WELCOME

AESQ SUPPLIER FORUM

11 April 2018

Trollhättan, Sweden

LOGISTICS

HELEN DJÄKNEGREN
GKN AEROSPACE

Logistics

WELCOME

JOAKIM ANDERSSON
CEO, GKN AEROSPACE ENGINE SYSTEM

Welcome to AESQ Supplier Forum

hosted by

GKN Aerospace Engine Systems

GKN AEROSPACE

MAKING THINGS FLY

LÄTT ATT GÖRA RÄTT

Simple input

Enabler – Standards – MAKE IT HAPPEN

“Make Operation Boring”

Agenda

8:15 **Welcome to GKN and AESQ -** Helen Djäknegren, GKN

8:35 **Introduction to AESQ -** Martin Schaeffner, MTU

9:00 **Voice of the Customer -** Emile Colongo, Airbus

9:45 **Supplier Survey Results -** Olivier Castets, Safran

10:00 **Break**

10:30 **Overview of AESQ Standards -** Olivier Castets, Safran

11:00 **Marketplace #1 - Published Standards -** Barrie Hicklin, Honeywell

12:00 **Lunch**

Agenda

1:00 **Benefits of AS13001 DPRV Training Requirements -** Catherine Catarina-Graça, Safran

1:20 **Benefits of AS13003 MSA -** Martin Schaeffner, MTU

1:40 **Benefits of AS13004 PFMEA & Control Plans -** Ian Riggs, Rolls-Royce

2:10 **Future Initiatives -** Peter Amsden, Pratt & Whitney

2:30 **Break**

3:00 **Marketplace #2 - Current Projects & Future Initiatives -** Barrie Hicklin, Honeywell

4:10 **Marketplace Summary -** Barrie Hicklin, Honeywell

4:25 **Closing remarks -** Helen Djäknegren, GKN and Martin Schaeffner, MTU

Facilitators in the Room

Introduce Yourself

1. Take the Attendee Name Sheet from your table
2. Introduce yourself to as many people as possible in 5 minutes
3. Share your name, position, company and how far you have travelled to be here today
4. By the time you go home today we hope you can complete the whole sheet.

Code of Conduct

- 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

INTRODUCTION TO THE AESQ

MARTIN SCHAEFFNER, MTU

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

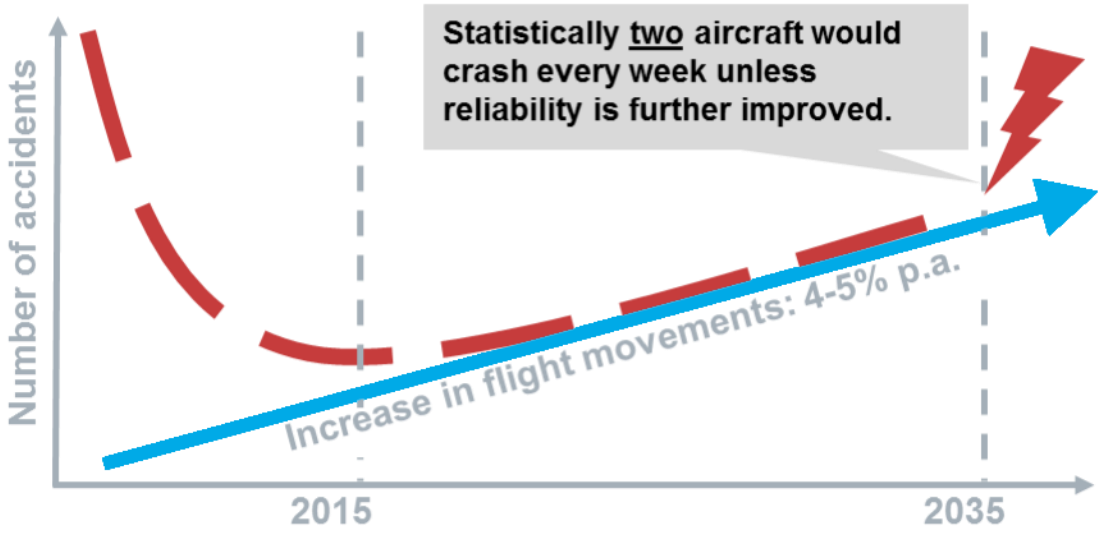
23,000 active aircraft in 2016

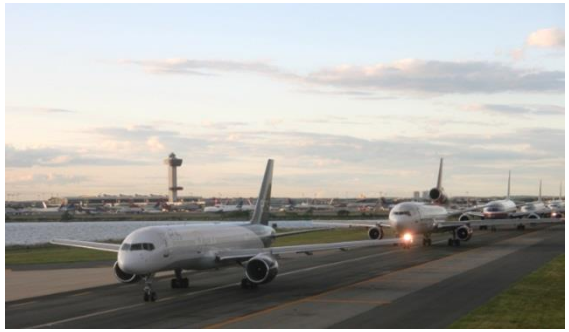
45,000 active aircraft in 2036

Quelle: Ascend, IATA, MTU

Aviation Safety

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



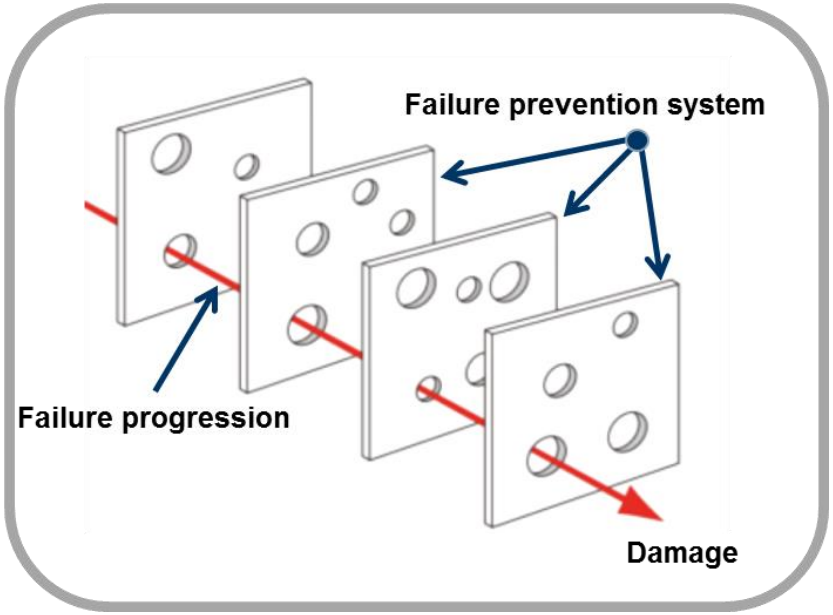


Chain of Events

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

It is a sequence of events involving

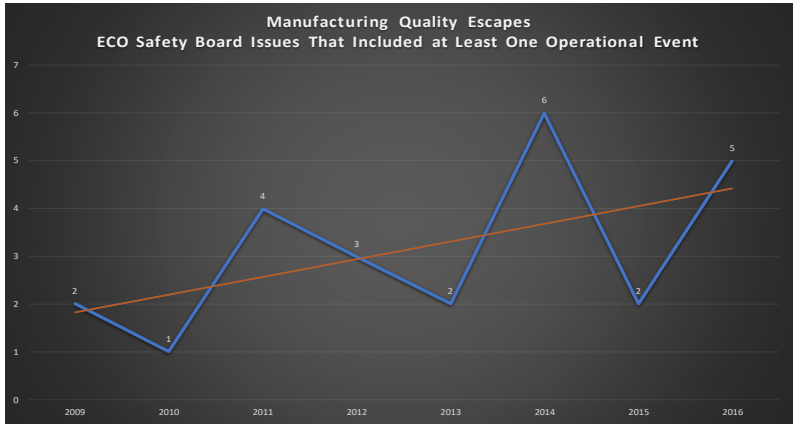
- hidden (latent) failures
- errors of judgment/action
- a failure of the failure prevention systems



Manufacturing Quality Escapes in Turbine Engines

-->An FAA proposal for further investigation and action – January 2018

- The trend of manufacturing quality escape safety board issues that resulted in at least one operational event has been increasing.
- The percentage of total turbofan ADs associated with manufacturing quality escapes has been cyclic since 2004, but 2016 (37%) was the highest percentage in the prior four years, and second only to 2011 (44%).
- The top drivers in turbofan manufacturing quality escape ADs were related to issues with surface finish, incorrect dimensions, and forging (all with 8), followed by incorrect assembly (7).
- Life limited parts (32) made up the vast majority of the turbofan manufacturing quality escape ADs, more than three times the next closest part type.



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

AESQ Vision

In detail

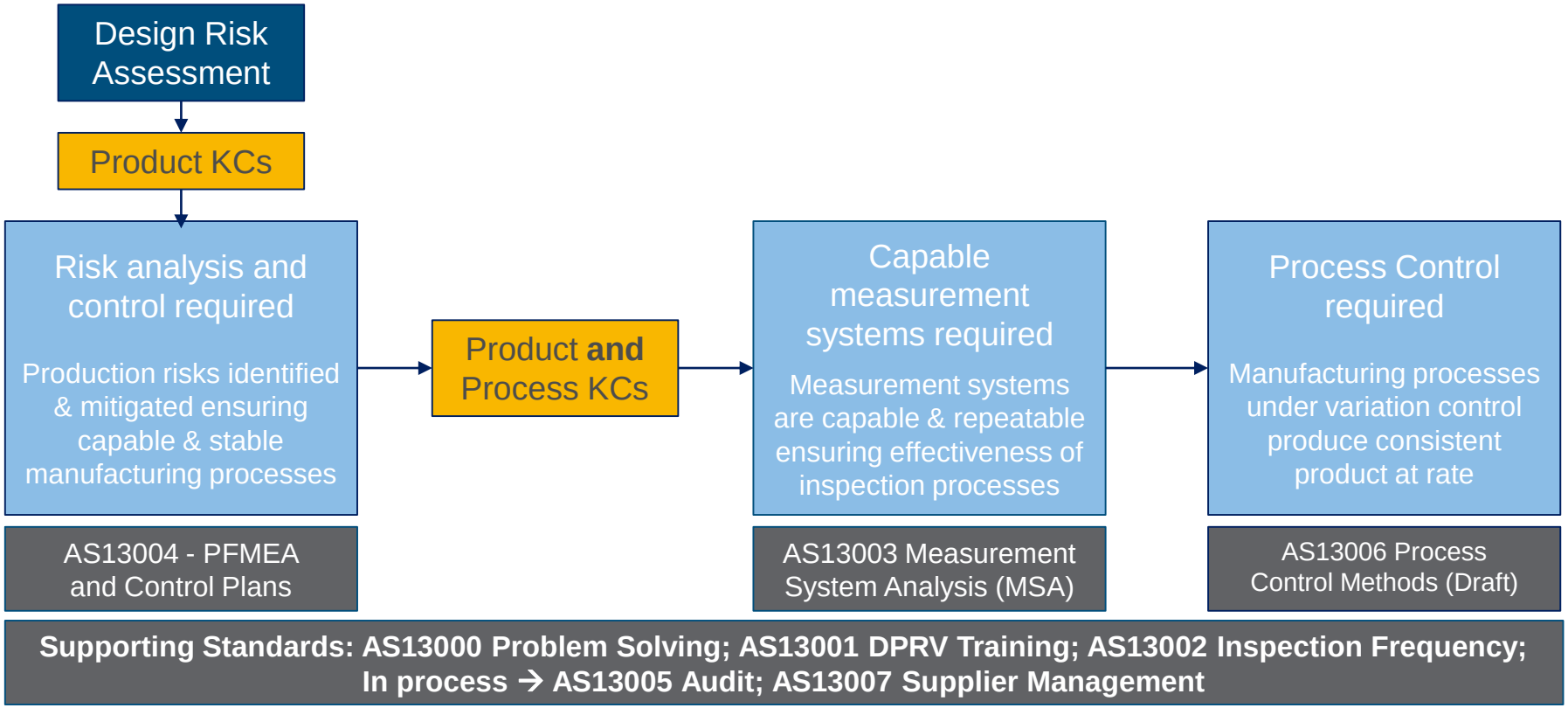
- Create common standards within the engine manufacturers (OEM's) in regard to quality
- Deploy together the written standards throughout our supply chain
- Establish capable quality processes and a culture of continuous improvement

