFICATION/VALIDATION RESULTS	X [1]	X [1]					
PRELIMINARY SOURCING PLAN RISK ANALYSIS	X	X [4]	X	X [4]	X [4]		
PROCESS FLOW DIAGRAM	X	X	X	X	X		
FLOOR PLAN LAYOUT	X	X	X	X	X		
PACKAGING, LABELLING, ETC	X	X	X	X	X		
TEST INSPECTION PLAN (Char. Matrix)	X	X	X	X	X		
PFMEA	X	X	X	X	X		
PROCESS KEY CHARACTERISTICS	X	X	X	X	X		
CONTROL PLAN (Pre-Launch / Production)	X	X	X	X	X		
PRELIMINARY CAPACITY ASSESSMENT	X	X	X	X	X		
WORK STATION DOCUMENTATION	X	X	X	X	X		
SUPPLY CHAIN RISK MANAGEMENT PLAN	X	X [4]	X	X [4]	X [4]		
MSA PLAN	X	X	X	X	X	X	
PRODUCTION PROCESS RUN(S)	X	X	X	X	X	X	
MSA STUDIES	X [2]	X [2]	X [2]	X [2]	X [2]	X [2]	
INITIAL PROCESS CAPABILITY STUDIES	X [P]	X [P]	X [P]	X [P]	X [P]	X [P]	
DIMENSIONAL and NON-DIMENSIONAL RESULTS	X	X	X	X	X	X	
PRODUCT VALIDATION RESULTS	X [P]	X [P]	X [P]	X [P]	X [P]	X [P]	
INITIAL MANUFACTURING PERFORMANCE STUDIES	X	X	X	X	X		
CUSTOMER SPECIFIC REQUIREMENTS (PPAP)	X	X	X	X	X	X	
FIRST ARTICLE INSPECTION	X	X [3]	X [3]	X [3]	X [3]	X [3]	X [3]
PPAP SUBMISSION (Inc. Approval Form)	X	X	X	X	X	X	

Key:
 * When no new product design or modification is taking place (green zone). These are represented by the established Design Record, Product Specifications and BoM.
 X - Mandatory if Customer and/or Regulator and/or AS13100 require this, otherwise recommended. Either:
 • Create new.
 • Update the existing
 • Develop in part aligned to what has changed.
 X [NOTE] – as above X and consider these Notes:
 [P] - apply in accordance to product specific requirements related to the Design Record and associated specification (E.g.: KC's)
 [1] - for design responsible organizations only
 [2] - When specified by the related MSA Plan (Phase 3 of APQP)
 [3] - RM13102, consideration to LAI maybe likely
 [4] - when supply chain has the potential to be impacted



Becky Lemon
Industry Program Manager
SAE ITC

Please answer the **Survey Questions** when asked (they are anonymous).

(a) Use the poll function...

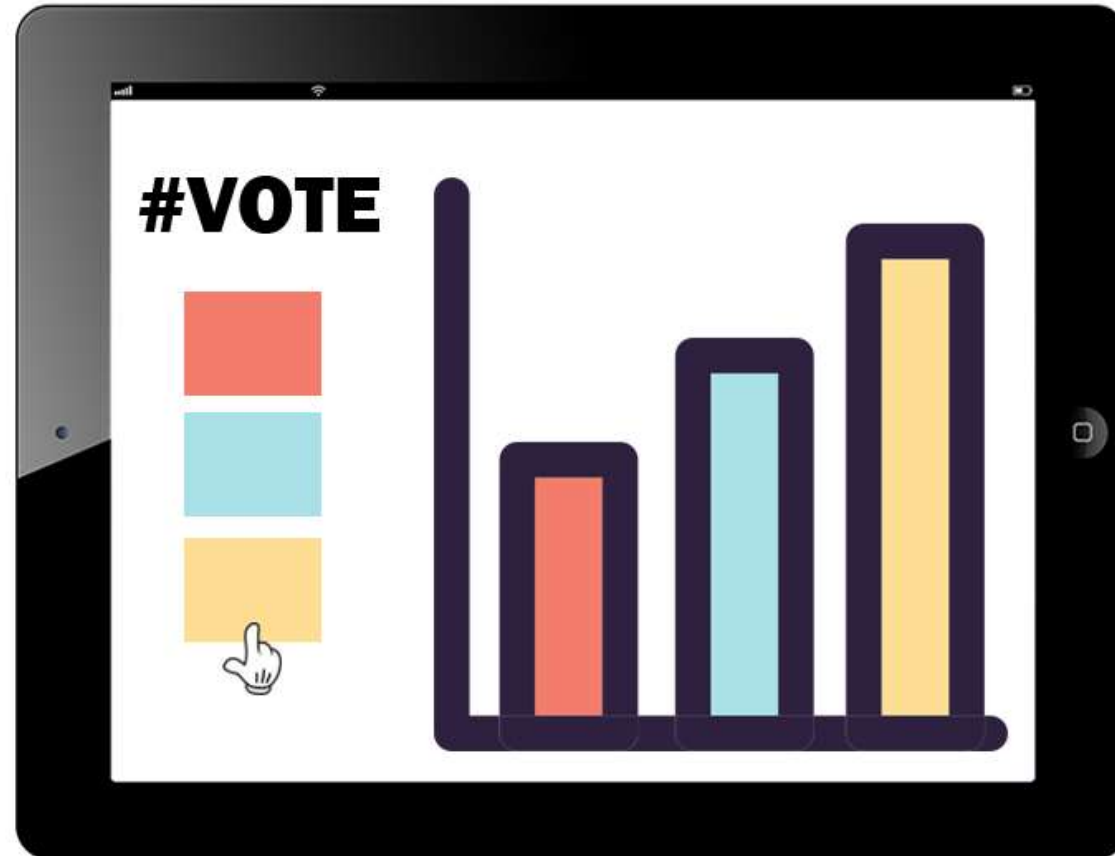
How well is your business in deploying APQP?

