# WELCOME

## AESQ Supplier Forum

# LOGISTICS

# Logistics


# Agenda

| | | |
|---|---|---|
| 8:00 | Welcome | |
| 8:30 | Introduction Overview | Martin Schaeffner – MTU |
| 9:20 | Industry Perspective | Dan Jacob- LNS |
| 9:40 | Manufacturer's Perspective | Dele Awofala – Pratt & Whitney |
| 10:00 | Engines Certification | Olivier Castets - Safran |
| 10:15 | Break & Survey | Earl Capozzi – Pratt & Whitney |
| 10:30 | Overview of AESQ Standards | Osa Omoruyi - Arconic |
| 10:50 | Market Place #1 | Group- 00, 01A, 02, 03, 04 (15 minutes) |
| 12:15 | Lunch | |
| 1:15 | Benefits of the AESQ Standards | Helen – GKN, Bhu- PCC, Martin- MTU |
| 1:45 | Overview of DRAFT AESQ Standards | John Calder – Rolls Royce |
| 2:15 | Market Place #2 | Group – 05, 06, 07, Future (15 minutes) |
| 3:15 | Break & Quiz (pass out pens) | Catherine- SAFRAN |
| 3:45 | Market Place Summary | Dele Awofala – Pratt & Whitney |
| 4:15 | Closing Remarks | Martin Schaeffner - MTU |
| 4:30 | End of Day | |

# Facilitators in the room

# PROTOCOLS

# Code of Conduct

Audio/video recording of meetings is not permitted

No Commercialism

No discussion of cost, pricing plans, pricing policies, product usage surveys, marketing plans or any related topics

Presentations must focus on technical issues (not on marketing aspects of products) and relate to or support the development or maintenance of G-22 Committee work

Be aware of and follow ITAR & EAR rules and regulations governing export control

Discussions should be open and follow the agenda or other legitimate direction agreed upon by consensus of the committee - avoid unauthorized or 'private' meetings

# Code of Conduct

Respect basic meeting etiquette:

Only one person speaking at any given time

Attack the issue, not the person

Be on time…returning from breaks/lunch

Respect all ideas & comments

No silent skepticism, be candid

Do not dominate discussions

Stay focused on the meeting & agenda

Strive for high-quality standards to benefit all stakeholders – users, customers, suppliers and the industry as a whole

Strive for an open atmosphere that promotes a free-flowing interchange of standards technical information

# OVERVIEW

# Commercial aviation – a growth market

**In 2036**

**4.5%/yr Increase in Passenger Traffic**

**2 X active aircraft worldwide**

=

**7,100 billion passenger km in 2016**

**17,000 billion passenger km in 2036**

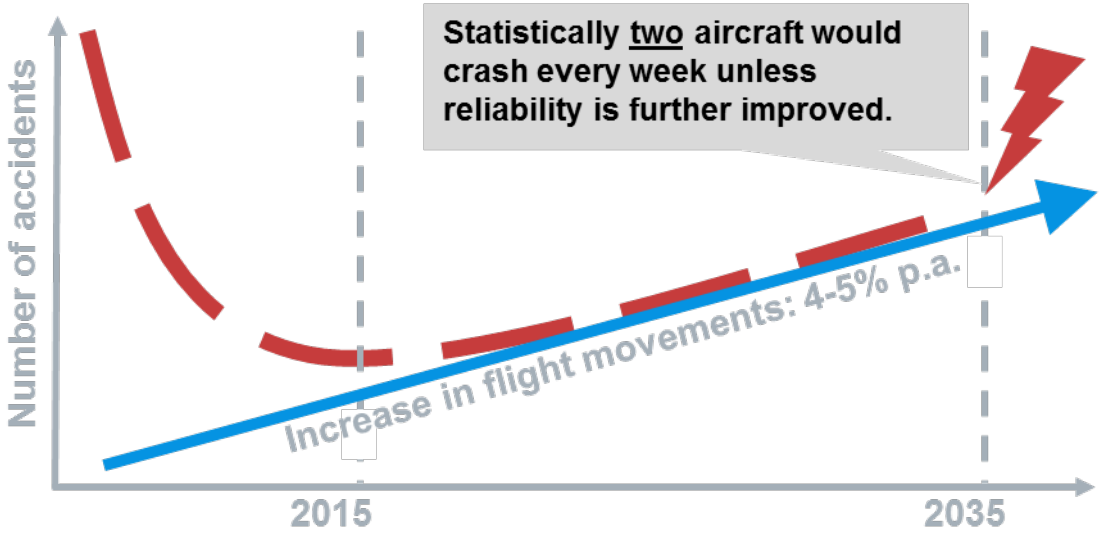
**23,000 active aircraft in 2016**

**45,000 active aircraft in 2036**

Quelle: Ascend, IATA, MTU

# Aviation Safety

**The Quality of our products and services are extremely important**
**Quality and continuous improvement are an absolute must! Link**

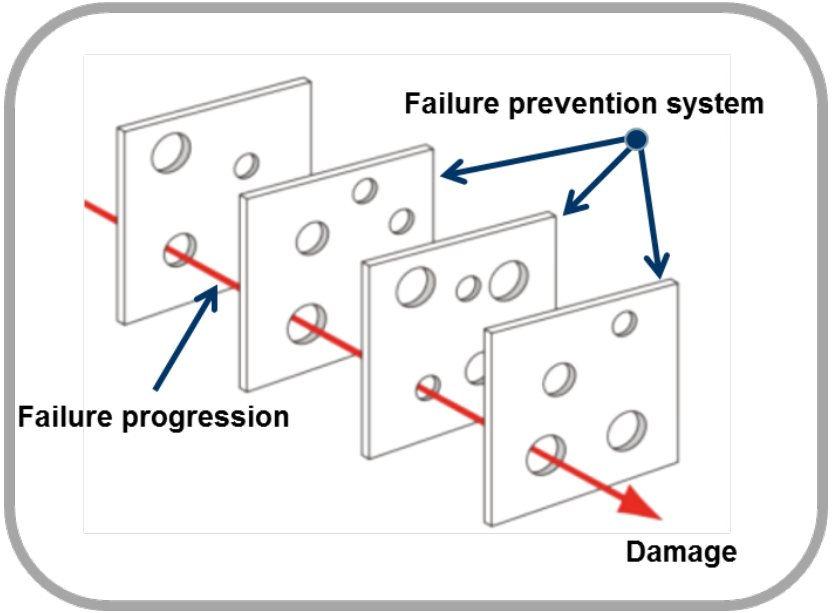



# Chain of events

**In many cases, it is not a single malfunction, error or failure that leads to a crash.**

**It is a sequence of events involving**

- **hidden (latent) failures**
- **errors of judgment/action**
- **a failure of the failure**



# AESQ Vision

**"To establish and maintain a common set of Quality Standards that enable the Global Aerospace Engine Supply Chain to be truly competitive through lean, capable processes and a culture of Continuous Improvement."**

**In Detail:**

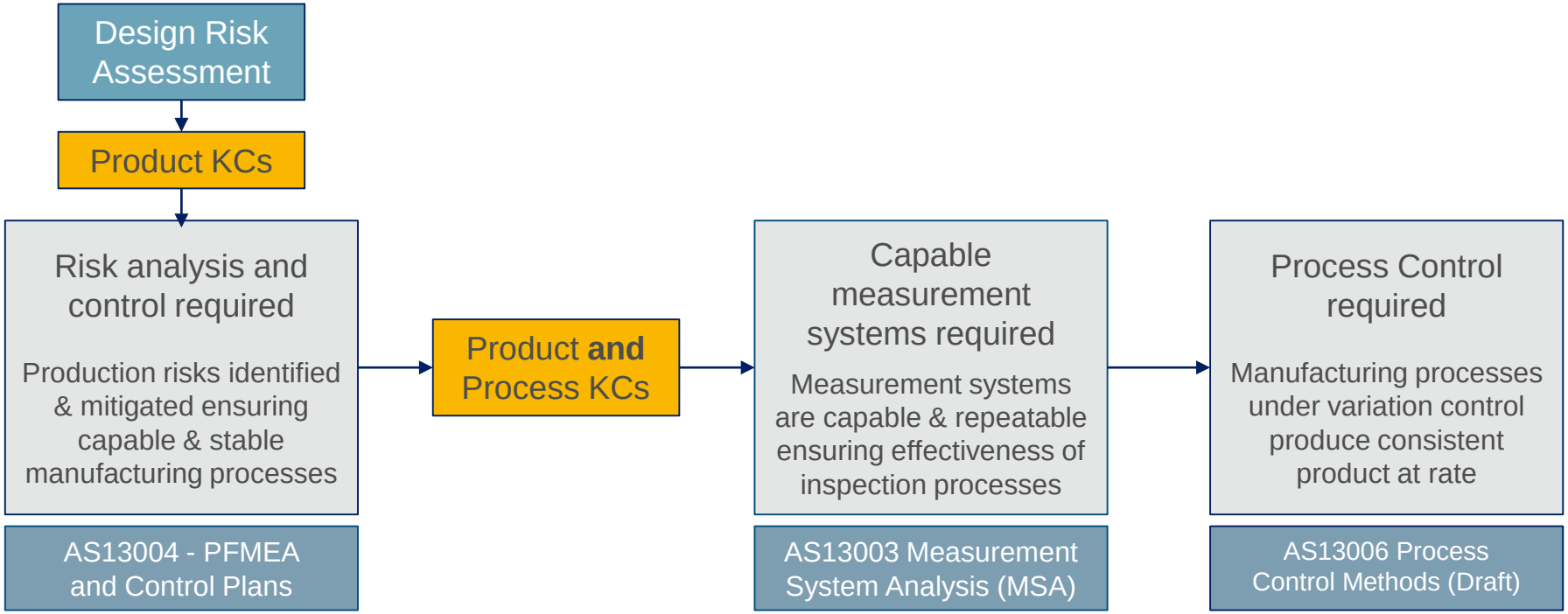
- create common quality standards for engine manufacturers & their supply chains
- deploy together the written standards throughout our supply chains
- establish capable quality processes and a culture of continuous improvement

**Main Targets:**

- to improve quality within the supply chain
- improve on time delivery and minimize costs through a reliable quality performance
- gain efficiency by standardized processes

# AESQ Key Quality Elements

## → Aligned to AS9146 APQP & PPAP




**Supporting Standards: AS13000 Problem Solving; AS13001 DPRV Training; AS13002 Inspection Frequency; In process → AS13005 Audit; AS13007 Supplier Management**

# AESQ will drive progress

- AS13000 & AS13001 & AS13002 & AS13003
  are all contractually flowed down by all AESQ members and part of **your** purchase Order

- AS13004 & AS13006 will follow shortly

# The Need for Defect Prevention


## John Calder

Head of Supplier Quality

Rolls-Royce Civil Aerospace

# How do we achieve Perfect Quality?

**100% inspection**

**Sorting good from bad**

**Concessions to accept non-conforming product**

**Overrun parts to ensure delivery commitments**

**3rd Party inspection**

# Focus on Defect Prevention
# How effective is 100% inspection?

Individually inspect the image to the standard

Items needed

Standard

Marking sheet and a pen

Compare the image to the standard and check “pass or fail”