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 Key Quality Elements

→ Aligned to AS9145 APQP & PPAP



AESQ Will Drive Progress

- AS13000, AS13001, AS13002, AS13003, AS13004 are all flowed down by all AESQ members and part of **your** Purchase Order

VOICE OF THE CUSTOMER

EMILE COLONGO, AIRBUS

SUPPLIER SURVEY RESULTS

OLIVIER CASTETS, SAFRAN

Supplier Survey Overview

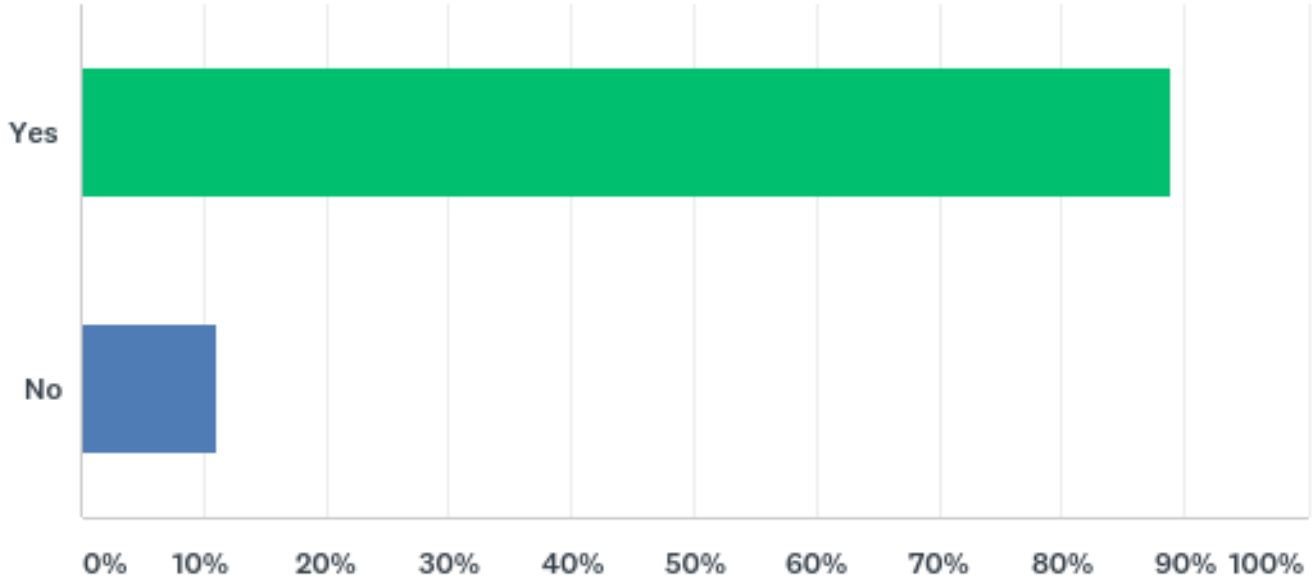
Collaboration
- Working together to drive quality performance

Feedback
- Provide input on developing standards

Integrated Supply Chain
- Drive efficiency, maximize resources, create synergies

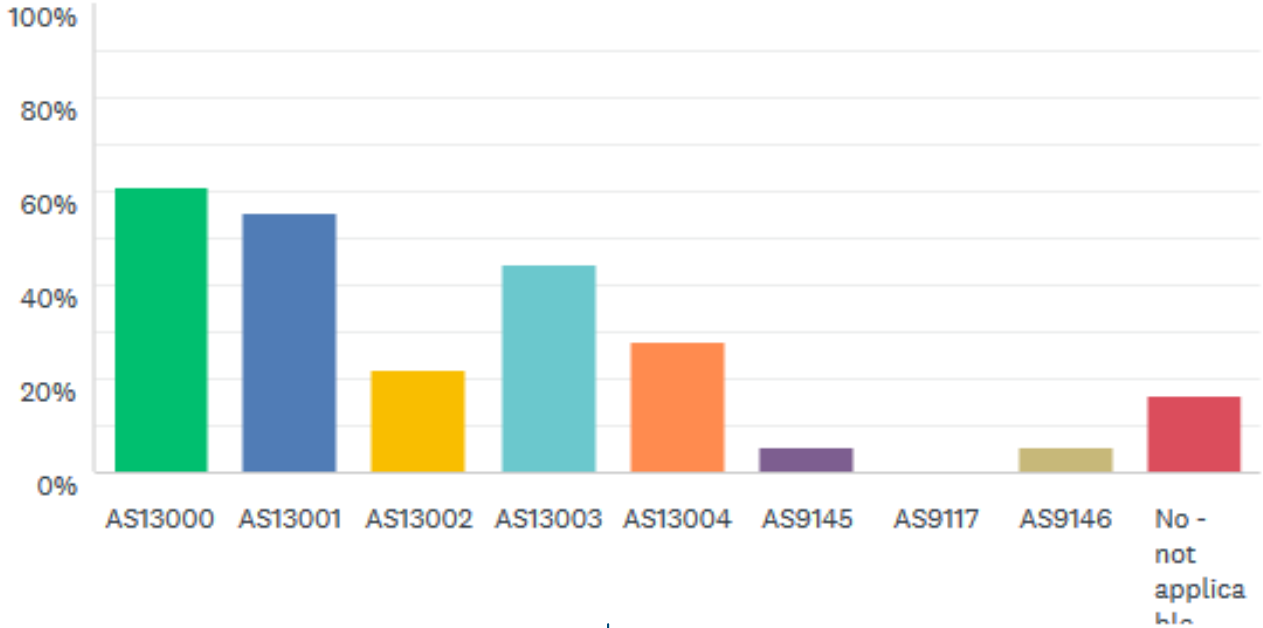
Training
- Coordinated training efforts

Are you Aware of the Published Standards?



We still have some work to do

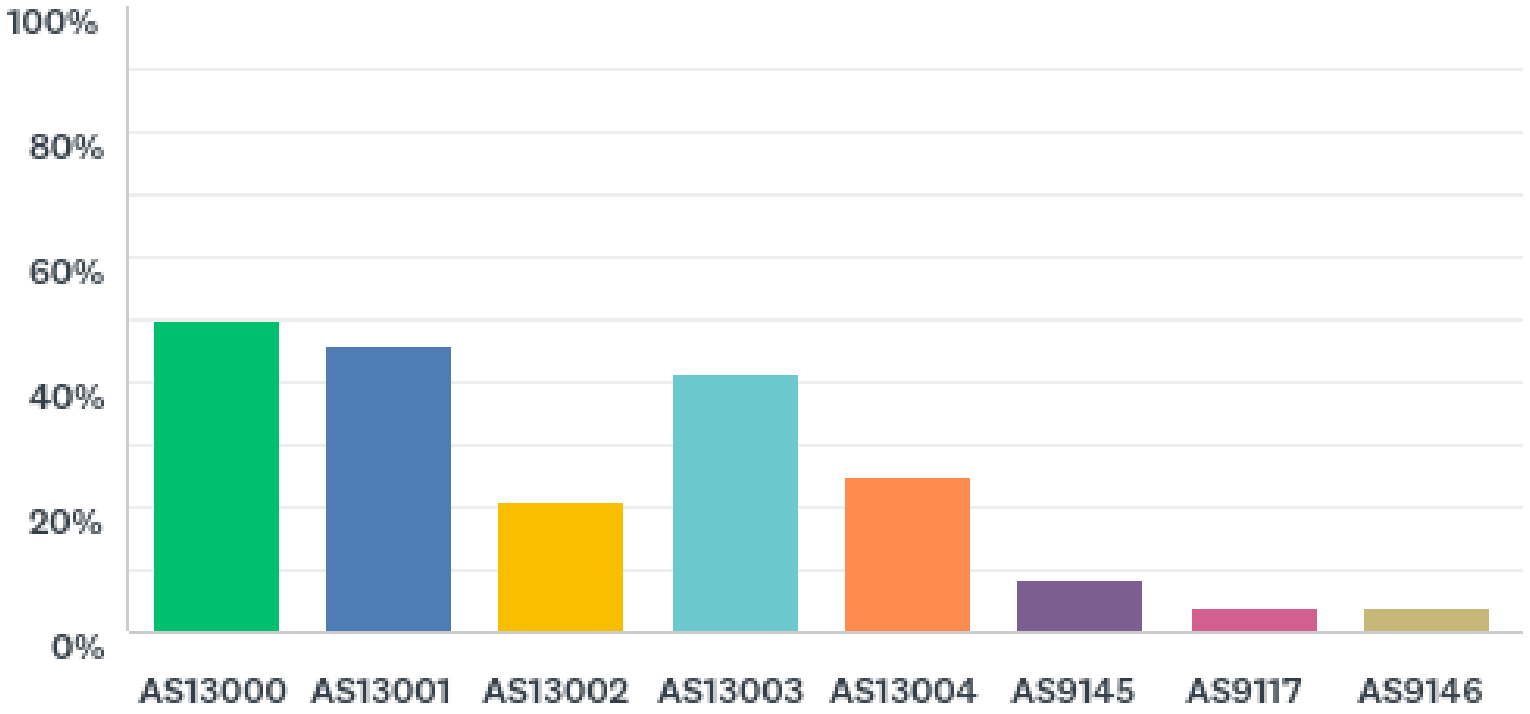
Which Standards Have You Heard Of?



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?



