
# AS13100 Deployment
# Virtual Supplier Forum
# 4 May 2022

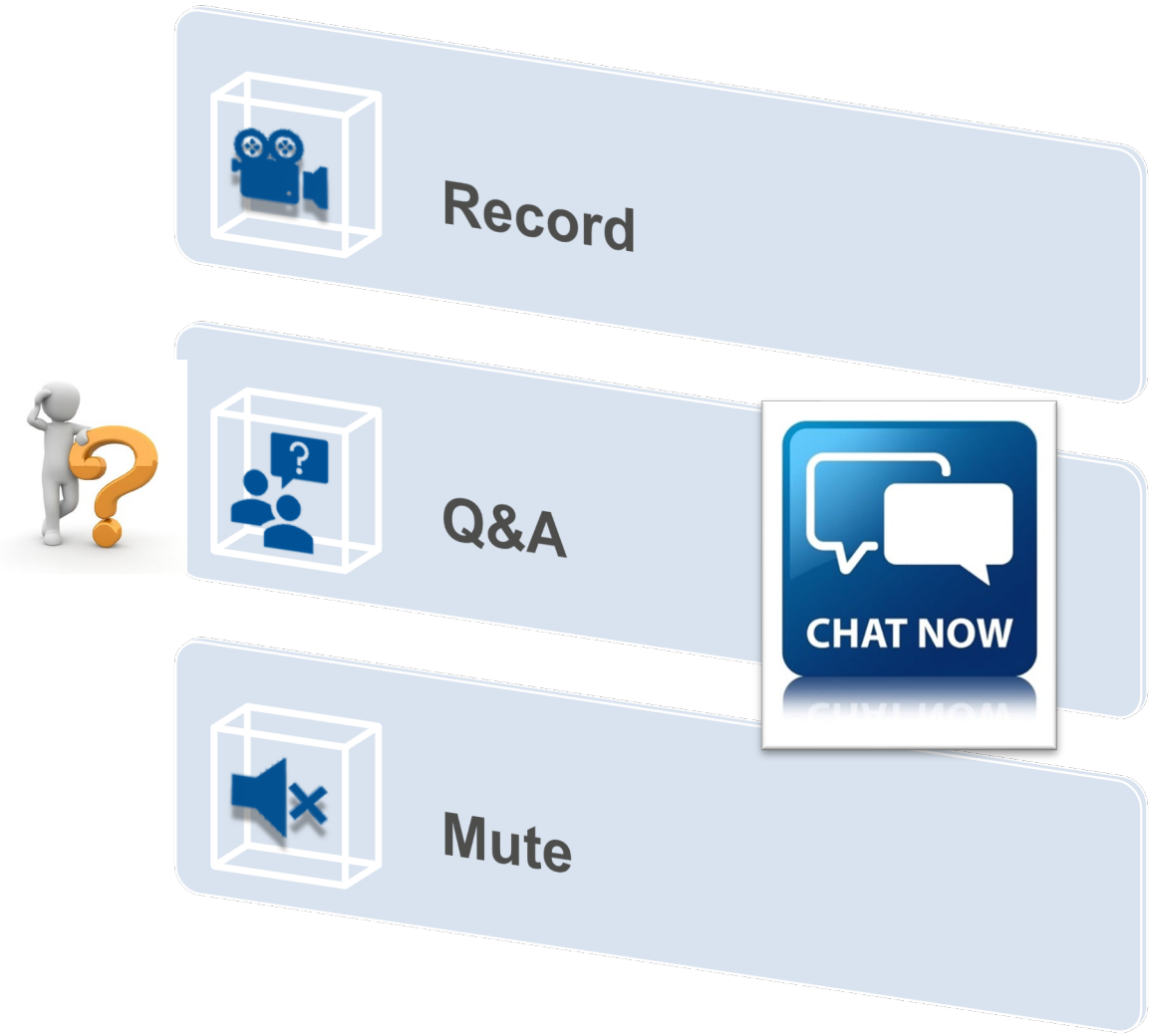
# Registration Overview

# Webinar Overview

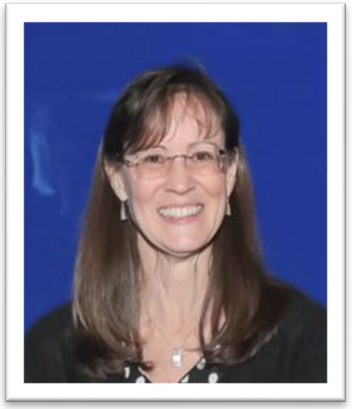
We are **recording** today's webinar and will distribute the video link following the close of the webinar.  It will also be posted on the AESQ website for free viewing.

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.