# Standard


1
AIRBUS A380
A380


2
AIRBUS A380


3
AIRBUS A380


4
AIRBUS A380


5
AIRBUS A380


6
AIRBUS A380


7
AIRBUS A380


8
AIRBUS A380


9
AIRBUS A380


10
AIRBUS A380

# How did you do?


AIRBUS A380
A380


AIRBUS A380
AIRBUS


AIRBUS A380


AIRBUS A380


AIRBUS A380
AIRBUS


AIRBUS A380


AIRBUS A380


AIRBUS A380


AIRBUS A380
AIRBUS


20
AIRBUS A380

# Focus on defect prevention – How effective is 100% inspection?

## Mark both answer sheets against the answers below

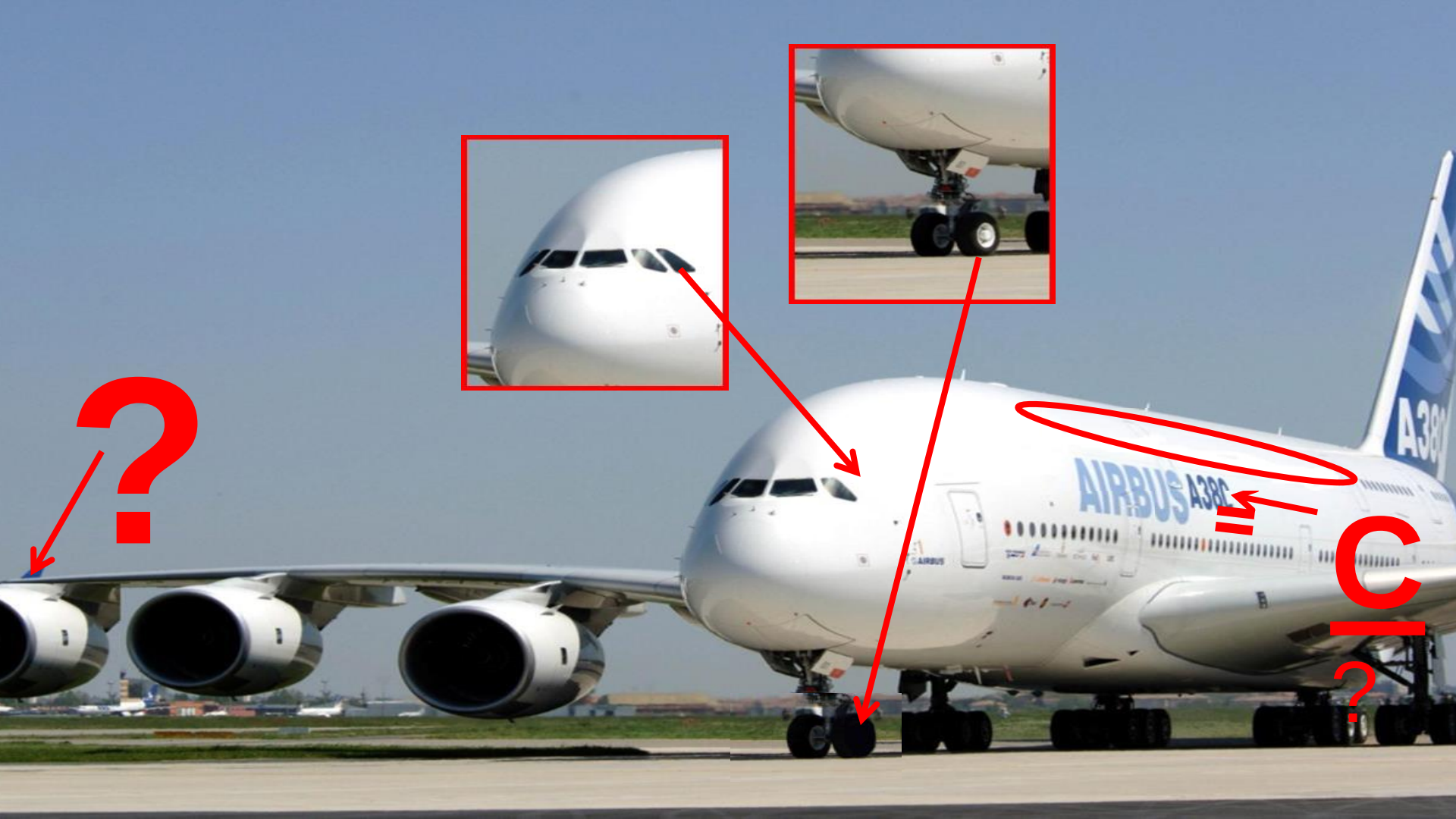
| Slide | Answer |
|---|---|
| 1 | ✔ |
| 2 | ✖ |
| 3 | ✖ |
| 4 | ✖ |
| 5 | ✔ |
| 6 | ✖ |
| 7 | ✔ |
| 8 | ✔ |
| 9 | ✖ |
| 10 | ✔ |

| Slide | Answer |
|---|---|
| 11 | ✔ |
| 12 | ✖ |
| 13 | ✖ |
| 14 | ✖ |
| 15 | ✔ |
| 16 | ✖ |
| 17 | ✔ |
| 18 | ✔ |
| 19 | ✖ |
| 20 | ✔ |

## How did you get on?

## 100% effective?


Did you see them?
AIRBUS A380
AIRBUS


?
AIRBUS A380
=
C
?

# How did you do?

**Discuss on your tables how effective is 100% inspection**

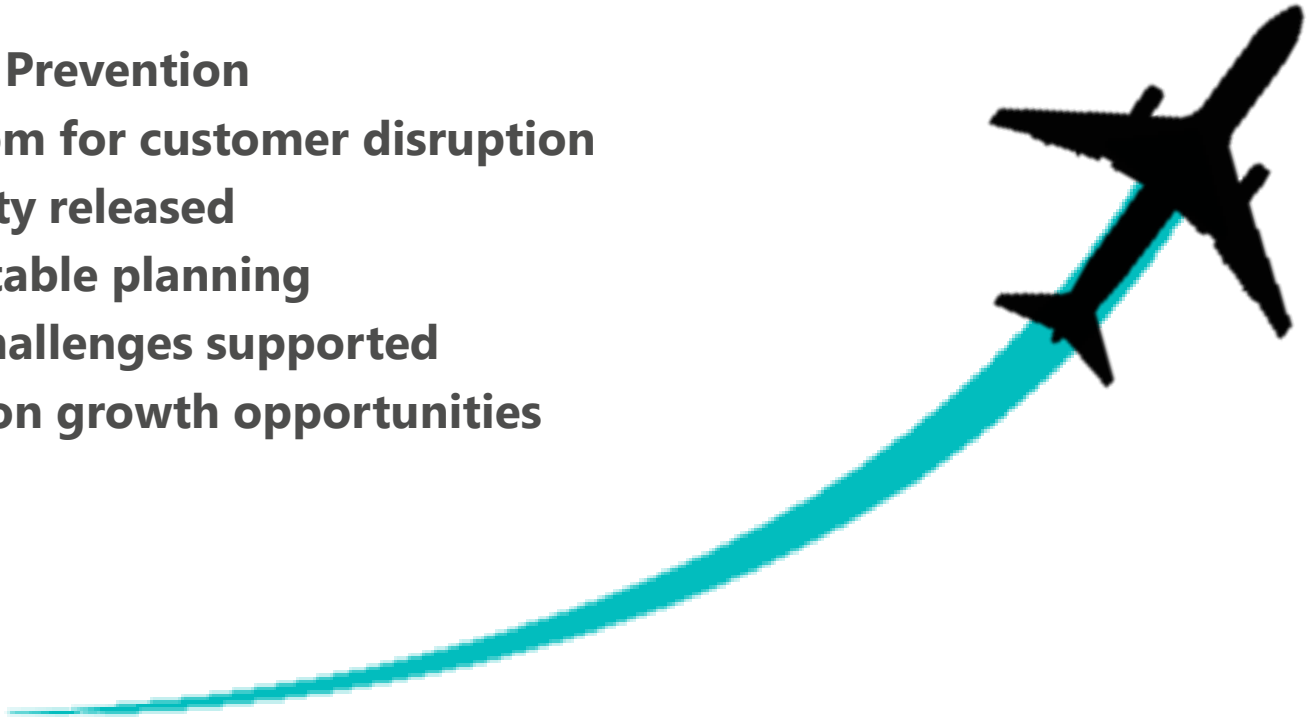
**Would 200% be better?**

**What can we do as part of defect prevention?**

**Prepare for feedback**

# Focus on Defect Prevention

**Defect Prevention**
**No room for customer disruption**
**Capacity released**
**Predictable planning**
**Cost challenges supported**
**Focus on growth opportunities**



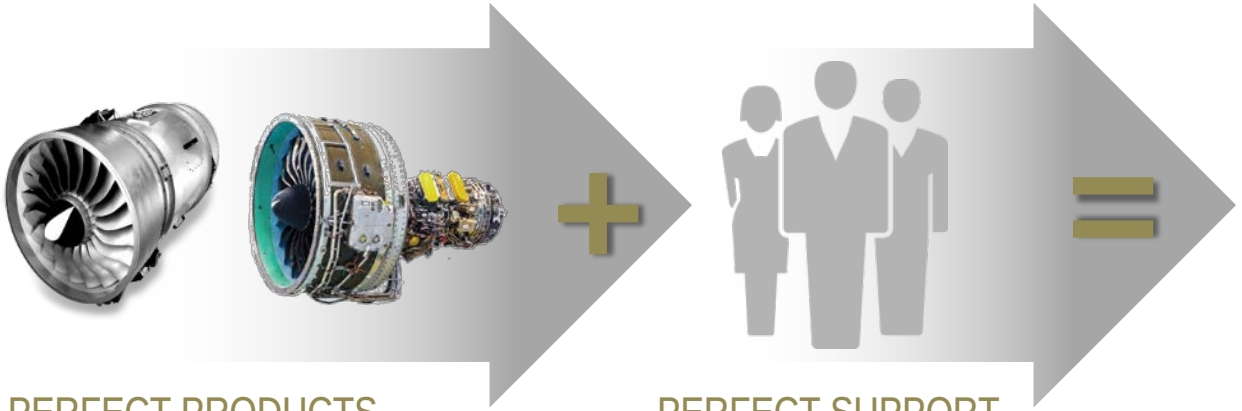
# MANUFACTURER'S PERSPECTIVE

**DELE AWOFALA**
**PRATT & WHITNEY**
**SR. DIRECTOR – SUPPLIER QUALITY**

# MEETING CUSTOMER EXPECTATIONS

**Drive and sustain superior value and a perfect customer experience**

## What we are committed to



PERFECT PRODUCTS

Living up to the dependable engine promise

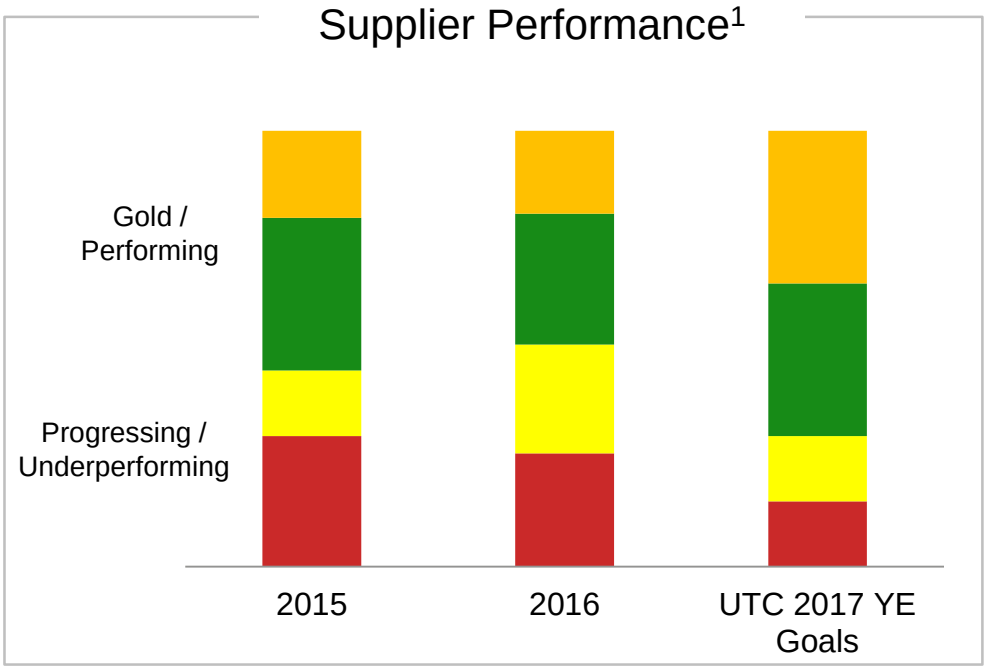
PERFECT SUPPORT

Perfect quality in all its forms

PERFECT EXPERIENCE

“Everything you need, More than you expect”