BREAK

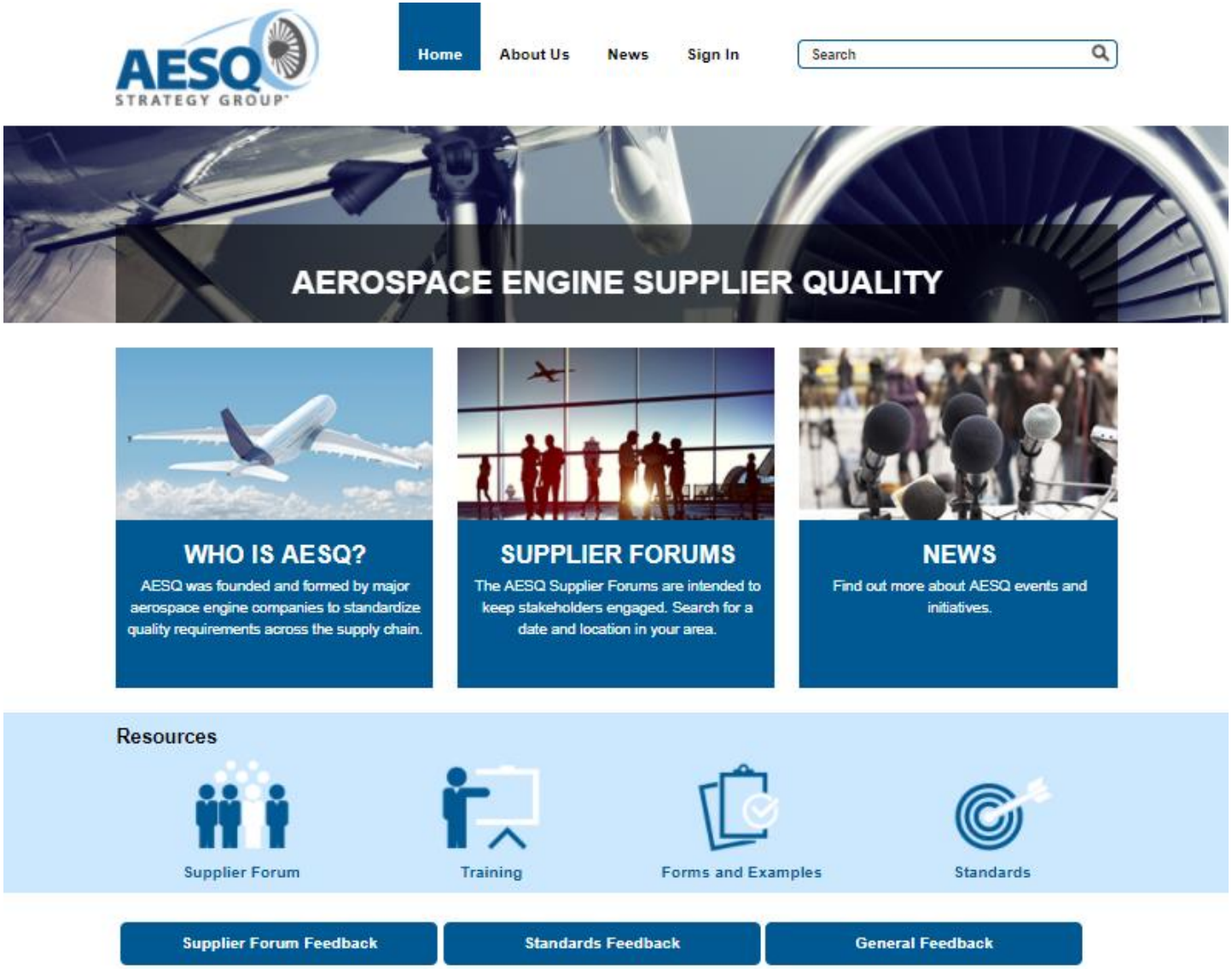
“IS GOOD ENOUGH?” - Video

AESQ STANDARDS OVERVIEW

OLIVIER CASTETS, SAFRAN

HELEN DJÄKNEGREN, GKN

AESQ Website - aesq.saeitc.org



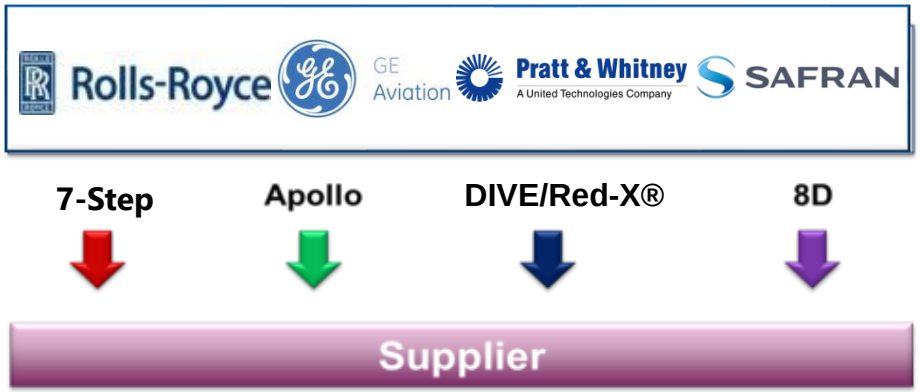
AESQ Guiding Principles

- Simplify & Standardize supplier requirements
- Build on existing industry standards
- Common language for Quality
- Standards are simple, prescriptive & auditable
- Promote standardized 3rd party training
- Easy to adopt within existing process/systems

Deliver results rapidly through focused activities

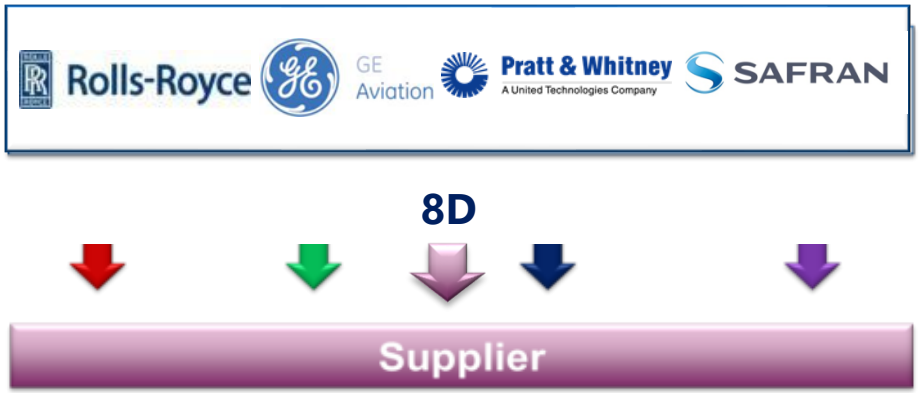
AS13000 Problem Solving

Original State



Future State

GLOBAL 8D



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

AS13001A Delegated Product Release Verification Training

Original State

Future State

- One Common Training Requirement
- Industry-wide DPRV database through SAE
- Delivered globally by SAE
- Refresher 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 customers & suppliers
- Reduced training time for DPRV personnel
- Training provided in region of DPRV personnel
- Customer training limited to on-site

* *Rev A aligns with AS9117 - DPRV*

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

AS13003 Measurement Systems Analysis

Original State

Future 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

- [x] Standardise
- [ ] Simplify
- [x] Adopts Existing Industry Standards
- [x] Prescriptive, Auditable
- [x] Common Language
- [x] 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

AS13002 Inspection Frequency

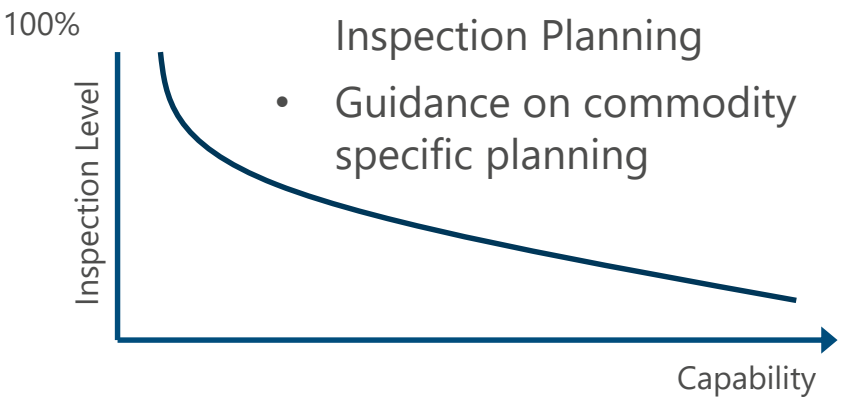
Original State

100% Inspection

REDUCED Sample

Error Proof AQL

Future 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

AESQ Standards – Global Deployment

Vision

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

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

SAE ITC's AESQ Strategy Group Provides Aerospace Industry Savings Through Standardization

Record Supplier Forum in Singapore Attracts Record Attendance

supply chain

Aligning quality requirements for aerospace engine supply chain

Aerospace engine manufacturers and suppliers combine efforts to accelerate quality, reduce waste, and save millions.

- **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**

MARKETPLACE #1 PUBLISHED AESQ STANDARDS

BARRIE HICKLIN, HONEYWELL

Marketplace #1

15 minutes per table

Published Standards (4 Teams)

STANDARD	TITLE	FACILITATORS
AS13000	Problem Solving Requirements for Suppliers (8D)	Olivier Castets Helen Djäknegren
AS13001	Delegated Product Release Verification Training Requirements	Earl Capozzi Catherine
AS13002	Requirements for Developing and Qualifying Alternate Inspection Frequency Plans	Dave Goldberg Barbara Negroe
AS13003	Measurement Systems Analysis Requirements for the Aero Engine Supply Chain	Ian Riggs Martin Schaeffner

Sensing Session 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

BENEFITS OF THE STANDARDS & SUPPLIER CONTRIBUTIONS TO AESQ

AS13001 DPRV TRAINING

REDUCING NON QUALITY EVENTS BY DEPLOYING DPRV AT SAFRAN SUPPLIER FACILITIES

CATHERINE CATARINA-GRACA, SAFRAN

PROCESS TO BECOME A DPRV
2017 Update

3 MONTHS

1 MONTH

DPRV Certification following AS9117 DPRV & AS13001

PROCESS TO BECOME A DPRV
2017 Update


PROBITAS AUTHENTICATION

Probitas Authentication certifies

B Z

Has successfully completed

Aerospace Supplier Quality: Common Training for Self Release Delegates

As required by

AS13001 SUPPLIER SELF RELEASE TRAINING REQUIREMENTS

CERTIFICATION DATE: MAY 7, 2015
EXPIRATION DATE: MAY 7, 2018
CERTIFICATION NUMBER: 10

SAFRAN

SAFRAN certifie

Delegated Product Release Verification

Xuejun YU,

société DEFONTAINE QINGDAO MACHINERY CO. LIMITED

A suivi avec succès le cursus de certification DPRV

Il répond aux exigences du DPRV pour SAFRAN, selon

EN 9117 Delegated Product Release Verification

AS13001 Supplier Self Release Training Requirement

GRP-0087 Exigences Safran applicables aux Fournisseurs

Date de validité de la certification DPRV : 16/06/2020

Numéro tampon DPRV : SAFRAN DPRV 0739

Société Safran ayant validé votre certification DPRV délivrée par SAE International

Nom de l'AQF : .....

Date de l'audit DPRV : ...../...../.....

Signature de l'AQF : .....

Setting up the function

On site audit
By Safran QE

Granting the SAFRAN DPRV stamp
And the SAFRAN certificate if the audit is conclusive

DPRV DUTIES

1 Check the **documentation.**
(Mainly consistency between the routing sheet and the delivery documents)

2A Perform a **physical check**.
(Marking, visual, ...)

2B Check the consistency between **the packaging and labeling with the specifications** of the item ordered by Safran.