1. **Not capable** and have **no plan** to facilitate capability.
2. **Not capable** and **have a plan** to facilitate capability.
3. **Capable** and have **no improvement plan** to increase capability.
4. **Capable** and have **an improvement plan** to increase capability.

(b) Use the chat function...

What addition topics would you like use to cover in future webinars?

VIEW THE POLLING RESULTS



Q & A SESSION

USE THE “CHAT” FUNCTION
TO ASK A QUESTION...



AESQ – Aerospace Engine Supplier Quality Strategy Group

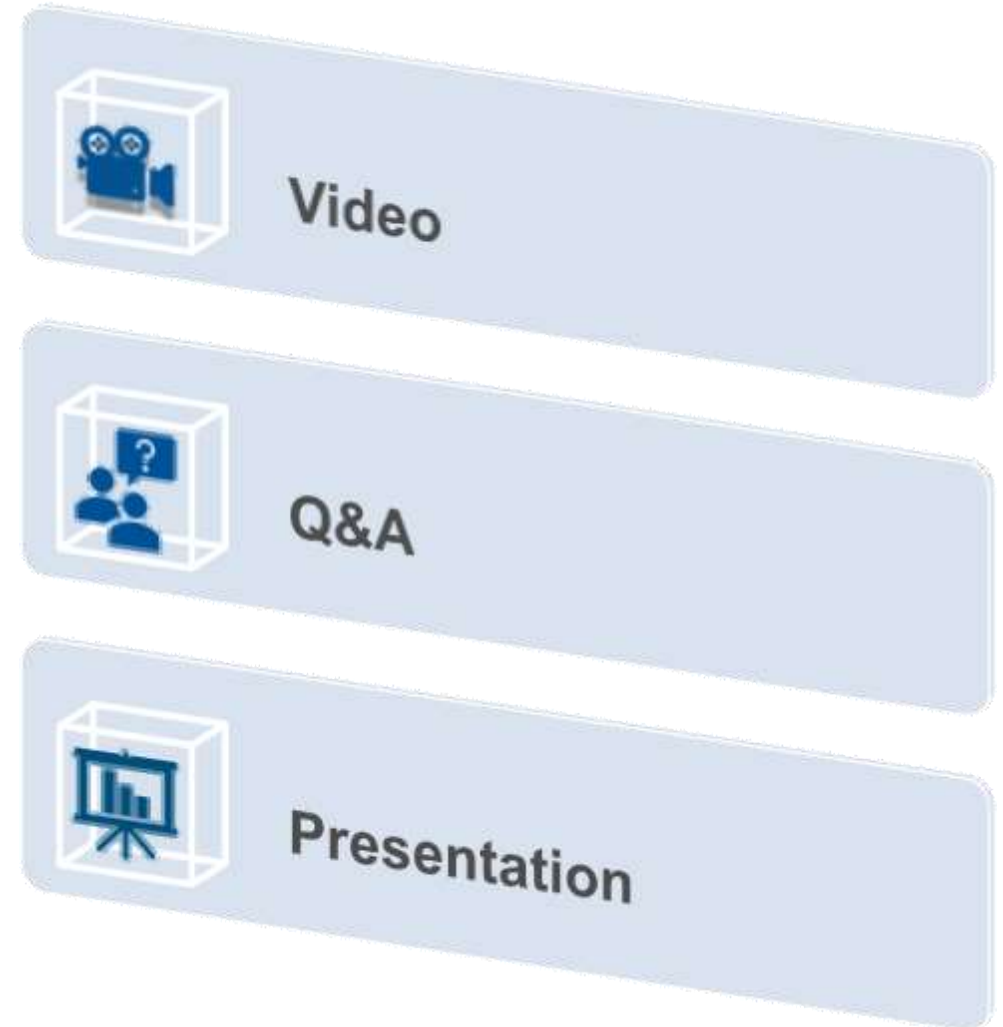
This document slide does not contain ITAR or EAR technical data. The content of this presentation slide is proprietary and confidential information of the AESQ. It is not permitted to be distributed to any third party without the written consent of the AESQ.

SUMMARY & CLOSE

Summary

All resources will be available on the AESQ website within a few days.

An email will be sent to all registrants with a link.





THANK YOU FOR PARTICIPATING

How to Answer Live Poll Questions (September 28)

1. Scan the QR Code with your cell phone

2. Enter the Password

zsh8vd

3. Answer Polls Questions



How to Answer Live Poll Questions (September 29)

1. Scan the QR Code with your cell phone
2. Enter the Passcode
5fbezf
3. Answer Polls Questions