# PRATT & WHITNEY SUPPLIER GOLD




## 2020 Goal:

- 50/50 Gold & Performing

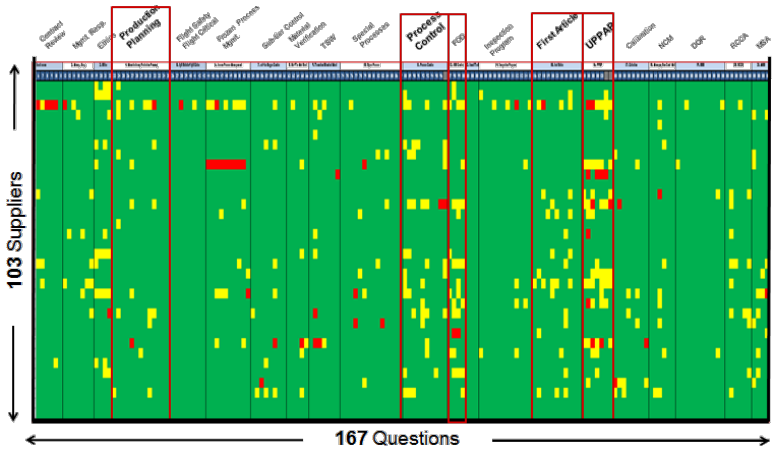
## Quality Enablers:

- Advanced Product Quality Planning (APQP)
- PPAP (Process Capability)
- PFMEA (Risk Reduction)
- Process Control \ Key Product Characteristics

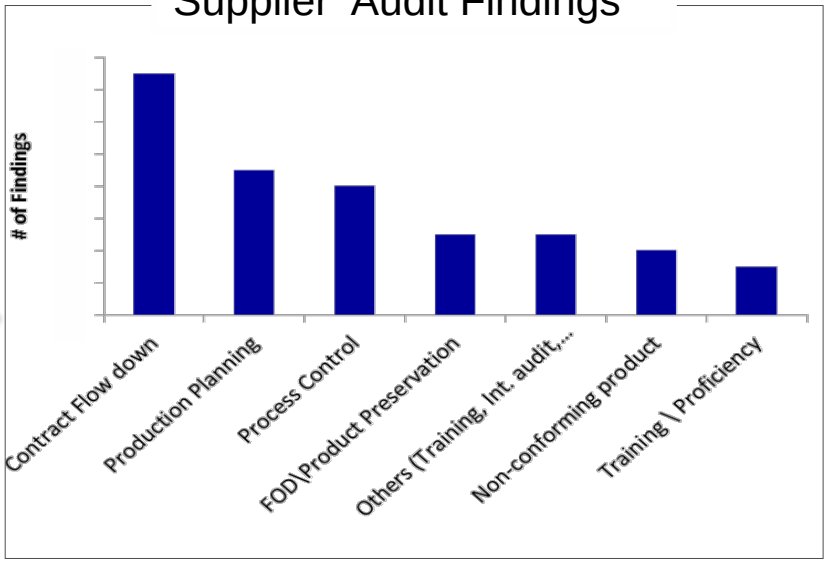
# SUPPLY CHAIN OPPORTUNITIES

## Common drivers identified

### Supplier Assessment Questionnaire



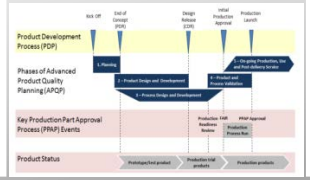

### Supplier Audit Findings



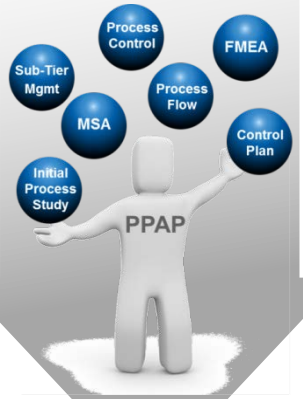

**Contract Flow down….Production Planning……PPAP…..Process Control**

# PERFECT QUALITY ENABLERS

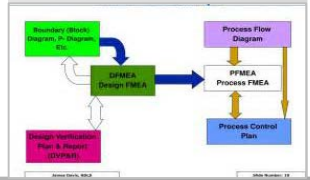
## Advanced Product Quality Planning (APQP)



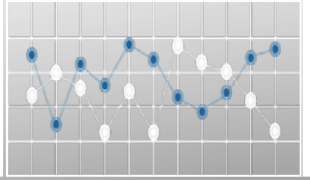

## Deploy Effective PPAP




## Drive PFMEA Process




## Leverage Process Control / KCs



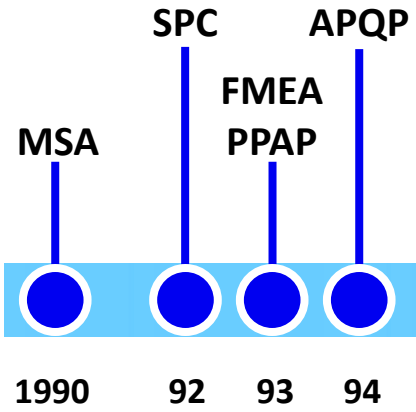
**Proactive tools to deliver to customer expectations**

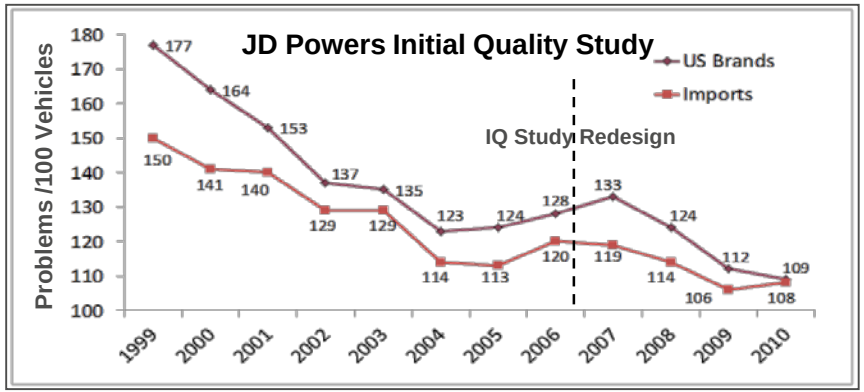
# APQP/PPAP PROCESS

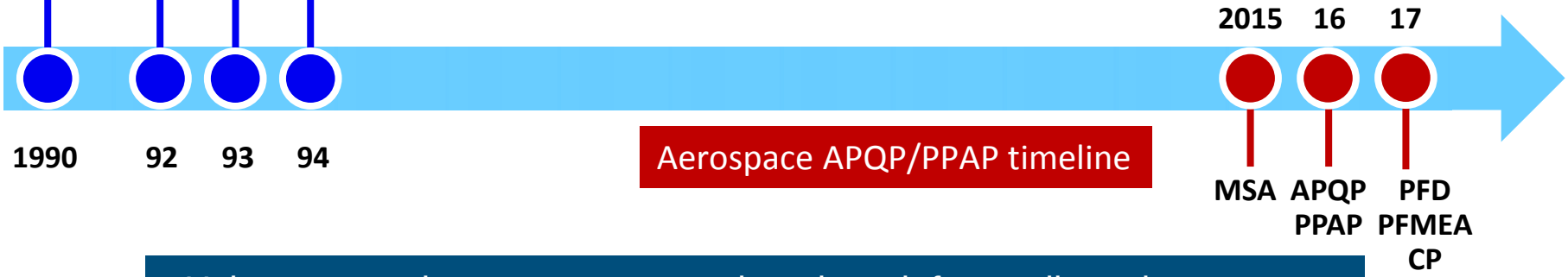
## Aligns with Aerospace Standard AS9145

AESQ STRATEGY GROUP

### Automotive "Bluebooks" APQP/PPAP timeline



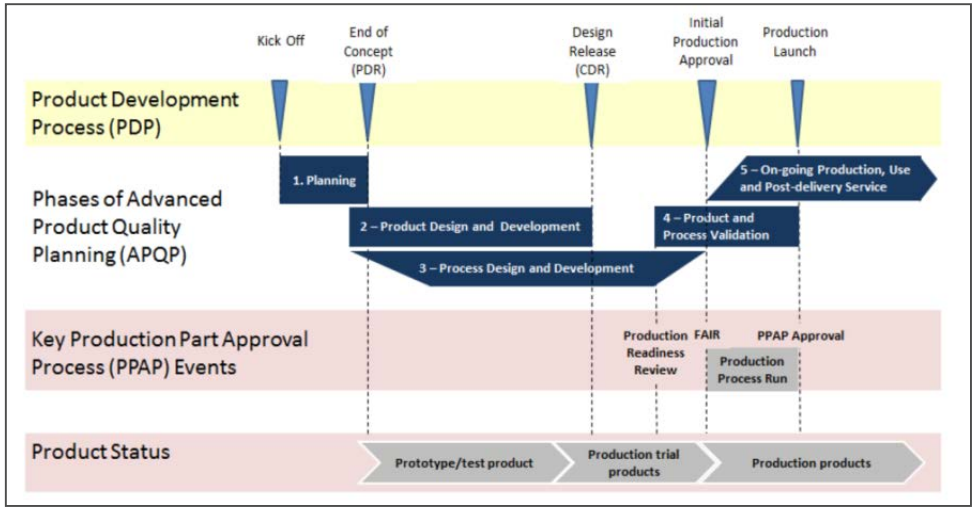




### Aerospace APQP/PPAP timeline

### Using automotive processes as a benchmark for quality enhancement

# APQP/PPAP PROCESS AND BENEFITS

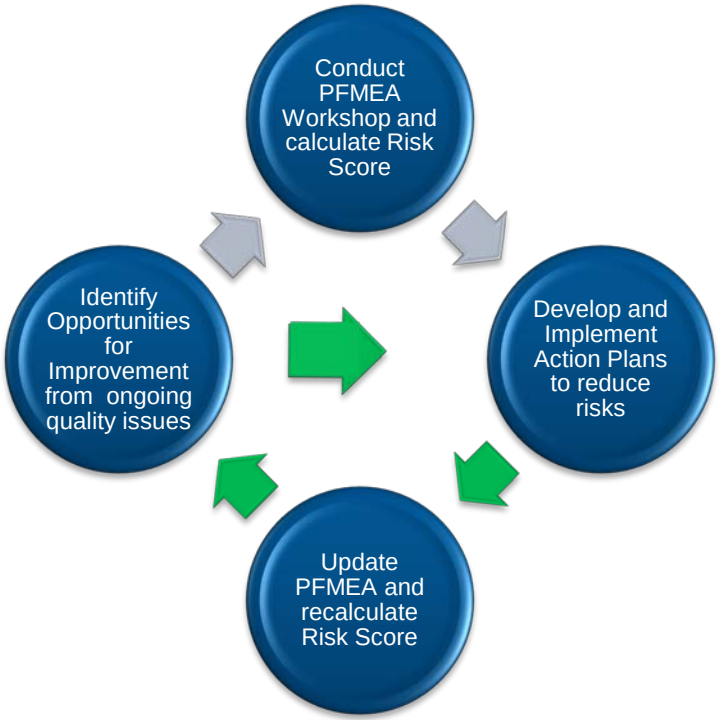


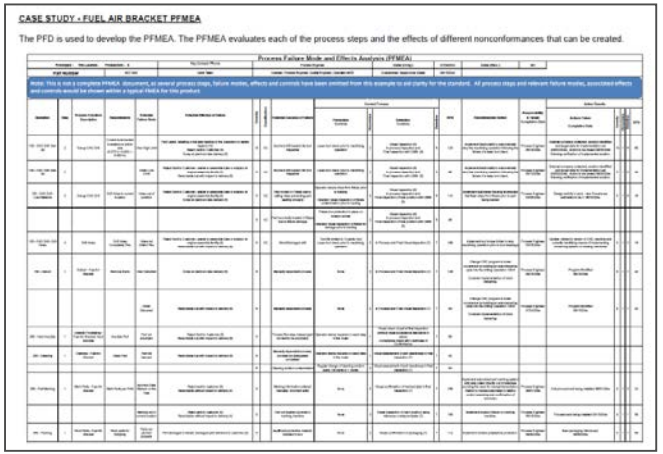

- Reduced process variation
- Short lead time to achieve rate
- Increased yield
- Reduced cost of poor quality
- Better control of process changes
- Standard PPAP package to demonstrate process control & capability

**Working upstream to prevent issues later in production**

# PFMEA – IDENTIFY AND ELIMINATE RISKS

Focus on high risk operational steps to reduce risk of manufacturing error





CASE STUDY - FUEL AIR BRACKET PFMEA

The PFD is used to develop the PFMEA. The PFMEA evaluates each of the process steps and the effects of different nonconformances that can be created.