# How to Contribute

**Becky Lemon**
Industry Program Manager
SAE ITC


**Jim Wilson**
Sr Manager, Supplier Quality
& Development
Pratt & Whitney Canada

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

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

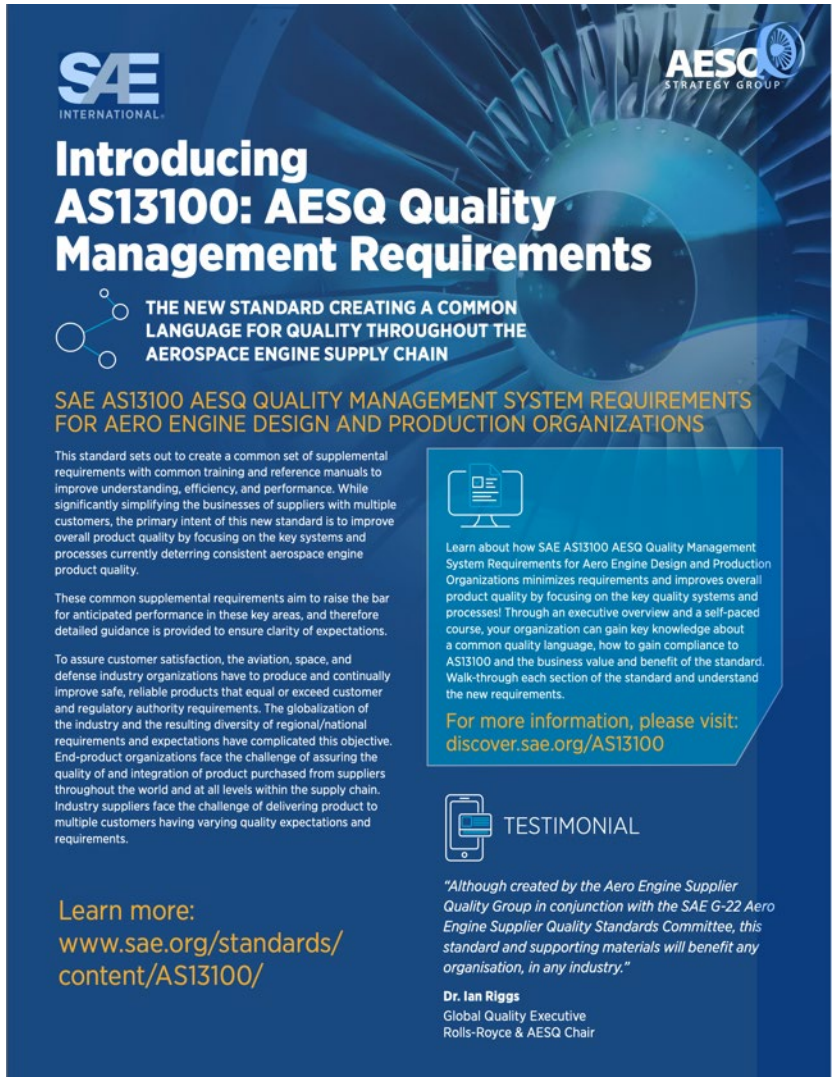
# AESQ Supplier Forums


Typically held twice a year, rotating around North America, Europe and Asia

AESQ Supplier Forums provide an opportunity to;