3 Record monitoring in the DPRV **log.**

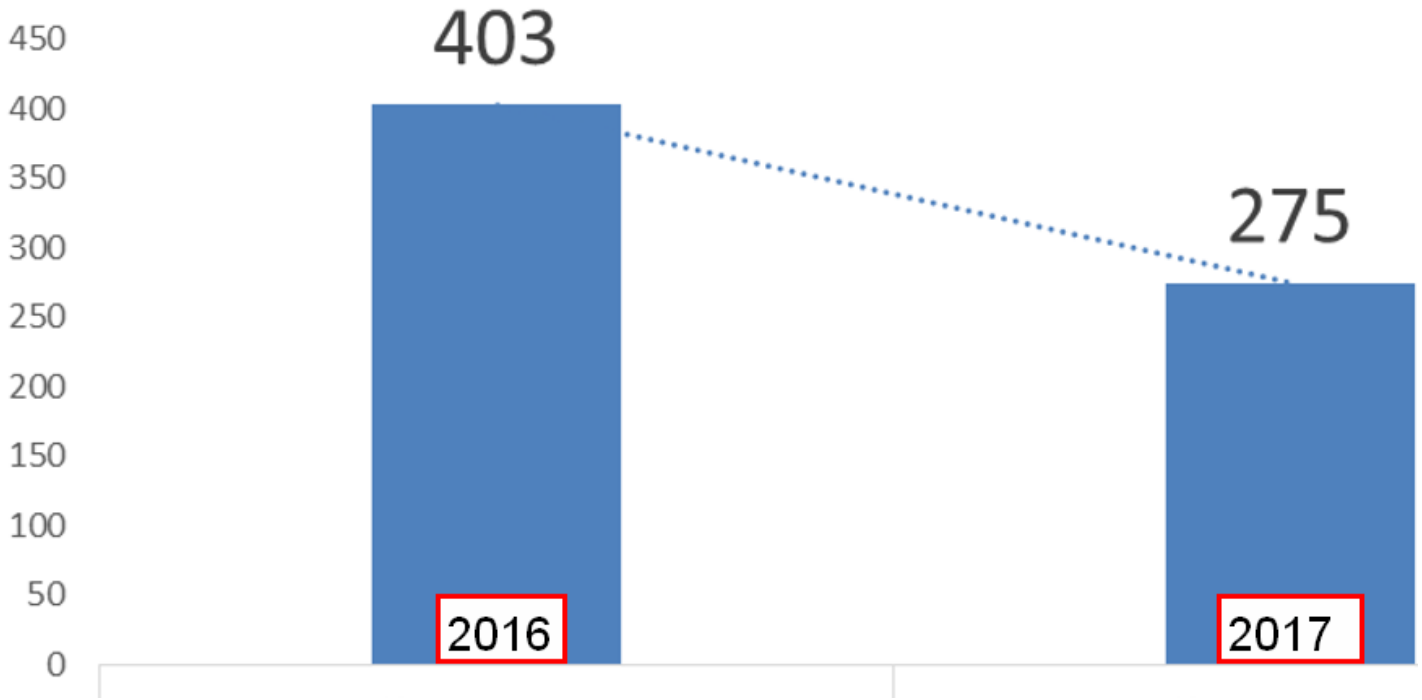
RECORD MANAGEMENT

On Safran Aircraft Engines Quality ERP
Check over more than 1000 claims

FAULT	DEFINITION
C00	CONDITIONING PACKAGING
P00	DOCUMENTATION
T00	MARKING / IDENTIFICATION / TRACEABILITY / MANAGEMENT (GENERIC)
V00	APPEARANCE / VISUAL / FINISH (GENERIC)

NON QUALITY EVENTS
2016/2017 update

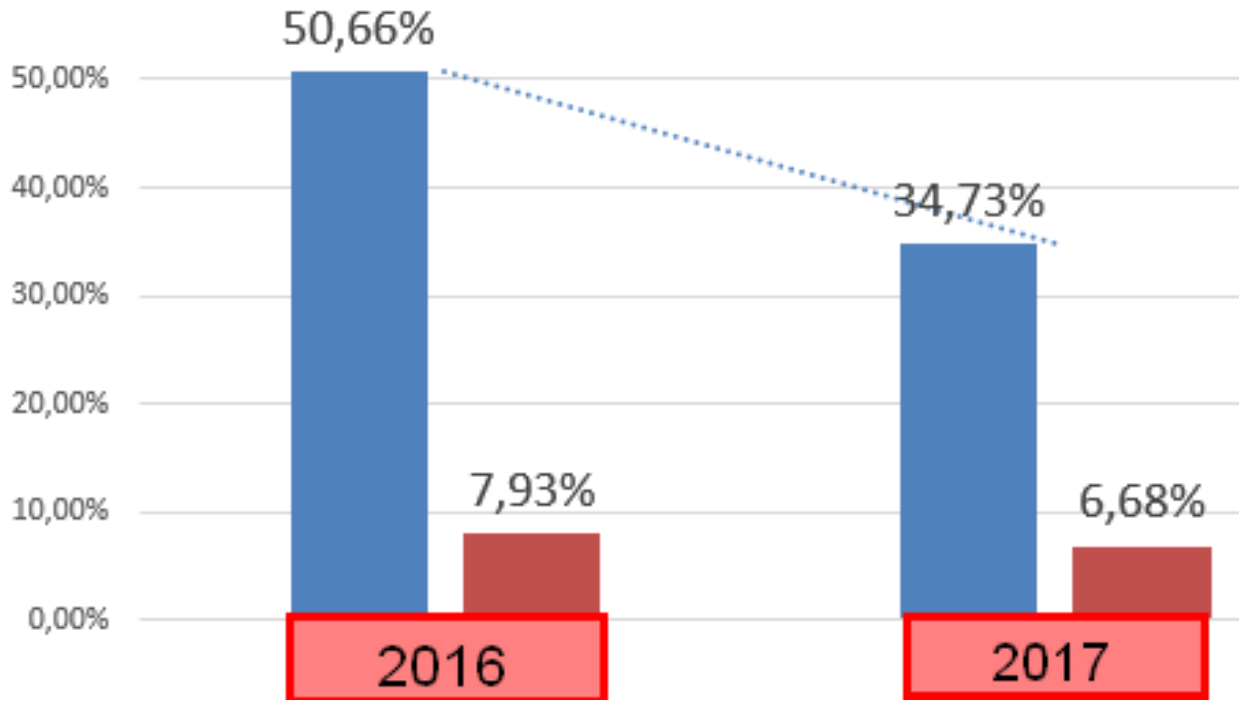
Safran Aircraft Engines Claims : DPRV Deployed



Diminishing despite the LEAP ramp up

NON QUALITY EVENTS
2016/2017 update

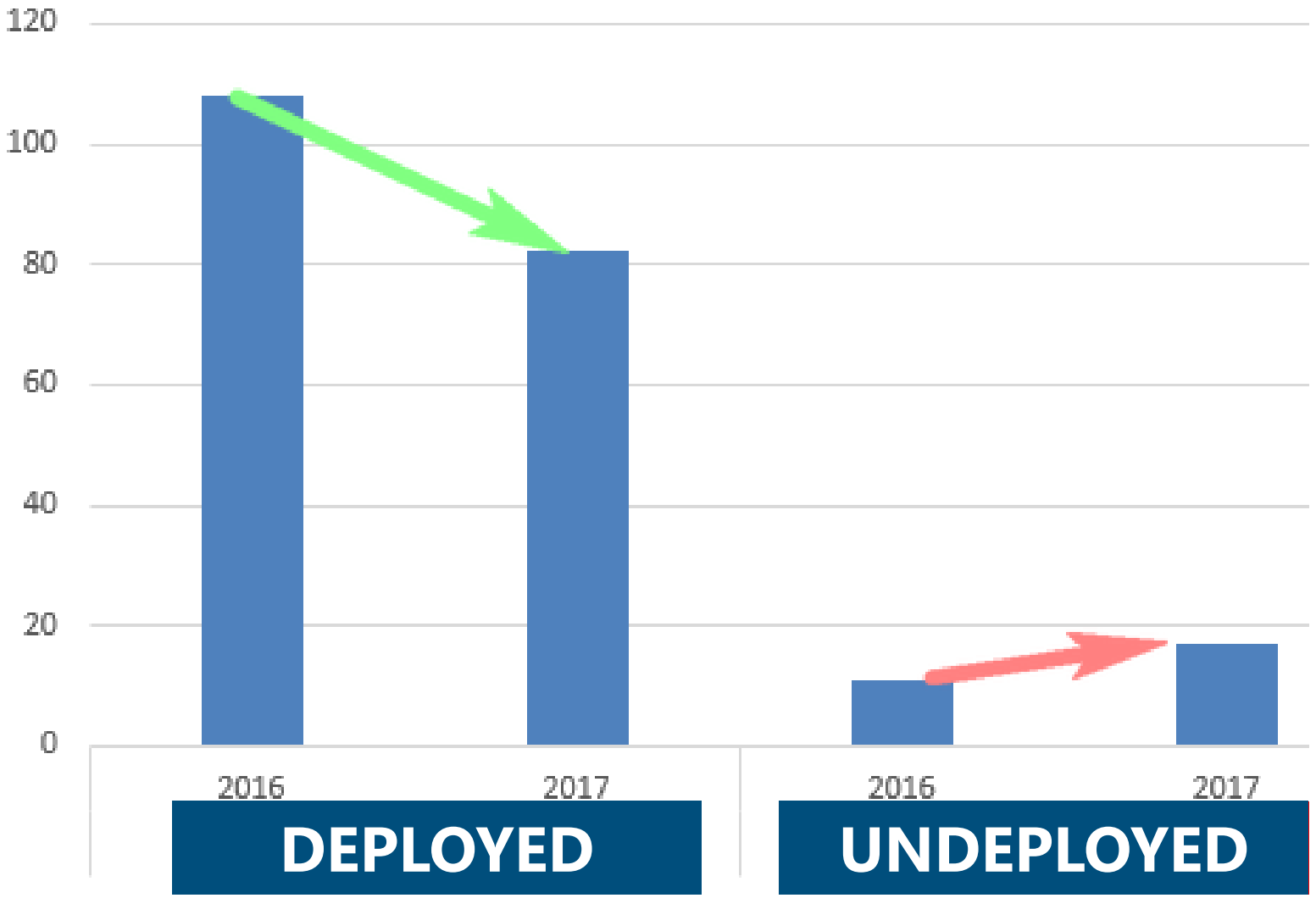
Comparing deployed and non deployed sites



83% of DPRV deployed sites

17% of DPRV undeployed sites

WHAT ABOUT MARKING EVENTS ?

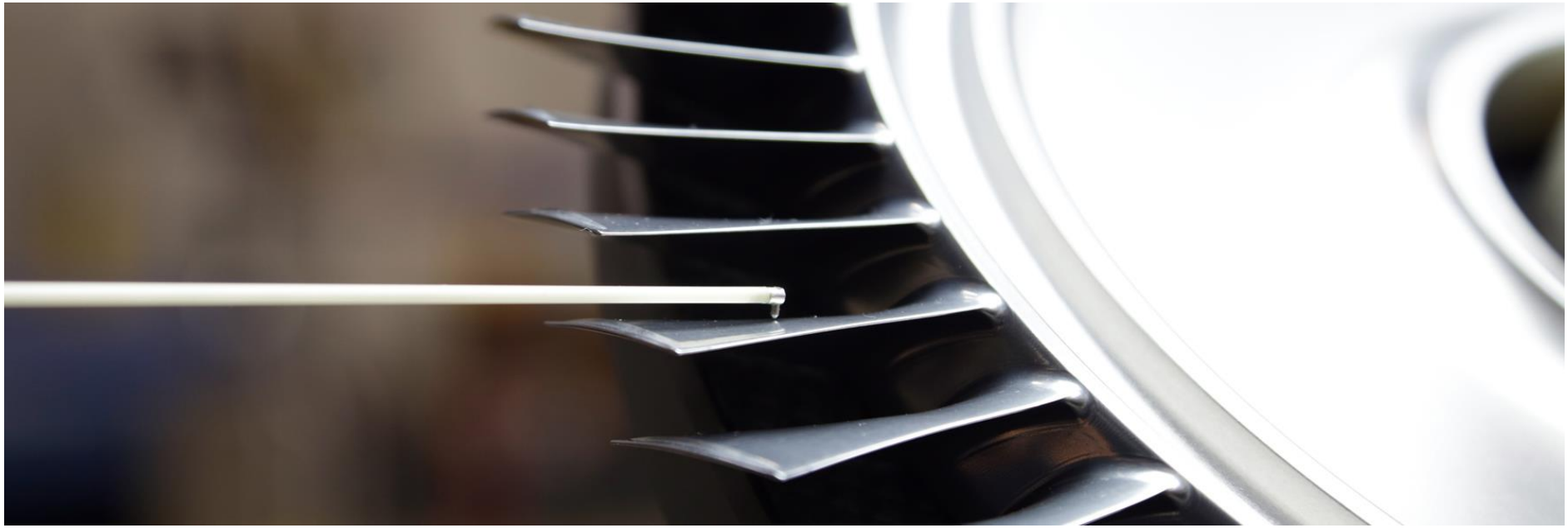


IMPROVEMENT ACTION PLAN

- Communicating on metrics : going ahead with DPRV Deployment
- Specific improvement action plan on « top 10 » SAFRAN impacting suppliers
- Raising awareness on SAFRAN and Safran Aircraft Engines requirements for DPRV managers (8 workshops worldwide) focused on SAFRAN & AESQ standards
- SAFRAN and Safran Aircraft Engines Communication kit are updated twice a year
- Promote Benefits of DPRVs as 9 SAFRAN companies are going live