Process Failure Mode and Effects Analysis (PFMEA)

Drive PFMEA Using
AS13004 - Process Failure Mode and Effects Analysis (PFMEA) and Control Plans

# PROCESS CONTROL AND RISK MITIGATION

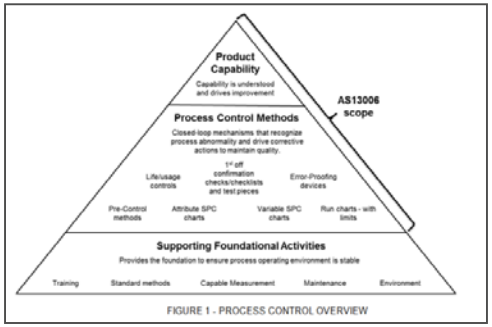


FIGURE 1 - PROCESS CONTROL OVERVIEW

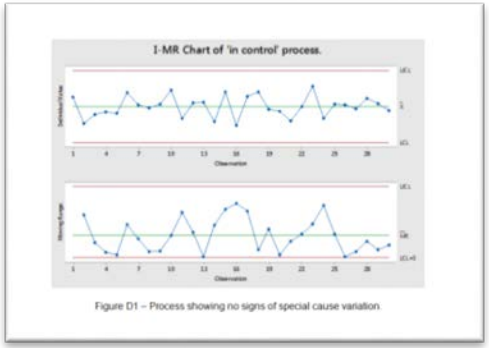


Figure D1 – Process showing no signs of special cause variation

Better variation control & reduction

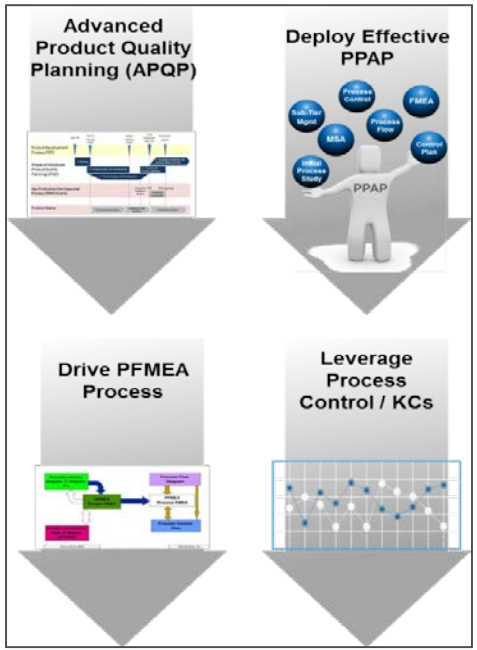
Enables fast response to process drift

Common standard aligned with AS9103, AS9145, AIAG “Blue Books” and AS13004 Process Risk Mitigation

Improved Quality Performance of Supplier selected KC’s and Customer KC’s

**The benefits far outweigh the consequences of the current state**

# REINFORCING QUALITY FIRST MINDSET




Customers expect a PERFECT EXPERIENCE

Quality must ENABLE and not inhibit

Focus on PROACTIVE tools. Not “check in the box”

Increase quality organization PROFICIENCY

Leverage AESQ Procedures and Standards

**Our common objective should be to achieve PERFECT QUALITY**

# ENGINE CERTIFICATION

# AIRWORTHINESS

SAFETY
is the main purpose of the airworthiness regulations

In official language, "safety" has a very precise meaning.

It concerns:

The SAFETY OF PERSONS TRANSPORTED.

The SAFETY OF PERSONS OVERFLOWN.

# CERTIFICATION

**CERTIFICATION covers the actions requested to the designer of an aeronautical product (aircraft, engine and propellers) that are used to demonstrate to the certifying authority (EASA*/FAA**) the safety level required for the product.**

- This demonstration includes testing of the parts, components, systems or engines, along with analyses and descriptions.

**Scope of the DESIGN CERTIFICATION, in order to establish and maintain the fleet's safety level.**

- Certification of the definition (Type Design), including after-sales documentation.
- Modifications to the Certified Definition (Definition Modifications).
- Airworthiness monitoring in service.

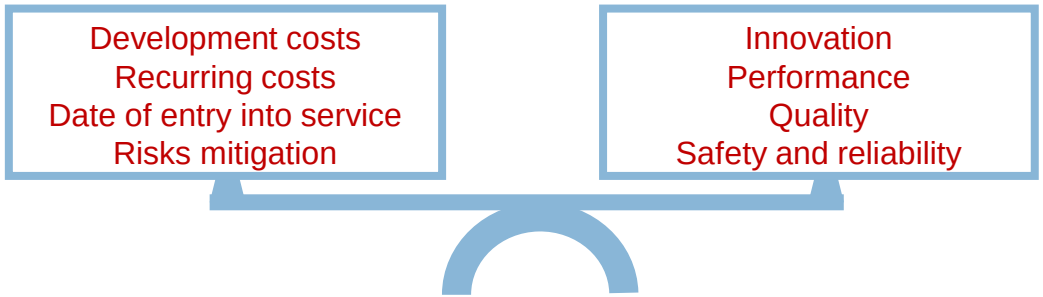
# Airworthiness: safety is non-negotiable

**Absolute prerequisite for air transport.**

**Air transport activities will double in 30 years, and safety has to be maintained accordingly or improved when possible.**

**Society is increasingly sensitive to risks…creates more pressure around safety considerations.**

**An extremely robust airworthiness regulatory structure, coordinated with industry and enforced by official agencies.**



# Summary/conclusions

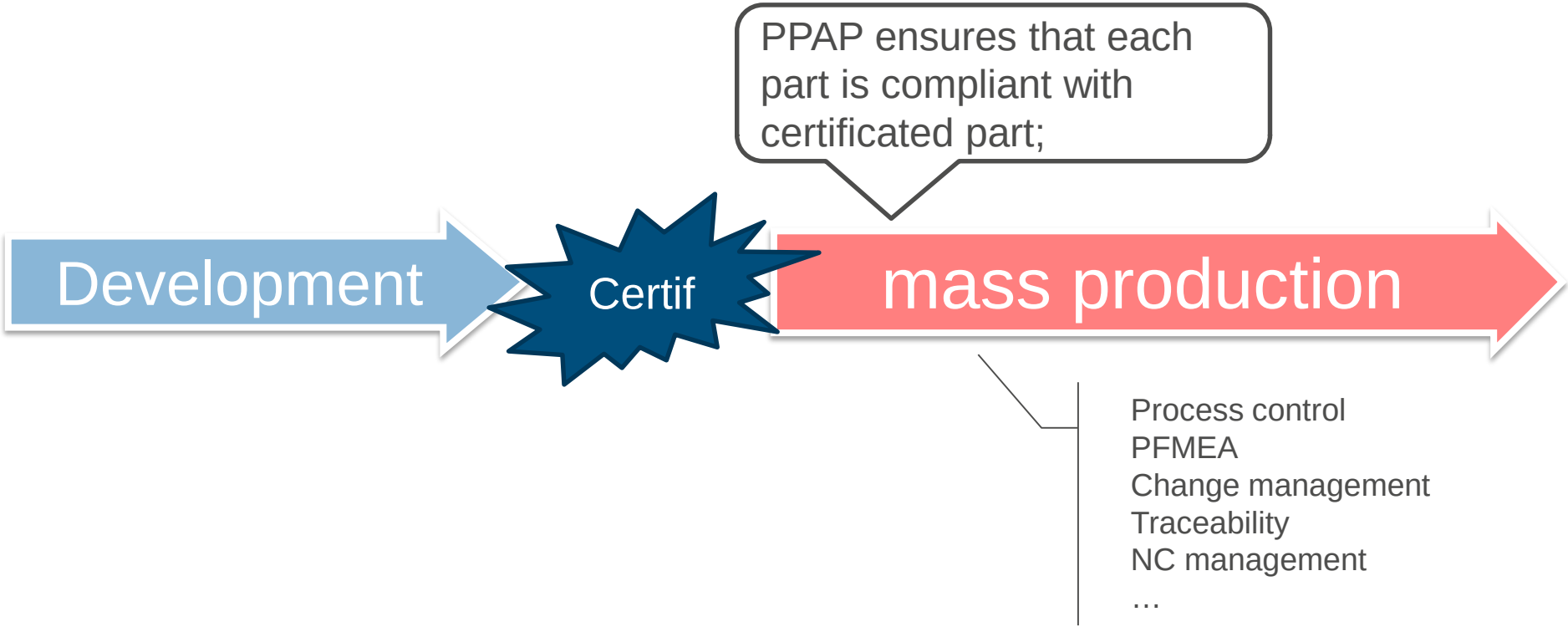
**SAFETY is the overriding goal of the certification requirements, with clearly defined levels to be respected**

**CERTIFICATION deliverables are: approved Type Design definition and Continued Airworthiness documentation.**

**The approved Type Design definition must be controlled through a Configuration Control Management, which is also approved.**

**Arrangements must be set up between the Designer and the Manufacturers in order to issue Individual Airworthiness Certificates.**