- Provide updates on the work of the AESQ
- Share best practice
- Provide feedback to the AESQ
- Develop a network of practitioners and Subject Matter Experts

# AESQ Supplier Forum 2022: Focus on AS13100 Deployment

















# Agenda

| Topic | Presenter |
|---|---|
| AESQ Overview, Vision & Objectives | Barbara Negroe, Executive Sourcing Quality Leader, GE Aviation |
| AS13100 Standard Overview | Larry Bennett, Consulting Engineer, Global Sourcing Quality, Supply Chain Division, GE Aviation |
| Deployment Introduction & Milestones | Elizabeth Pace, Supplier Quality Strategy, Associate Director, Raytheon Technologies |
| Deployment Plans:<br>• IHI<br>• MTU<br>• Safran<br>• Pratt & Whitney | • Hiroshi Yamamoto, General Manager, Quality System Dept., IHI<br>• Michael Mrosewski, Quality Management Programs, MTU<br>• Catherine Catarina-Graca, Supplier Management System Coordinator, Safran Aircraft Engines<br>• Paul Morgan, Sr. Director Quality & Processing Engineering, Pratt & Whitney |
| Deployment Dashboard | Elizabeth Pace, Supplier Quality Strategy, Associate Director, Raytheon Technologies |
| Deployment Survey Results | Jim Wilson, Sr. Manager, Supplier Quality, & Development, Pratt & Whitney Canada, &<br>Elizabeth Pace, Supplier Quality Strategy, Associate Director, Raytheon Technologies |
| **BREAK – 15 Minutes** | **BREAK – 15 Minutes** |

# Agenda

| Topic | Presenter |
|---|---|
| Focus on APQP Deployment | Karl Evans, APQP Technical Project Manager, Rolls-Royce |
| Risk Based Audit System – Internal and Supplier | Lisa Stömer, Audit Management, MTU Aero Engines AG (Munich) |
| AESQ How to Get Involved | Jun Sakai, Chief Engineer, IHI Corporation |
| Questions | Jim Wilson, Sr. Manager, Supplier Quality, & Development, Pratt & Whitney Canada |
| Summary & Close | Barbara Negroe, Executive Sourcing Quality Leader, GE Aviation |

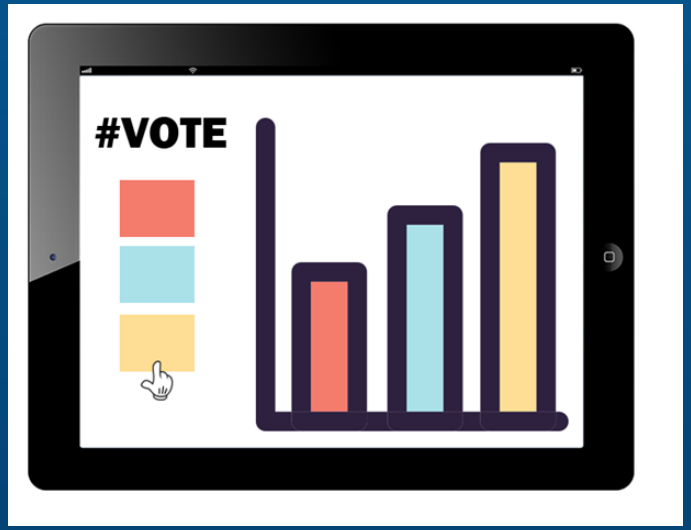
# Use the Chat Function to Ask a Question..


## … or just make a comment

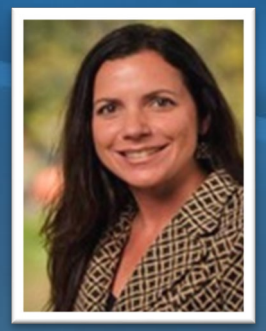
be kind

# POLL QUESTION #1:

What city are your calling in from today?