AS13003

MARTIN SCHAEFFNER, MTU



MSA@MTU

Experiences from using the Measurement System Analysis method at MTU

Martin Schäffner

10/03/2017

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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*

"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

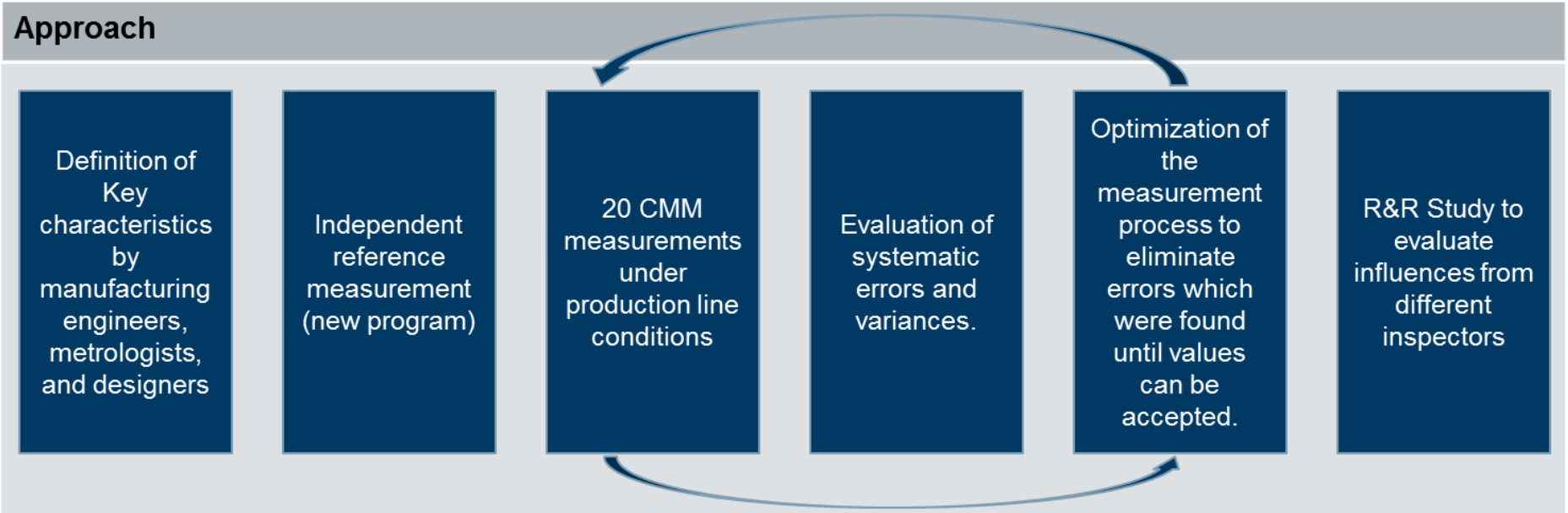
Case, Turbine

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

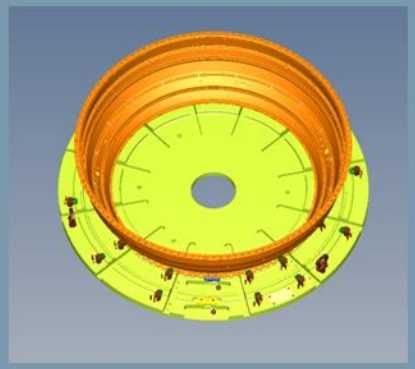
  → The cause was found in changing the measuring fixture

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

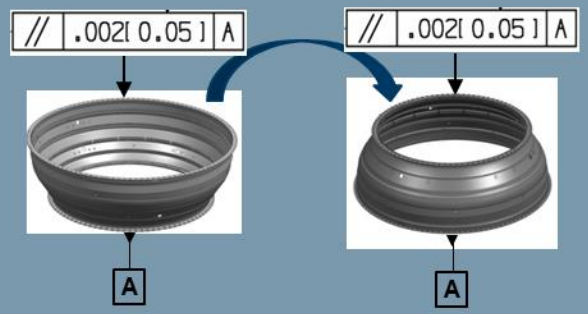
  → Together with engineering the reference plane was changed

Standard CMM for this part family

New CMM



Rework of the measuring fixture



Change made to the drawing

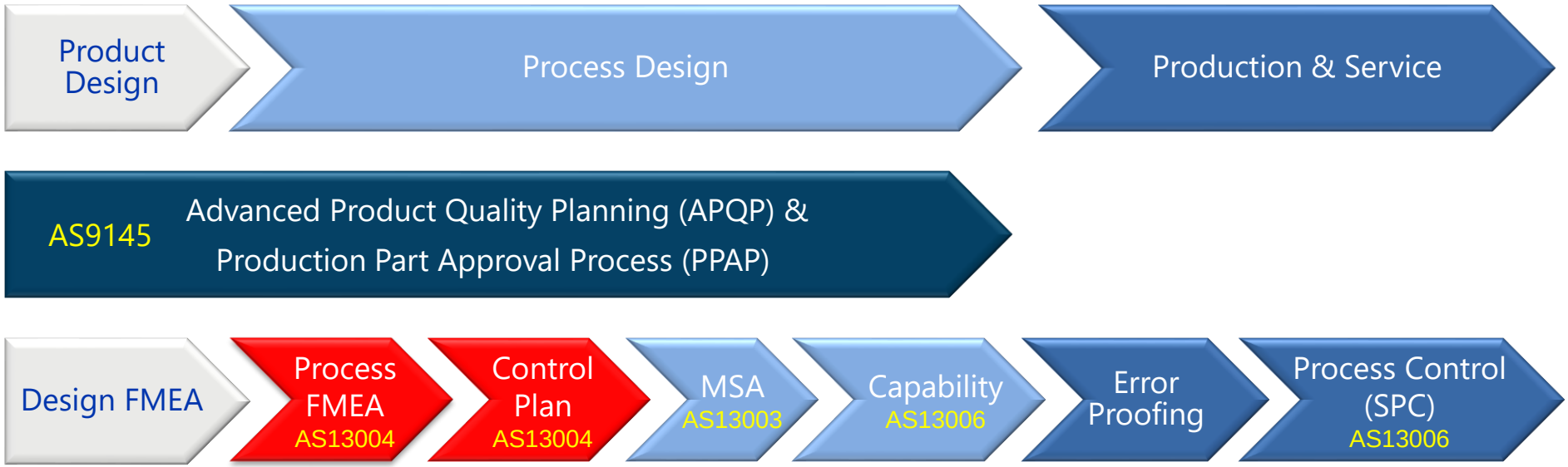
Lessons Learned up to now

- 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

BENEFITS OF AS13004 – PFMEA

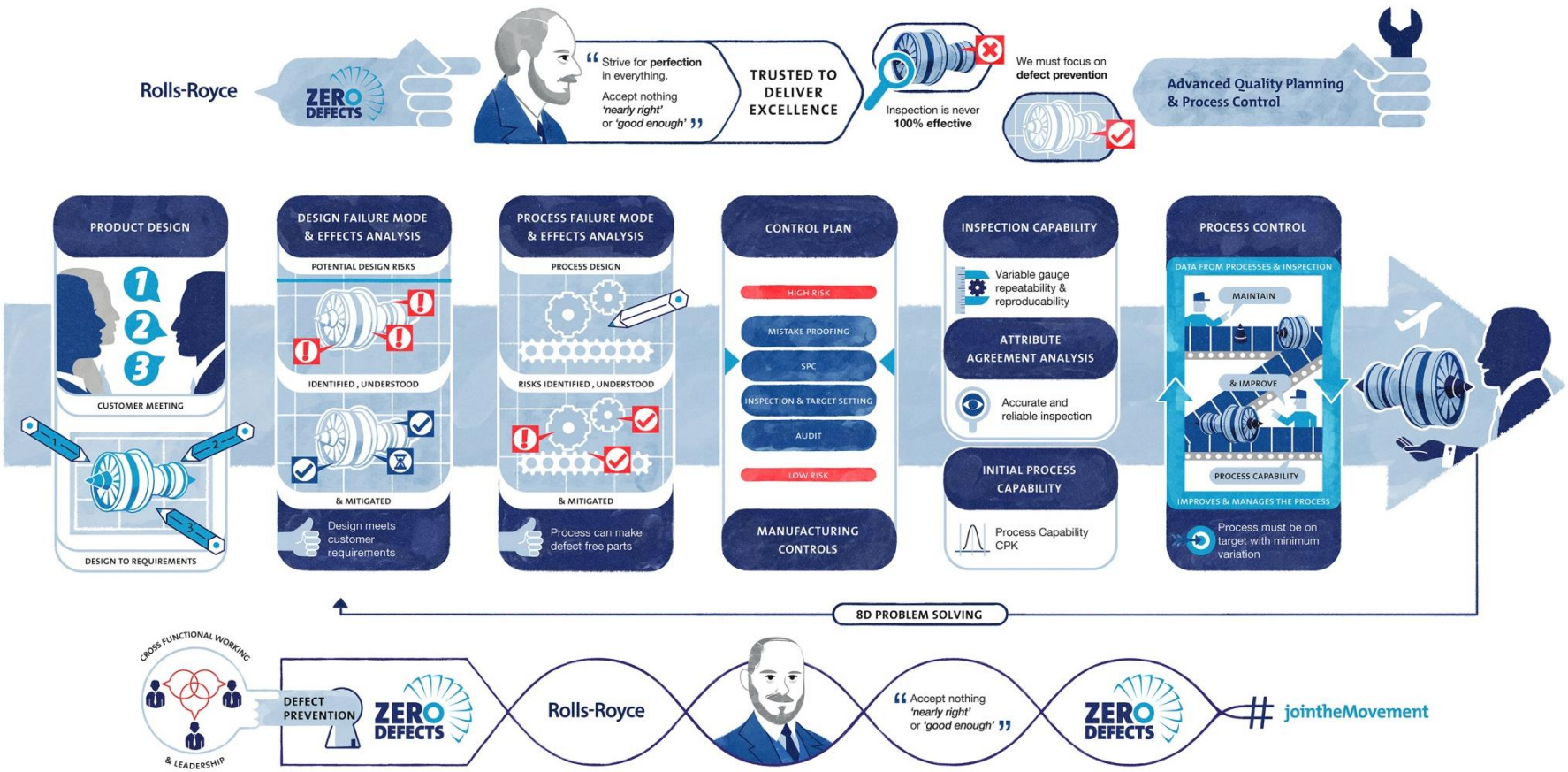
DR IAN RIGGS, ROLLS-ROYCE

Core Product Defect Prevention Tools



Must be applied as a 'system' of tools
Must be applied at part number level
Effectiveness relies on Cross Functional working

Defect Prevention Key Quality Tools for Zero Defects



Rolls-Royce

AS13004 Process FMEA & Control Plan

What's New

1. A Process FMEA for ***every*** part number
2. A Process FMEA that covers ***all*** Process Steps (those that transform the product)
3. A Process FMEA that covers ***all*** design features / characteristics
4. **Failure Modes that describe how the PRODUCT can fail to meet Design Intent**
5. **A Control Plan for *every* part Number**

AS13004 Process FMEA & Control Plan

DON'T PANIC!