# What are the implications for us?



# STANDARDS OVERVIEW

# SAE ITC / SAE G-22 Structure

**AESQ Strategy Group**

***Companies***

Strategy

Training

Deployment

Promotion & Communication

Customer, Regulator & IAQG Interface

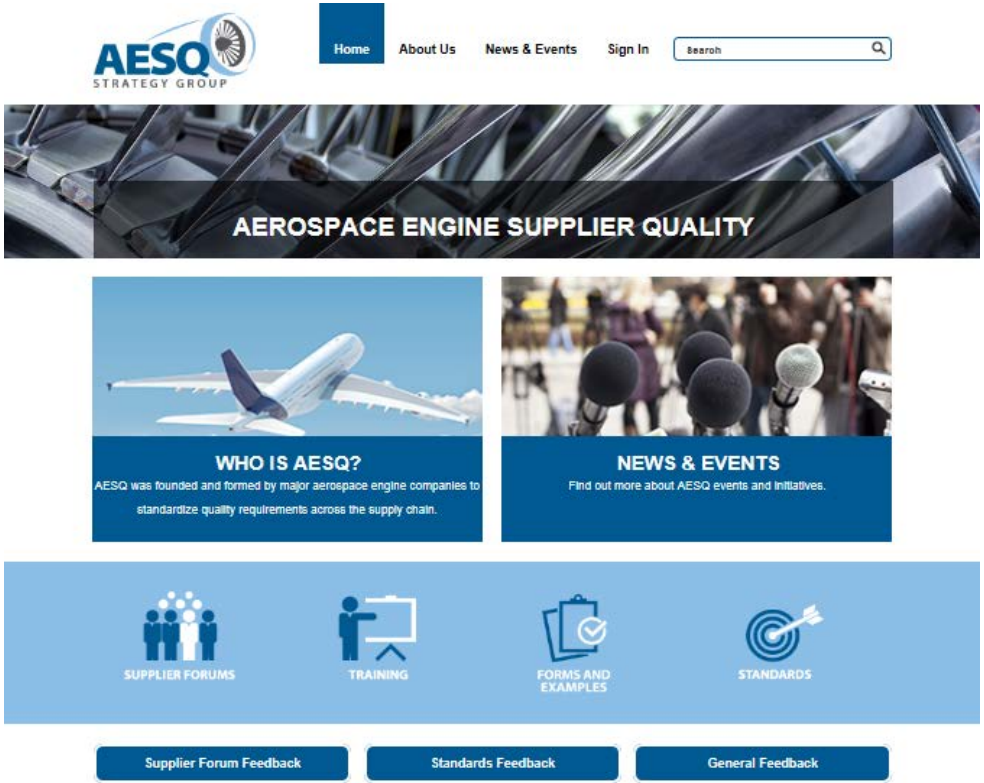
Administration

**G-22 Technical Committee**

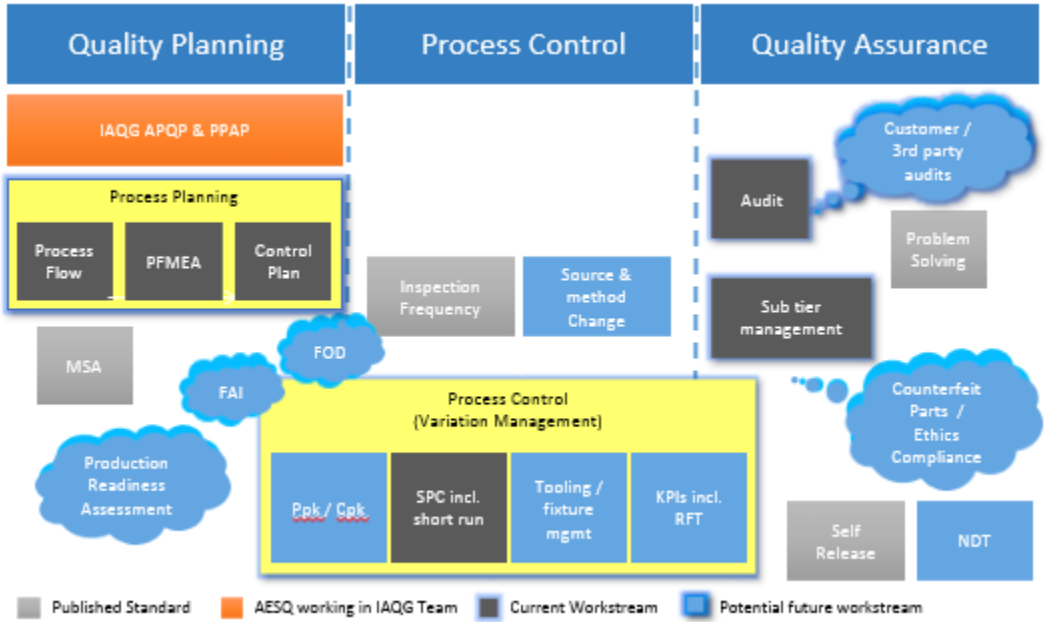
***Individuals***

Standards Writing

# AESQ Website



# Existing and Future Workstreams



# AS13000 Problem Solving

## Original State

Rolls-Royce | GE Aviation | Pratt & Whitney (A United Technologies Company) | SAFRAN

7-Step → Apollo → DIVE/Red-X® → 8D

Supplier

## Current State

GLOBAL 8D

AESQ STRATEGY GROUP

Rolls-Royce | GE Aviation | Pratt & Whitney (A United Technologies Company) | SAFRAN

8D

Supplier

## AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Reduced need for Customer training & support
- Improved access to training & consultancy
- Removal of complexity of reporting
- Improved problem solving skills

# AS13001 DPRV Training

## Original State


## Current State

- One Common Training Requirement
- Industry wide DPRV database through SAE
- Delivered by SAE Globally
- Training every 3 years


## AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards*
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Reduced costs for the supplier
- Reduced training time for DQR
- Training provided in Supplier's region
- Customer training limited to on-site

** Rev A is align with AS9117 - DPRV*

# AS13002 Inspection Frequency

## Original State

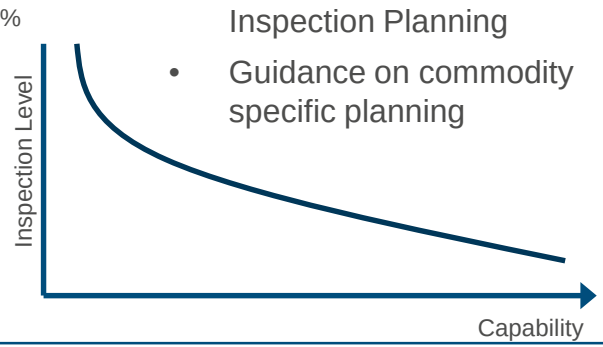
100% Inspection

REDUCED Sample

Error Proof AQL

## Current State

- Common Method for Inspection Planning
- Guidance on commodity specific planning




## AESQ Principles

- [x] Standardise
- [x] Simplify
- [ ] Adopts Existing Industry Standards
- [x] Prescriptive, Auditable
- [x] Common Language
- [ ] Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Standardised Process
- Improved compliance
- Improved Product Quality

# AS13003 Measurement System Analysis

## Original State


## Current State

| Method | Feature Category | | | |
|---|---|---|---|---|
| | Critical | Major | | |
| Resolution | ≤10% of total tolerance | | | |
| Accuracy ratio** | Requirement = 10:1 | | | |
| Accuracy Error / Bias | ≤10% of total tolerance | | | |
| Repeatability | ≤10% of total tolerance | ≤20% of total tolerance | | |
| Gauge R&R | ≤10% of total tolerance | ≤20% of total tolerance | ≤30% of total tolerance* | Purchaser requirements may override this |
| Computer driven measurement systems correlation | ≤10% of total Tolerance | | ≤20% of total Tolerance | Purchaser requirements may override this |
| Linearity** | ≤1% of total tolerance | | - | |
| Attribute Study: pass/fail | Kappa ≥ 0.8 | | - | Only required on operator dependent interpretation |
| Attribute study: ordinal | ICC ≥ 0.75 | | - | Only required on operator dependent interpretation |


## AESQ Principles

- ☑ Standardise
- ☐ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Improved knowledge of Measurement Capability
- Clarification of minimum acceptance standards
- Mandates replaces guidance
- Adopts Automotive Industry Action Group ‘Blue Book’ on MSA
- Improved Quality Performance

# AS13004 PFMEA & CONTROL PLANS

## Original State


**Varying standards and approaches**

## Future State


**In Scope:** Risk Mitigation requirements with execution guidance & recommended timing, supporting AS9145

**Out of Scope:** DFMEA requirements, any duplication of related Aerospace Standards (e.g. AS9145)

## AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Standardised process
- Increased pace of adoption
- Improved compliance to a better standard
- Reduced quality risks
- Ultimately improved quality & delivery

# AESQ Standards – Global Deployment

## Vision

Deploy harmonically

Challenge each other

Common language for Quality

Easy adoption of standards

Simplify requirements

**AESQ Standards - Global Deployment Status**

| | AS13000 Problem Solving | AS13001 DPRV Training | AS13002 Alternate Inspection Frequency Plans | AS13003 MSA | AS13004 PFMEA & Control Plans |
|---|---|---|---|---|---|
| AESQ Member | Accepted | Accepted | Accepted | Accepted | Accepted |
| Arconic (P&P) | May-15 | Feb-16 | May-17 | Mar-16 | Aug-17 |
| GE | May-14 | Oct-14 | Jan-15 | Jan-16 | Aug-17 |
| GKN | Jun-14 | Mar-15 | Apr-15 | Mar-15 | Aug-17 |
| Honeywell | Jan-16 | Mar-15 | Oct-15 | Jan-16 | Aug-17 |
| MTU | Aug-15 | Jan-16 | 4Q16 | Jan-16 | Aug-17 |
| PCC Structurals | Mar-15 | Jan-15 | May-15 | Jun-16 | 1Q 18 |
| Pratt & Whitney | Jan-15 | Mar-15 | Apr-15 | Mar-15 | Aug-17 |
| Rolls-Royce | Dec-14 | Oct-15 | Jan-15 | Jan-15 | Aug-17 |
| Safran | Jan-15 | Jan-15 | Jan-15 | Jan-15 | Aug-17 |

# Progress forward


**AESQ is now well established and is gathering momentum**

**Supplier feedback is very positive & they want us to move faster**

**Broader supplier engagement is being sought to apply more resources**

**Stronger links with IAQG & PRI are being developed**

**Stakeholder engagement essential for progress & direction**

# SURVEY

# Survey Overview

## Collaboration

- Working together to drive quality performance

## Feedback

- Provide input on developing standards

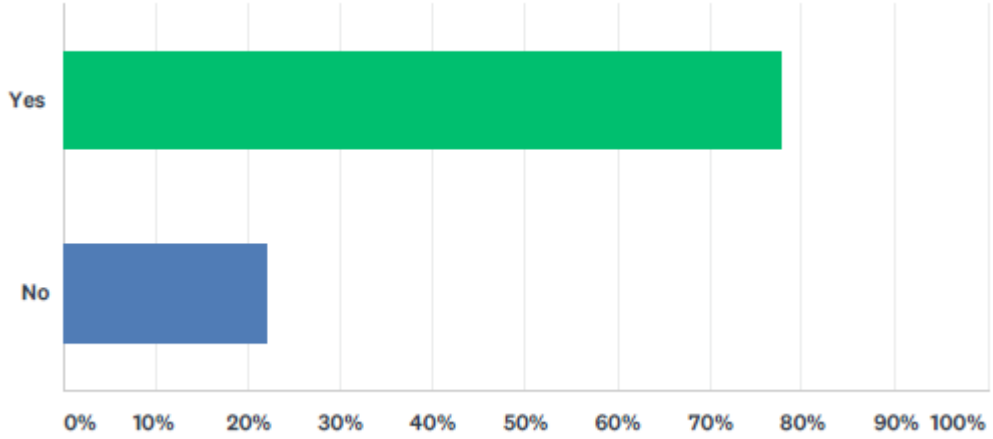
## Integrated Supply Chain

- Drive efficiency, maximize resources, create synergies

## Training

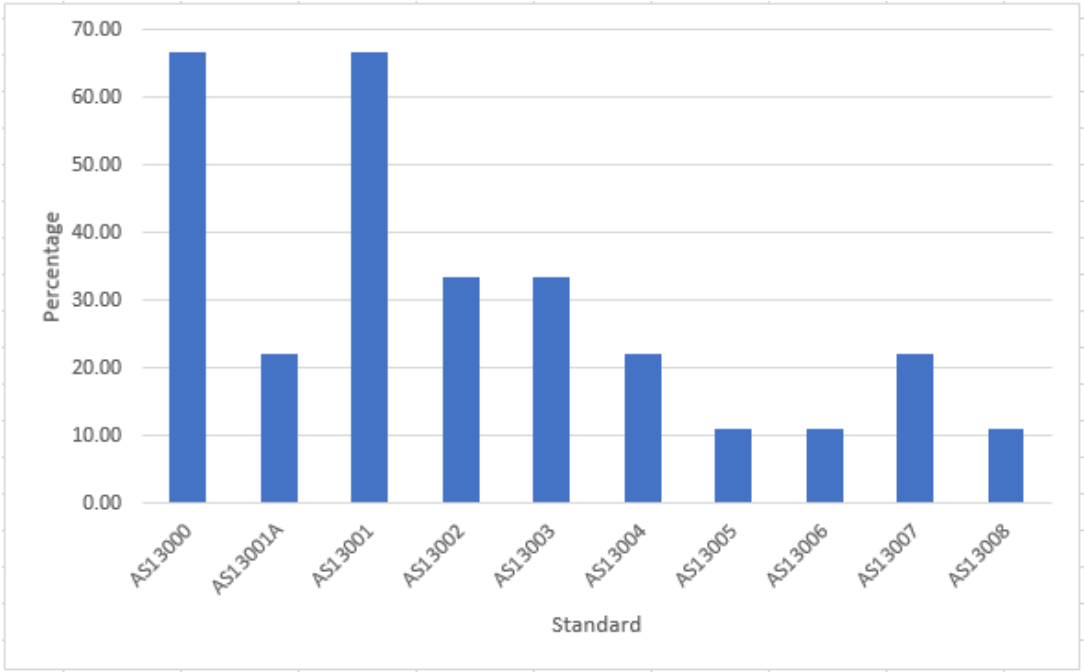
- Coordinated training efforts

# Are you aware of the Published Standards?



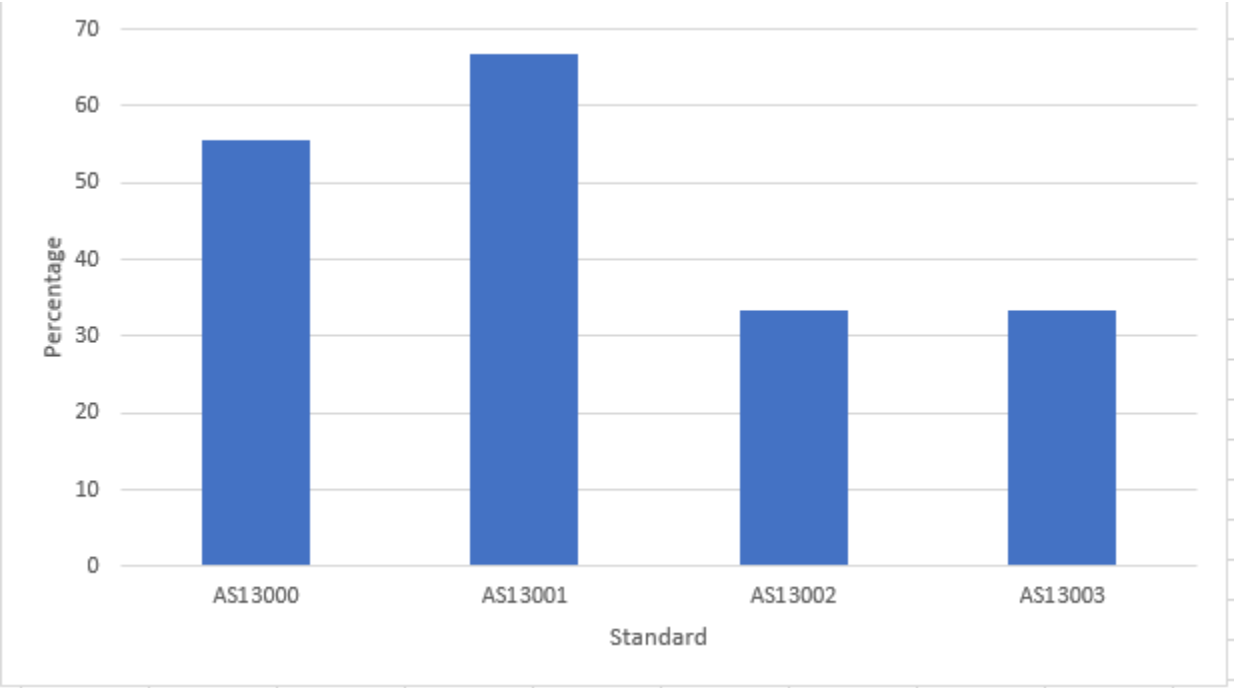

We still have some work to do

# Which Standards have you heard of?




AS13000 Problem Solving
AS13001 Supplier Self Release Training
AS13002 Inspection Frequency
AS13003 Measurement Systems Analysis
AS13004 PFMEA & Control Plans
AS13005 Internal & Supplier Audits
AS13006 Process Control
AS13007 Supplier Management

# Which Standards are in YOUR Contracts?




# MARKET PLACE #1

# Market Place #1

## 15 minutes per table

## For the published standards (5 Tables)

- 13000
- 13001
- 13002
- 13003
- 13004

# Market Place #1 Questions

1. Has the Standard been flowed down by your Customer(s)?

2. Do you have any problems with or suggestions for the Standard?

3. Have you had problems flowing down the Standard to your suppliers?

4. Are there any commodity specific considerations?

# LUNCH

# BEGIN AGAIN AT 1:15PM

# BENEFITS OF THE STANDARDS & SUPPLIER CONTRIBUTIONS TO AESQ

# AS13000 – 8D PROBLEM SOLVING REQUIREMENTS FOR SUPPLIERS

HELEN DJAKNEGREN - GKN

# AS13000 – 8D How is the Standard being used?

## PCC

- Utilized for Root Cause Corrective Action
- Incorporated with Zero Defect Program for UTAS
- Assimilated with Innovator

## MTU

- 8-D method existed for years
- Web-based IT tool in use
- Find and eliminate the “real” root cause

## GKN

- Implemented in QMS and flowed to suppliers
- Utilized in internal and external Root Cause Corrective Action

# AS13000 – 8D How is the Standard beneficial?

## PCC

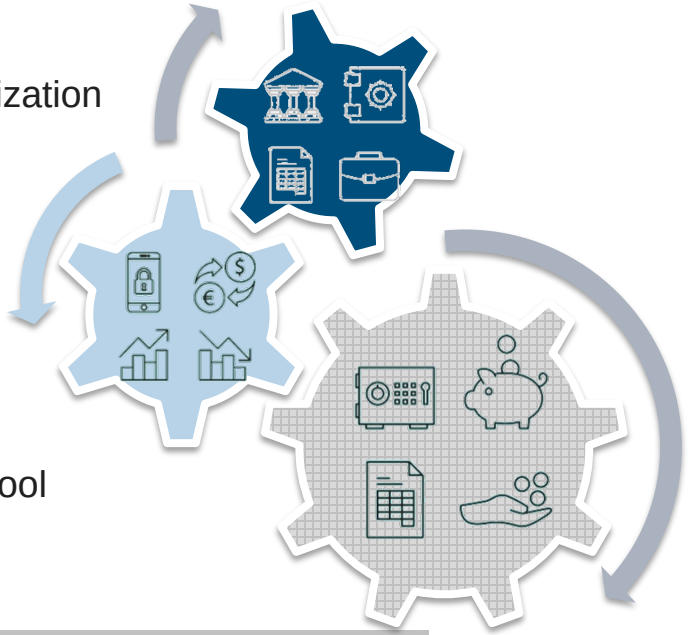
- Useful for addressing systemic issues
- Can be read-across for part families
- Increased effectiveness of problem-solving due to standardization

## MTU

- Easy to convince suppliers
- Ease of training at suppliers leading to better quality
- Increased efficiency in close-looping RCCA

## GKN

- Great problem solving method rather than just a reporting tool
- Prevented shortcuts
- Good training tool for personnel



**Supplier Development Engineer VideoVideos\AS 13000 Problem Solving.m4v**

# AS13001
# DPRV

## BHU KENJALE - PCC

# AS13001 – DPRV / DSQR How is the Standard being used?

## PCC

- Standardized training for self-release of product
- Cross-functional teams can benefit from this training

## MTU

- Implemented within MTU with high sense of urgency
- Suppliers requested implementation

## GKN

- Implemented customer release agents at GKN sites
- Implemented at suppliers for release agents

# AS13001 - How is the Standard beneficial?

## PCC

- Eliminated duplication of training at various OEMs
- Cost avoidance due to less travel and lower labor hours
- Increased shipment efficiency

## MTU

- Less travel and less training hours, for trainees and trainers. Less lost working hours for trainees
- Training done in supplier region, sometimes even in native language
- Reduced maintenance cost of different training systems for OEMs
- Standardization leads to better clarity in requirements

## GKN

- Provided a good, general overview of quality requirements
- Reduced cost associated with travel, training material and time
- Annual reduction in training hours for agents, internally and externally **Sr. Supplier Quality Engineer Video**

# AS13002 & AS13003

## MARTIN SCHAEFFNER - MTU

# AS13002 & AS13003 –How are the Standards being used?

## PCC

- For New Product Introduction
- Limited implementation

## MTU

- 13002 has limited use due to existence of already-approved quality plans
- 13003 is implemented within MTU for PPAP parts

## GKN

- 13002 has been implemented on GKN designs. This is a requirement at GKN sites, however still limited in use.
- 13003 Implementation on-going for new product introduction

# AS13002 & AS13003 - How are the Standards beneficial?

## PCC

- Standardized approach

## MTU

- MSA at MTU

## GKN

- Ease in training

# MSA@MTU

**Experiences from using the Measurement System Analysis method at MTU**

**Martin Schäffner**

10/03/2017

# Proprietary Notice

This document contains proprietary information of the MTU Aero Engines AG group companies. The document and its contents shall not be copied or disclosed to any third party or used for any purpose other than that for which it is provided, without the prior written agreement of MTU Aero Engines AG.

# General Approach

## What is the intent?

The goal is to make sure that every measurement system (gage + outside influences) used is suitable for the intended task → representing “real” part quality!
The AS13003 method summarizes different tools and delivers a standardized approach.
Mainly used in: *PPAP; approval of new measurement technology; stabilizing production processes*

## Guiding Questions

“Method 1”
*Is the gage precise and accurate enough to rely on it*?

| | |
|---|---|
| How big is the variance of my measurement? | Calculation of the value cg >1,33 |
| Is there a systematic error in the measurement? | Calculation of the value cgk >1,33 |

“Method 2”
*What happens in real production line conditions?*

| | |
|---|---|
| What happens if the same inspector measures the same part without knowing the results from his last measurements? | % GR&R Total Variance |
| What happens when a different inspector measures the same part without knowing the results from his coworker? | |

# Hands-on Example

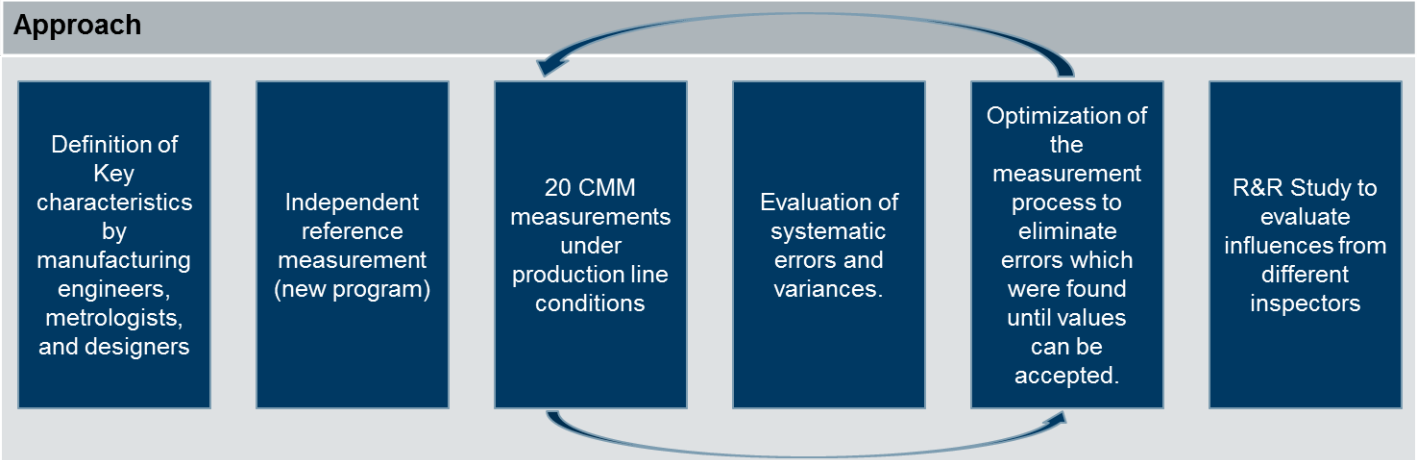
## Case, Turbine

### Backround

- Thin-walled part with tight tolerances
- The measurement results were suspected to be unstable due to issues with the fixture and clamps.