It *is* an achievable task, thanks to:

Computer Software e.g. xFMEA, DataLyzer, etc.

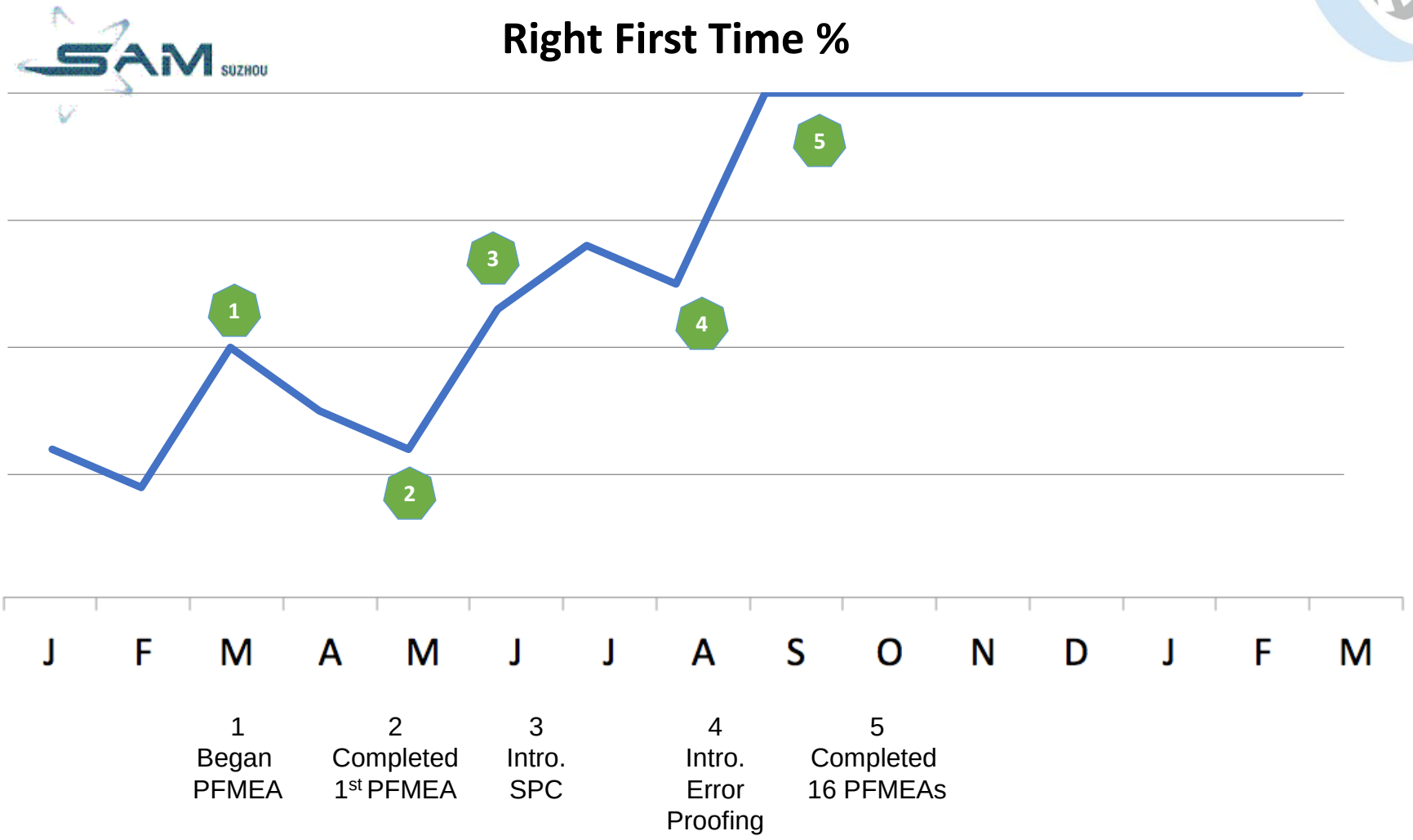
The use of Reference PFMEAs (see later)

Being part of a Large Network – sharing lessons learnt

AS13004 Deployment Case Study

- SAM Suzhou – Precision Machining Supplier based in Suzhou, China
- Circa 300 employees
- Produces Engine Mounts for Rolls-Royce (200+ features)
- Began Process FMEA journey with Rolls-Royce for NPI in April 2017 (in line with AS13004)
- R-R requires PFMEAs to AS13004 to be completed for all NPI, Key Source & Method Changes and Major Quality Escapes

AS13004 Deployment Case Study



SAM Suzhou Success

Key Learning:

- Once trained, they just 'got on with it'
- They set aside time each week to develop PFMEA
- Once defined they took actions to mitigate the identified risks e.g. SPC, error proofing
- Now deploying PFMEA onto all legacy Rolls-Royce part numbers

In 2018 SAM Suzhou won the Rolls-Royce most Improved Supplier Award.

They continue to be Defect Free into Rolls-Royce…

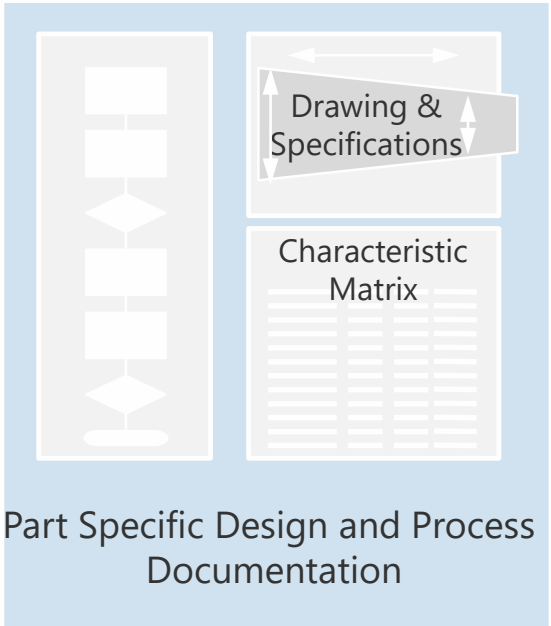
Using Reference PFMEAs

Process	Requirements	Potential Failure Modes	Potential Effects	SEV	Potential Causes	Prevention Controls	OCC	Detection Controls	DET	RPN
OP10 CNC Drilling	Drill Fuel Hole 50mm Diameter +/- 1.0 mm	Hole too Big	Fuel leak leading to explosion	9	Oversize tool	Tool pre-setting	4	Bore mic at OP 50	7	252
			Scrap part	6	Spindle alignment error	Asset Care & Calibration	3	Weekly ball bar check	8	216
OP20 CNC Drilling	Drill Air Hole 50mm Diameter +/- 3.0 mm	Hole too Big	Slight increase in noise level	3	Oversize tool	Tool pre-setting	2	Bore mic at OP 50	7	56
			Concession	4	Spindle alignment error	Asset Care & Calibration	1	Weekly ball bar check	8	32

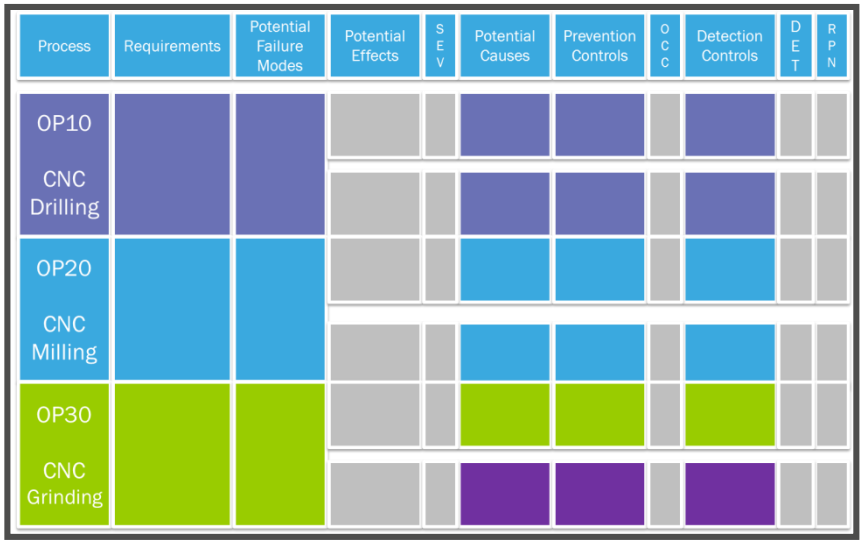
Blue Boxes show the (partial) content of a Reference PFMEA for Hole Drilling where the Failure Mode is 'Hole Too Big'

Creating a Part Specific PFMEA Using Reference FMEAs

Reference PFMEA Database



'Shell' Part Number PFMEA



A 'shell PFMEA is created for each operation and every feature / specification required to produce a specific part number using the Process Flow Diagrams, Characteristics Matrix and Drawing / Specifications.

Completing the Part Number Specific PFMEA

Process	Requirements	Potential Failure Modes	Potential Effects	SEV	Potential Causes	Prevention Controls	OCC	Detection Controls	DET	RPN
OP10 CNC Drilling	Drill Fuel Hole 50mm Diameter +/- 1.0 mm	Hole too Big	Fuel leak leading to explosion	9	Oversize tool	Tool pre-setting	4	Bore mic at OP 50	7	252
			Scrap part	6	Spindle alignment error	Asset Care & Calibration	3	Weekly ball bar check	8	216
OP10 CNC Drilling	Drill Air Hole 20mm Diameter +/- 3.0 mm	Hole too Big	Slight increase in noise level	3	Oversize tool	Tool pre-setting	2	Bore mic at OP 50	7	56
			Concession	4	Spindle alignment error	Asset Care & Calibration	1	Weekly ball bar check	8	32

Additions and subtractions

Additions and subtractions

The team may need to add in additional Failure Modes, Potential Causes and/or Control information based on their knowledge of the specific part numbers. Some information in the Reference PFMEA may not be relevant so can be deleted.

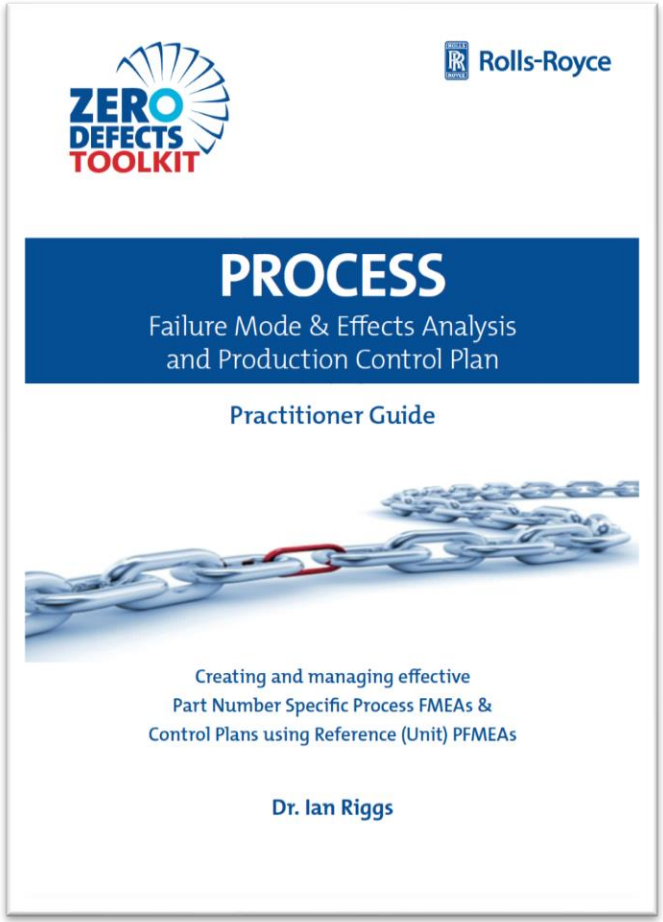
How we can Help

Process PFMEA Practitioner Guide for developing PFMEAs & Control Plans to AS13004 including the creation and use of Reference FMEAs is available free of charge (electronically or hard copy) from Rolls-Royce

Rolls-Royce will make its Reference PFMEAs available to external businesses to promote the deployment of AS13004 (see Guidebook for details)

We recommend that suppliers invest in a suitable FMEA software tool to manage the level of data created efficiently

We have developed Global PFMEA training to support this approach with Smallpeice Enterprises and Industry Forum (See Guidebook for details)



It ***really*** is that easy.....

It ***really*** is that effective.....

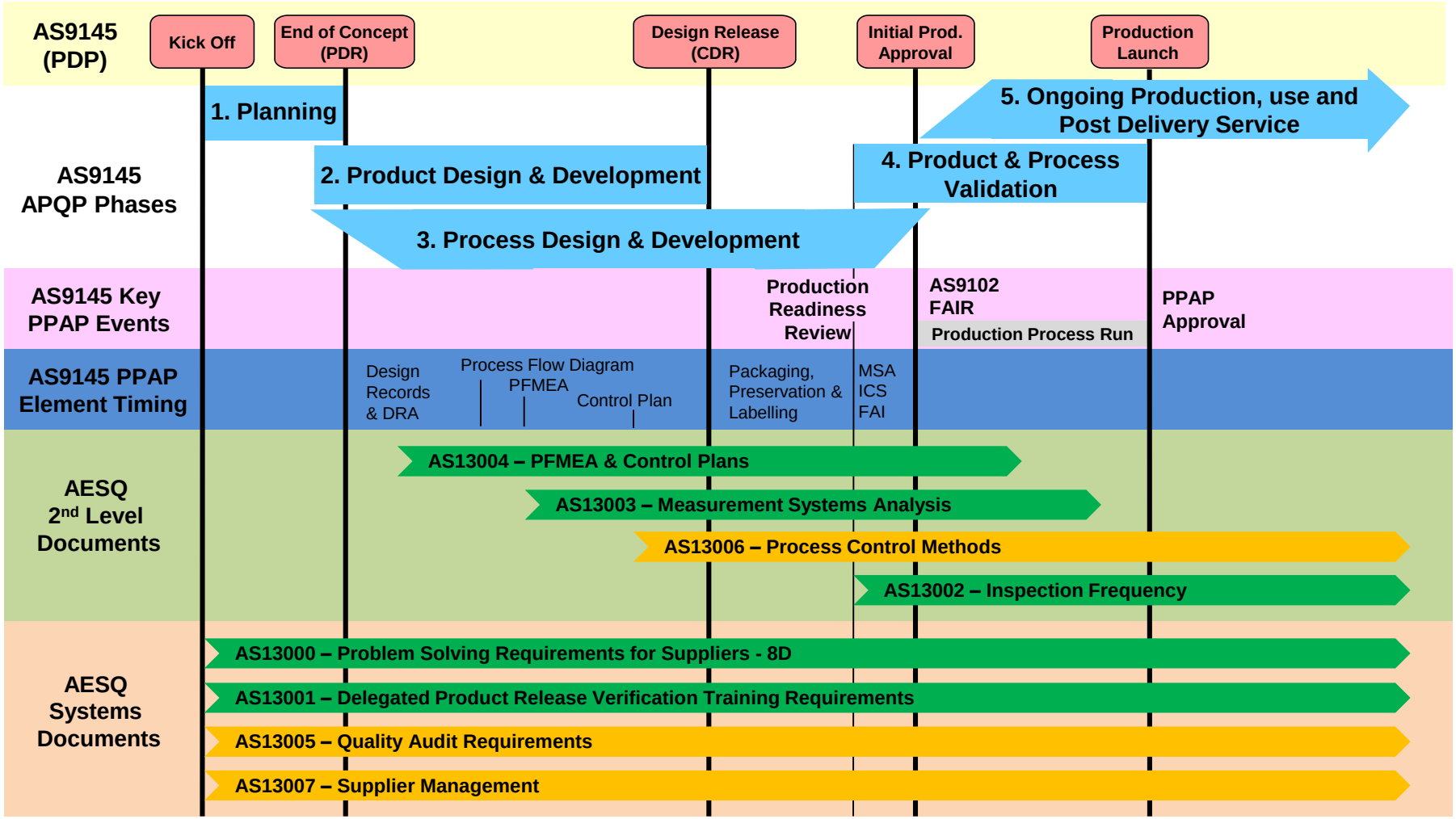
Good luck.

FUTURE INITIATIVES

PETER AMSDEN, PRATT & WHITNEY

Product Life Cycle & Document Interaction

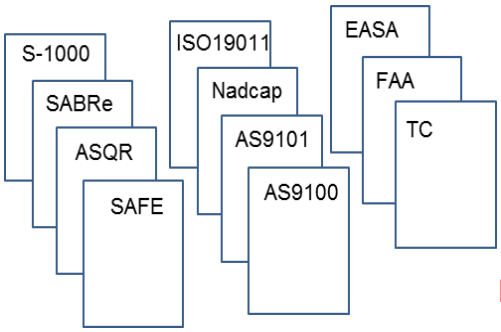
AS9145 (APQP/PPAP) & AESQ Standards



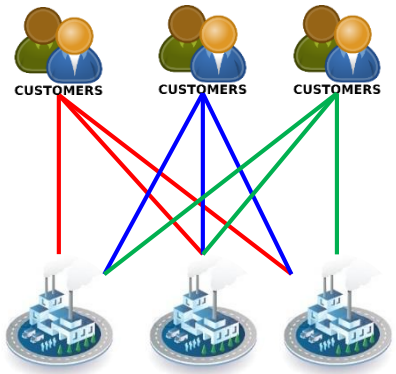
AS13005 Quality Audit Requirements

Original State

Internal and supplier audit requirements in many documents



Every Customer Audits Every Supplier



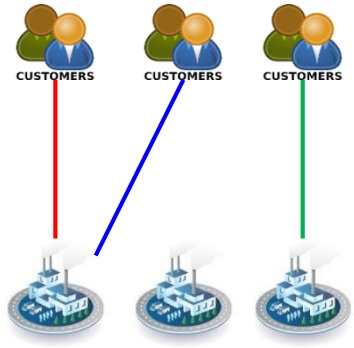
Internal Audits for Many Requirements

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

Risk Based Supplier Audit



One Common Requirement for Internal Audit

AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ 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

AS13006 Process Control Methods

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

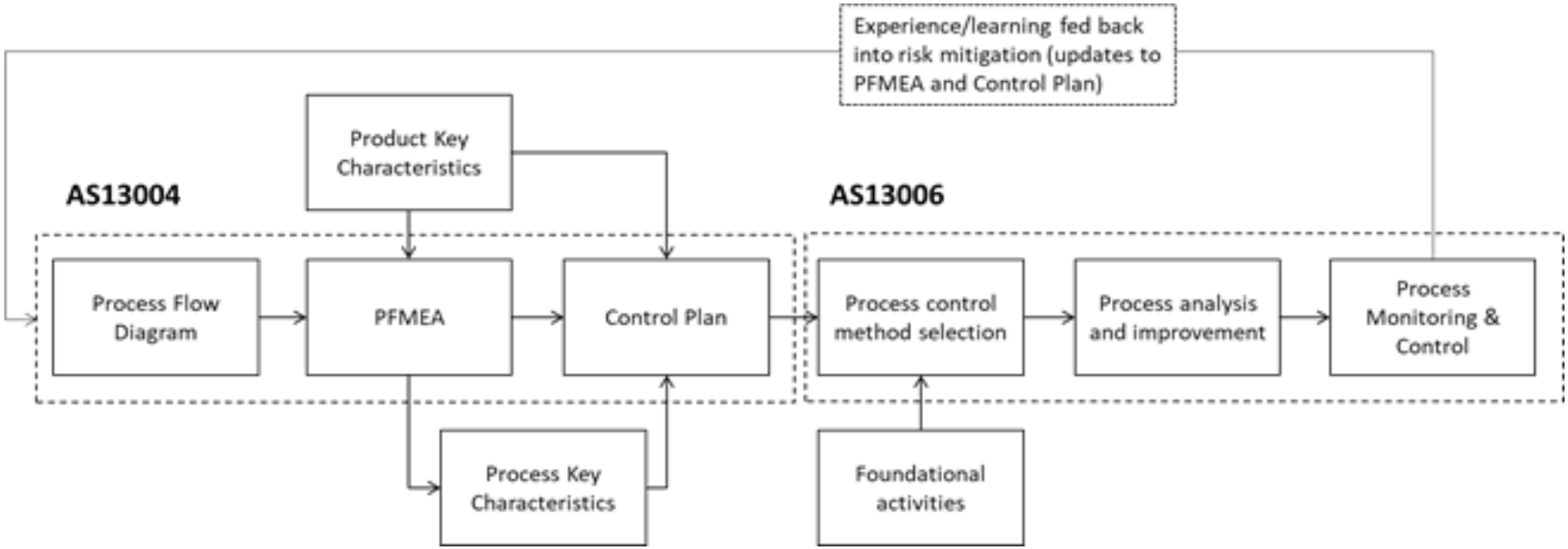
AESQ Principles

- ☑ Standardise
- ☑ Simplify
- ☑ Adopts Existing Industry Standards
- ☑ Prescriptive, Auditable
- ☑ Common Language
- ☑ 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 proactive problem resolution
- Improved Quality Performance, reduced risk

AS13004 & AS13006 Standard Relationships



Related Standards

AS13000: Problem Solving Requirements (8D)

AS13002: Developing & Qualifying Alternative Inspection Frequency Plans

AS13003: Measurement Systems Analysis Requirements

AS9103: Variation Management of Key Characteristics

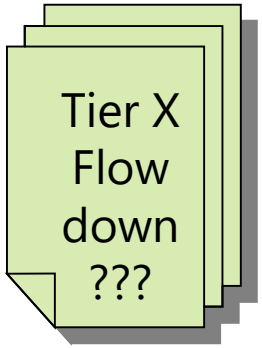
AS9145: Advanced Product Quality Planning & Production Part Approval Process