→ MSA performed according to AS13003

### Approach



# Actions defined due to results from the MSA

Case, Turbine

- characteristics showed problems with accuracy and repeatability

  **→ a test on a more accurate CMM showed a huge improvement**

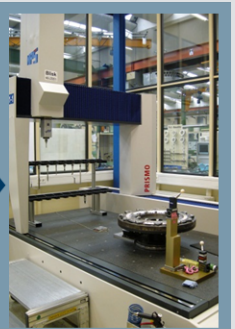
- form tolerances problems with repeatability even though the machine was changed

  **→ The cause was found in changing the measuring fixture**

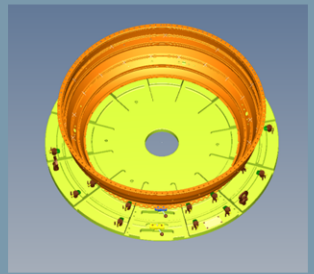
- The parallelism tolerance between the upper and lower flange was still not in

  **→ Together with engineering the reference plane was changed**

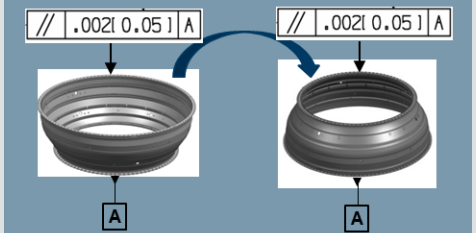
Standard CMM for this part family



New CMM



Rework of the measuring fixture




Change made to the drawing

## Lessons Learned up to now

- By using the MSA method you get a reliable and understandable statement if you can rely on your results or not
  → don't touch your production processes before you are sure about your measurement
- Cg & Cgk database is a great support to discuss drawing requirements with the design organization
- An MSA helps to eliminate influences coming from different measurement strategies
- A CMM measurement is not always reliable – accuracy and inspector variance matters
- High quality of existing measurement programs as in most cases only a few characteristics show a significant variance
- A comparison to an independent reference measurement gives a valuable insight into the production line measurement;
  → not easy to achieve due to the small tolerances and the expectation to be more precise
- For tighter tolerances the method is very challenging and even a difference of 1/10 µm between reference & production results can be the reason for an incapable system -> Rules for these special cases are necessary

# SUPPLIER CONTRIBUTIONS TO AESQ WORK

# Supplier Contributions

## How can suppliers contribute to the work of AESQ?

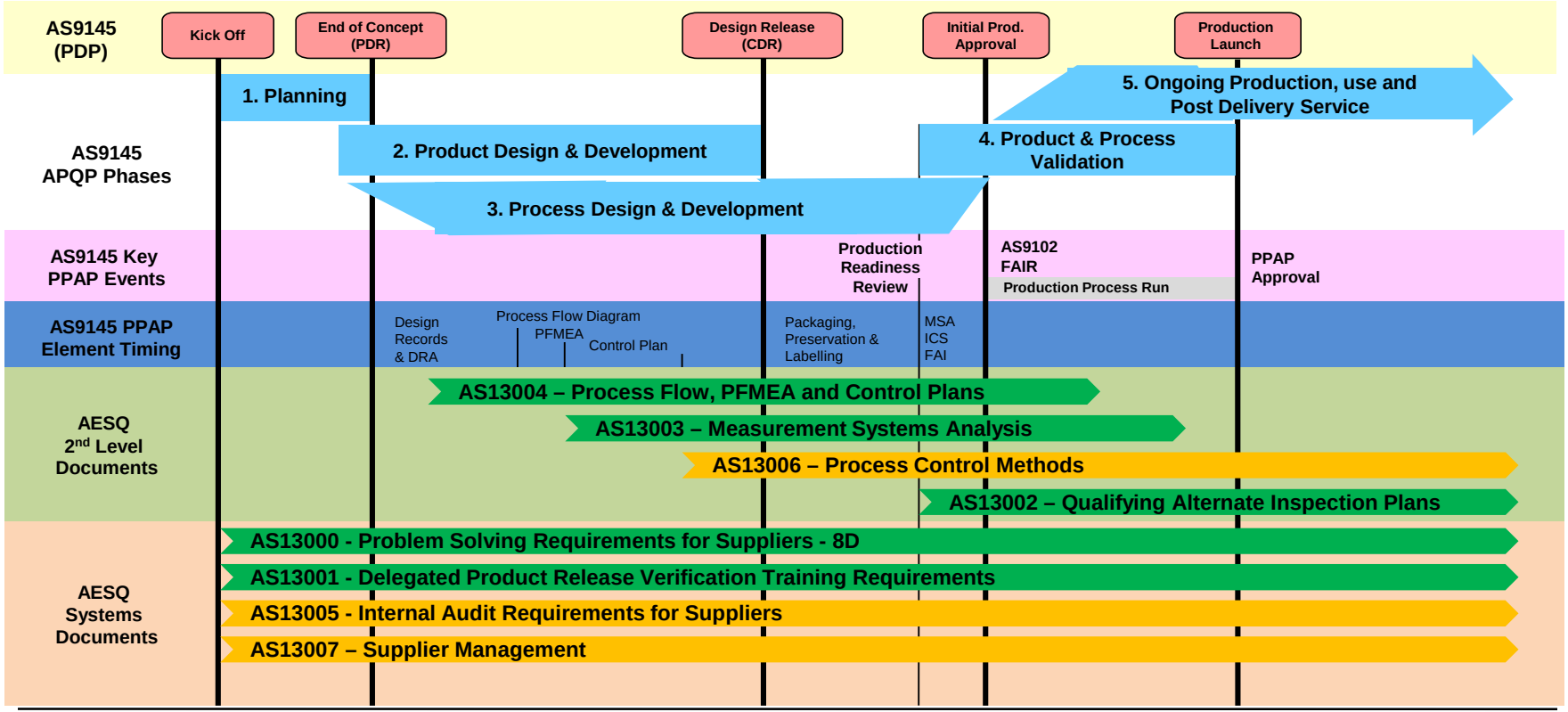
- Attend AESQ supplier forums
- Provide feedback on current and future standards through the website
- If you see a valuable need to standardize between AESQ members, please communicate
- Share experiences/case studies of best practices and impact of standards
- Claim your rights and privileges from the AS1300X standards vis-à-vis your customer. AESQ members  are committed to deploy

How to give feedback

# OVERVIEW OF DRAFT STANDARDS

# Product Life Cycle & Document Interaction

## AS9145 (APQP/PPAP) & AESQ Standards



# AS13006 Process Control

## Original State

**Varying standards & approaches**

- PC requirements not clearly defined/understood
- Inconsistent application/flowdown to sub-tiers
- Lack of commitment/belief in benefits
- Belief low volume environments not applicable

## Future State

**Common standard & approach Aligned with AS13002, 13003, 13004, AS9103, AS9145 & AIAG "Blue Books"**

**In scope:** Process Control for all characteristics
**Out of scope:** Foundational requirements

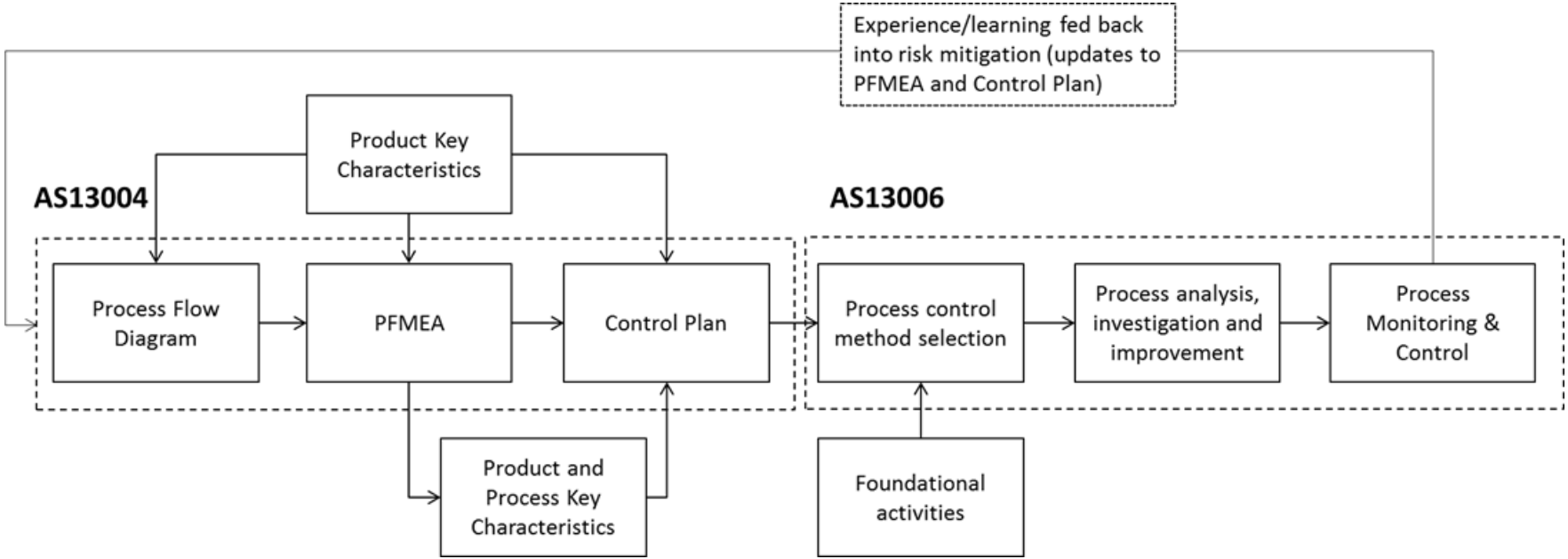
## AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Improved variation control & reduction techniques, broad-based belief in benefits
- Common prescriptive standard fully aligned with AESQ, AS9103 & AIAG Blue Book Stds
- Focus on accurate data analysis and prevention
- Improved Quality Performance, reduced risk
- Help will be on the website and not in the standard

# AS13006 Process Control – Valuable Content



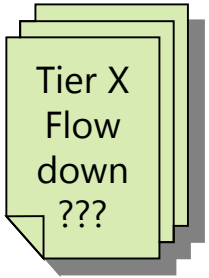
# AS13007 Supplier Management

- **Lots of sub-tier surprises?**
- **Is the variation and risk understood?**
- **Is the risk owned?**
- **Is it managed?**
- **Why and how will you improve it?**

# AS13007 Supplier Management

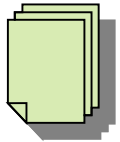
**Original State**


**Varied Customer-Specific Requirements**




**Future State**


**Fewer Customer-Specific Requirements**



**In scope:** Raw material & finished hardware
**Out of scope:** Distributors & MRO suppliers

## AESQ Principles

- [x] Standardise
- [x] Simplify
- [x] Adopts Existing Industry Standards
- [x] Prescriptive, Auditable
- [x] Common Language
- [ ] Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Simplify language for organizations to manage suppliers
- Ability to use the standard throughout all tiers of the supply chain
- Standard will simplify and reduce the number of methods the suppliers must use to meet Customer requirements (i.e. simplify/make common the "how to")
- Better quality from sub-tiers

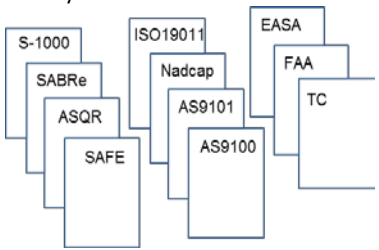
# AS13007 Supplier Management - Requirements

- 4.3 Quality System Requirements
- 4.5 Supplier Evaluation
- 4.6 Supplier Selection and Approval
- 4.7 Purchasing Requirements
- 4.8 Verification of Purchased Product
- 4.9 Control Of Suppliers
- 4.10 Supplier Performance Monitoring
- 4.11 Supplier Surveillance
- 4.13 Corrective and Preventive Action
- 4.14 Management of Nonconformance
- 4.15 Records

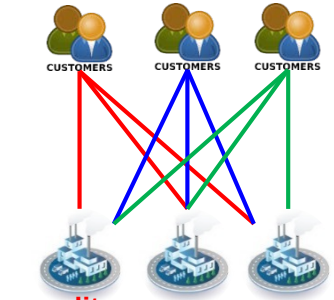
# AS13005 Internal & Supplier Surveillance Quality Audit Requirements

## Original State

Internal audit requirements in many documents




Every Customer…




…audits…

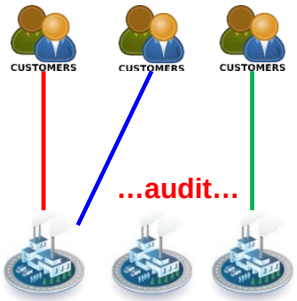
…every Supplier

## Future State

**Aerospace Standard AS13005**

- Audit types & checklists
  - System
  - Production process
  - Product
  - Special process
- Auditor qualification, KPI´s
- Supplier Surveillance Audit
  - Selecting suppliers
  - Selecting scope, approach
- Audit outcome

Customers use standard audit process to…




…audit…

…appropriate Suppliers

## AESQ Principles

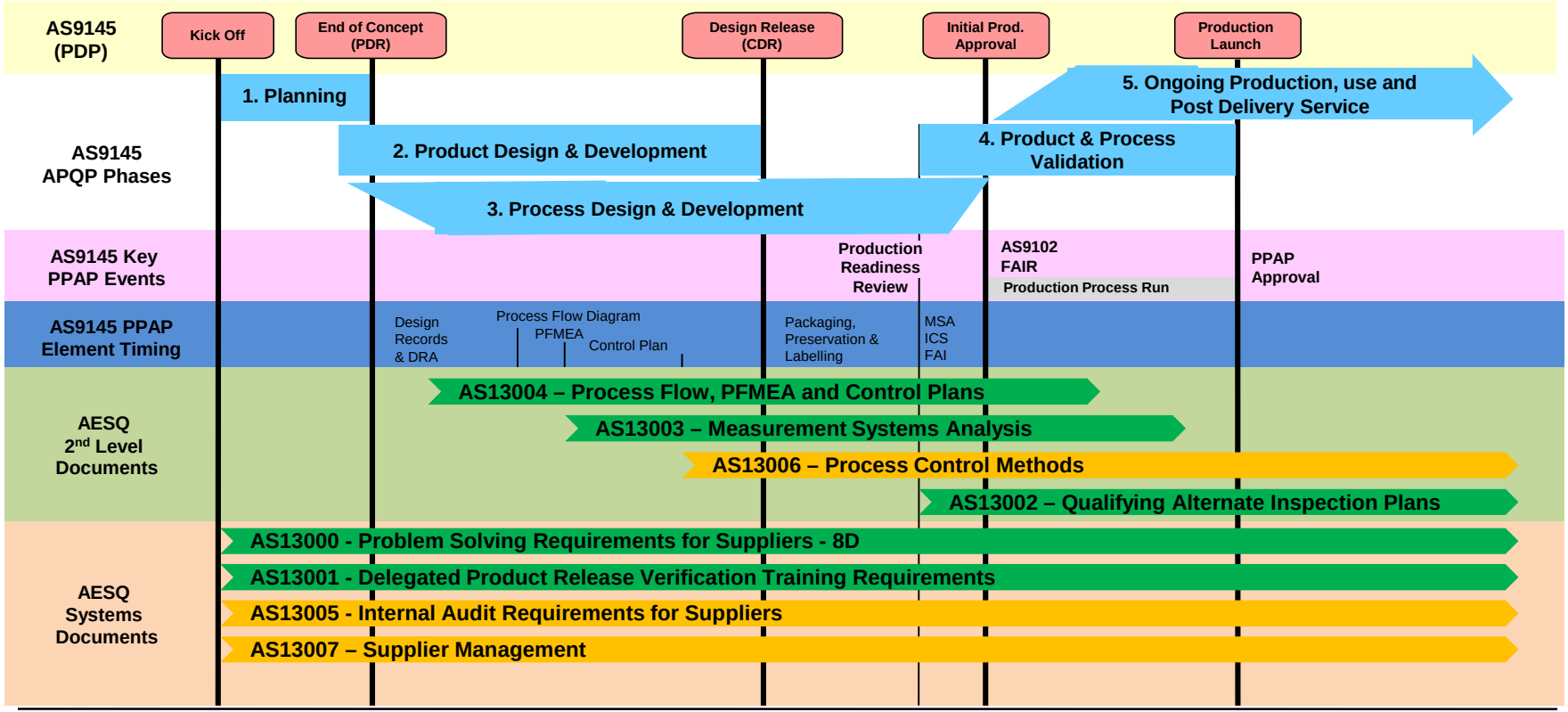
- [x] Standardise
- [x] Simplify
- [x] Adopts Existing Industry Standards
- [x] Prescriptive, Auditable
- [x] Common Language
- [ ] Supported by 3rd Party Training & Consultancy

## Expected Benefits

- Lean & effective internal audit process provides confidence in state of compliance throughout Aero-Engine supply chain
- Improved rigor of audit approach
- Suppliers chosen for audit based on performance and risk
- Reduced and/or eliminated unnecessary and/or duplicate audits => Cost reduction / resources liberated by customer and supplier.
- Reduced supplier audits for performing suppliers (low risk) that demonstrate compliance to internal audit requirements
- Recognizes existing 3rd party certification

# Product Life Cycle & Document Interaction

## AS9145 (APQP/PPAP) & AESQ Standards



# MARKET PLACE #2

# Market Place #2

## 15 minutes per table

## For the Work In Progress standards (4 Tables)

- 13005
- 13006
- 13007
- Future

# Market Place Questions

Are there any additional questions, concerns, or feedback?

# BREAK & QUIZ

# QUIZ ANSWERS

1. What does AESQ stand for?
   a.) Aeronautical Engine Source Quality
   b.) Aerospace Engineering Supplier Quality
   **c.) Aerospace Engine Supplier Quality**
   d.) Aeronautical Engineering Source Quality
   e.) Aerospace Equipment Standards for Quality

2. Airworthiness regulations require safety be maintained for;
   a.) The crew and passengers of manned aircraft
   b.) Persons being overflown
   c.) Property on the ground
   **d.) All of the above**
   e.) a.) and b.) only

3. How can an organization request approval for an alternate inspection frequency plan as per AS13002?
   a.) Request your quality contact to allow its use.
   **b.) Utilize the example form available at aesq.saeitc.org to provide proof of capability and control.**
   c.) Just change and see if the customer catches you.
   d.) Perform capability studies and develop a strategy to reduce.
   e.) None of the above

4. In general, what are the AS13000 requirements for timely problem solving response to customers?
   a.) D0 completed and returned to the customer within 2 days of problem identification.
   b.) D5 completed and communicated to the customer within 30 days of problem identification.
   c.) D8 closed and documentation sent to the customer within 60 days of problem identification.
   d.) All of the above
   **e.) a.) and c.) only**

5. In which following situation(s) should an MSA be performed/reevaluated when applying AS13003?
   a.) New/Changed Production Process.
   b.) Product requirements are changed to be more restrictive or tightened.
   c.) To verify a measurement system is adequate before SPC.
   d.) Following a product escape related to (or suspected to be) from the Measurement System
   **e.) All of the above.**

6. AS13004 should be applied to:
   a.) All New Product Introduction parts only
   b.) Products and/or services currently in production only.
   **c.) New Product Introduction and products currently in production when manufacturing processes are changed, transferred to a new location, or addressed for improvement.**
   d.) Only when a customer makes a request.
   e.) None of the above

7. If AS13001 is a customer requirement, where can DPRV personnel apply for training?
   a.) AESQ Website
   b.) SAE Website
   **c.) Probitas Authentication Website**
   d.) Through their customer
   e.) All of the above

# MARKET PLACE SUMMARY

# Marketplace Summary Session 1

| Standard | Key Feedback | Facilitators |
|---|---|---|
| General | Will suppliers really see unique requirement elimination or will these standards drive additional work?<br>How is AESQ applying this standard to tooling “non-product” supplier/products | |
| AS13000 | Recommend consistent 8D training | Olivier Castets |
| AS13001 | Inconsistency of customer expectations<br>Missing commodities, engines and non flying parts | Earl Capozzi |
| AS13002 | Partner with AS9100 Auditors<br>Execute training deployment | Dave Goldberg |
| AS13003 | Flow down as a reference in some cases, not clearly listed.<br>Customers sometimes request MSA on all gauges, not practical, should be NPI KC or KC-M. | Dele Awofala<br>Martin Schaeffner |
| AS13004 | Still new | John Calder |

# Marketplace Summary Session 2

| Standard | Key Feedback | Facilitators |
|---|---|---|
| AS13005 | Like to see a common audit approach | Jeremy Johnson<br>Helen Djaknegren |
| AS13006 | What is the clear business case to conduct it? | Peter Amsden |
| AS13007 | Similarity to AS9100 – more definition<br>Applicability to all components | Robert Czanik<br>Thomas Schmitt |
| Future | First Article Integration<br>Change Management<br>Standardize concession<br>Can AESQ website provide notifications upon new AESQ standards? | Catherine Catarina-Graca<br>Bhu Kenjale |

# CLOSING REMARKS

# AESQ Vision

**“To establish and maintain a common set of Quality Requirements that enable the Global Aero Engine Supply Chain to be truly competitive through lean, capable processes and a culture of Continuous Improvement.”**

**In detail:**

- create common standards within the engine manufacturers (OEM’s) in regard to quality
- deploy together the written standards throughout our supply chain
- establish capable quality processes and a culture of continuous improvement

**Main Targets:**

- to improve quality within the supply chain
- improve on time delivery and minimize costs through a reliable quality performance
- Gain efficiency by standardized processes

# AESQ will drive progress

AESQ STRATEGY GROUP

# Spread the word

# We mean it!

ARCONIC

GE Aviation

Pratt & Whitney
A United Technologies Company

SAFRAN

PCC Structurals, Inc.

Rolls-Royce

Honeywell

MTU Aero Engines

GKN AEROSPACE