AS13007 Supplier Management

AS13007 Supplier Management

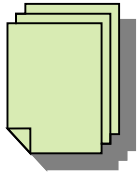
Original State

Varied Customer-Specific Requirements



Future State

Fewer Customer-Specific Requirements



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

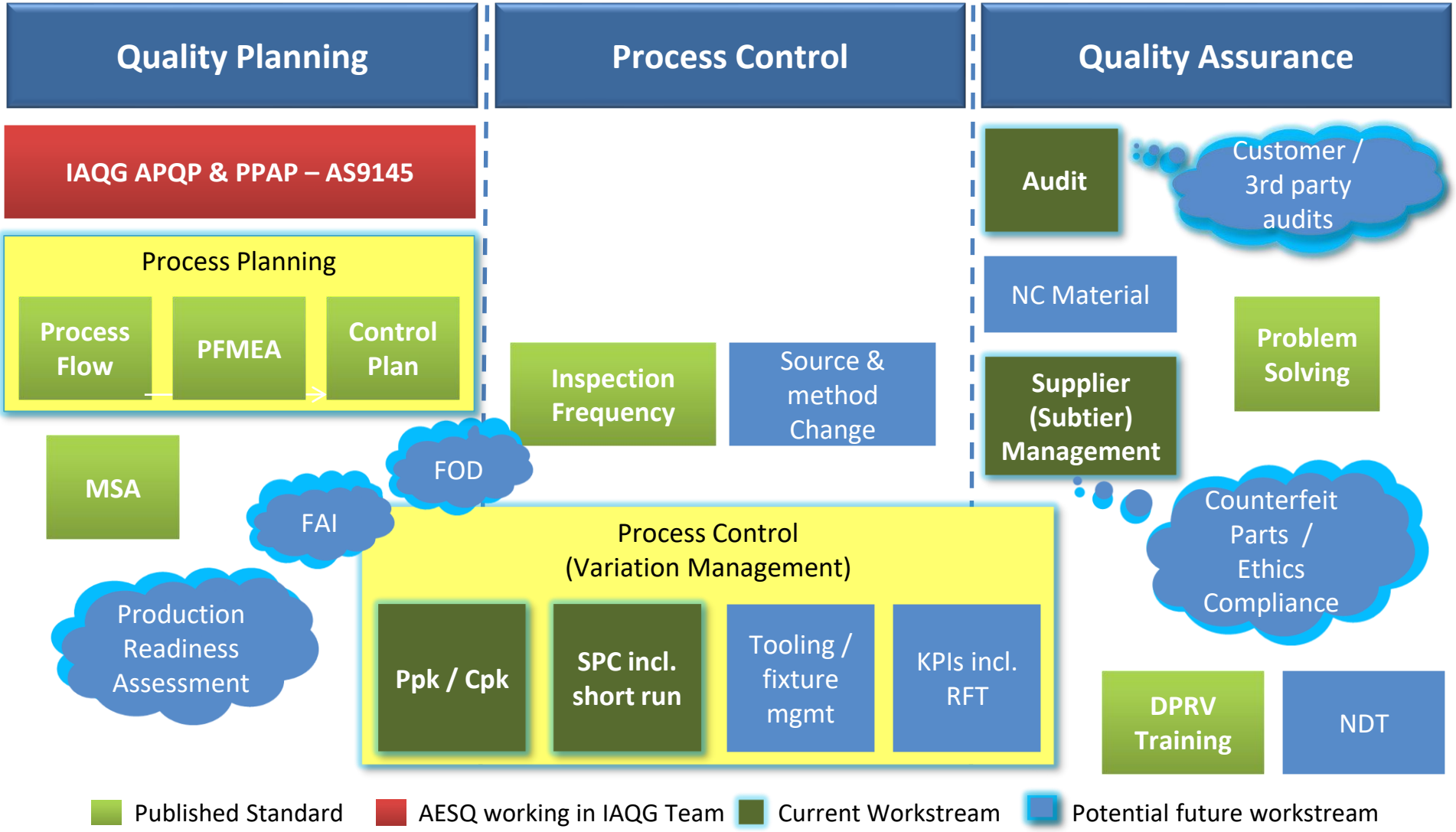
AESQ Principles

- [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")

Existing & Future Workstreams



White Paper Projects

Work in Progress

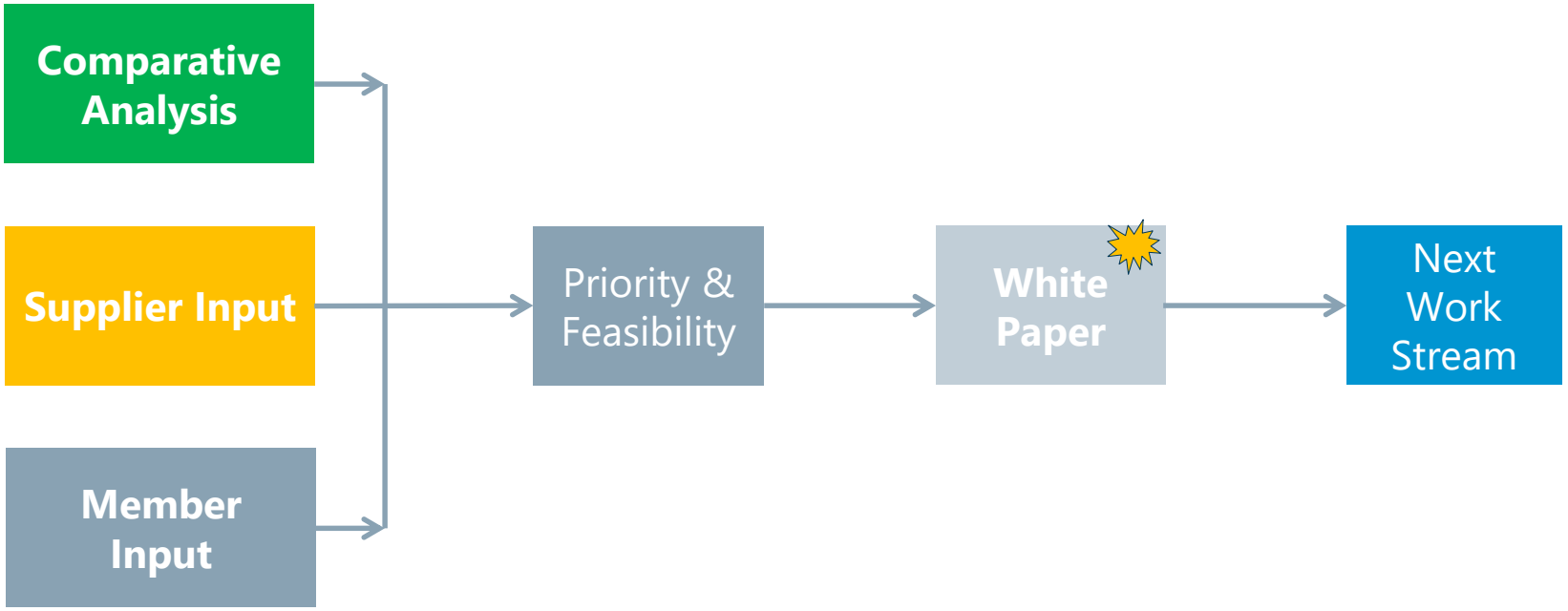
FAI Study Topics

- Interpretation (partial / full FAI)
- Form 3
- Ballooning
- Submission
- Planning FAIR

Non-Conforming Material Study Topics

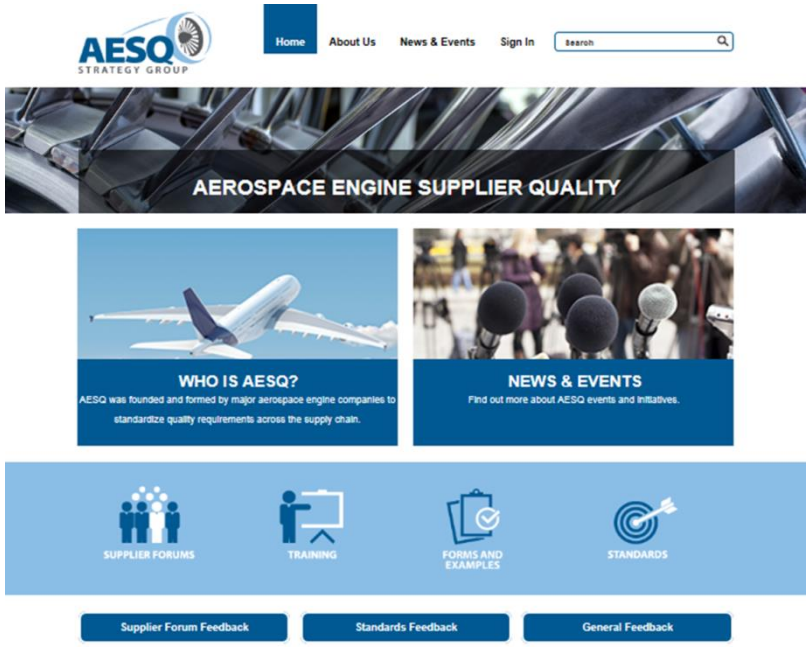
- Guidance (8D)
- Standardize Forms
- Common IT Hub
- Common processes for repair and repetitive concession requests

AESQ Strategic Process Map



Assimilation & prioritization of future AESQ initiatives for standardization and step improvements in quality

How You Can Participate



aesq.saeitc.org/

- Attend our AESQ Supplier Forums
- Provide feedback on current standards & those in developent
- Share best practice deployment stories and impact of standards via the AESQ Website
- Help identify new areas of standardization & future work

Challenge your customers about deployment of standards AESQ members are committed to deploy

BREAK

MARKETPLACE #2

BARRIE HICKLIN, HONEYWELL

Marketplace #2

15 minutes per table

Standards in Development & Future Initiatives (4 Teams)

STANDARD	TITLE	FACILITATORS
AS13005	Quality Audit Requirements	Helen Djäknegren & Catherine Catarina-Graca
AS13004 AS13006	PFMEA & Control Plans Process Control Methods	Peter Amsden Dave Goldberg
AS13007	Supplier Management	Thomas Schmitt Barbara Negroe
	Future Standards	Dele Awofala Martin Schaeffner

Answer these questions for each Workstream developing a Standard

1. What are the main challenges or difficulties?
2. What misalignments are apparent between your customers?
3. What are your concerns and recommendations (including training)?
4. Are there any commodity specific considerations?

MARKETPLACE SUMMARY

BARBARA NEGROE, GE AVIATION

Marketplace Summary Session 1

STANDARD	KEY FEEDBACK	FACILITATORS
AS13000 (Problem Solving)	• How to find internal sponsorship? • Small or large issue – can be applied	Olivier Castets Helen Djäknegren
AS13001 (DPRV)	• Point of contact at OEMs • Translation – language issue	Earl Capozzi Catherine
AS13002 (Inspection Frequency)	• Special processes not covered (NDT) • Order of implementation (13006)	Dave Goldberg Barbara Negroe
AS13003 (MSA)	• Guidance material will be helpful • Deployment details not available in standard ("how" part is missing)	Ian Riggs Martin Schaeffner

Marketplace Summary Session 2

STANDARD	KEY FEEDBACK	FACILITATORS
AS13005 (Quality audit requirements)	• Risk Analysis • Industrial assessment instead of audit?	Helen Djäknegren Catherine
AS13004 (PFMEA & Control Plans) **AS13006** (Process control methods)	• Make drafts available • Concern about design authority not providing information for PFMEA	Peter Amsden Dave Goldberg
AS13007 (Supplier management)	• Add Ethics category • A common/std form for all suppliers	Thomas Schmitt Barbara Negroe
Future	• Include part marking • Contract review – acknowledgment & spec review	Dele Awofala Martin Schaeffner

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

AESQ Vision

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

LÄTT ATT GORA RÄTT

AESQ Will Drive Progress

Spread the Word

Provide feedback on the AESQ website

SAFE RETURN HOME