# AERO ENGINE SUPPLIER QUALITY GROUP (AESQ) OVERVIEW



**BARBARA NEGROE**
EXECUTIVE SOURCING QUALITY LEADER
GE AVIATION

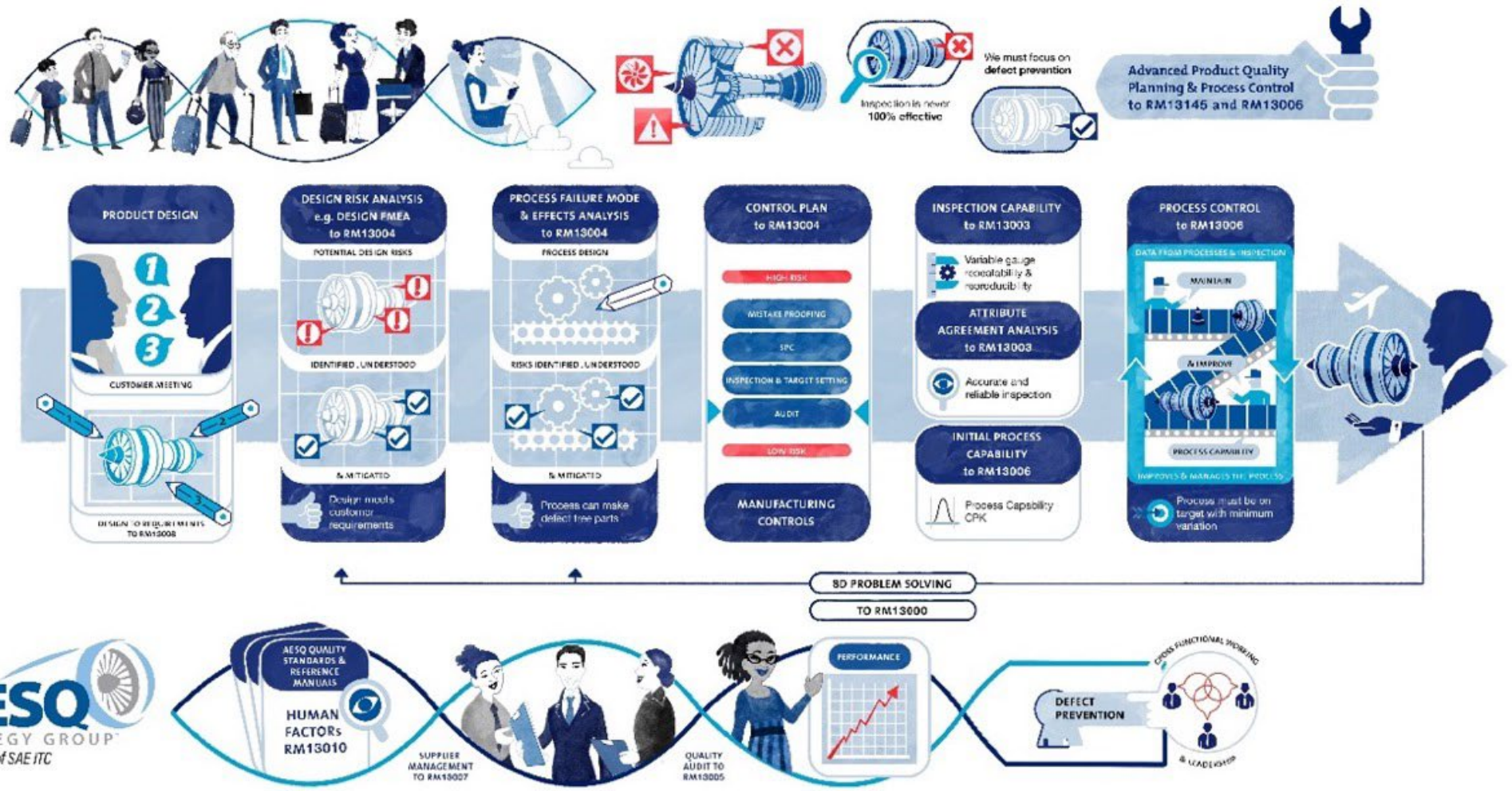
# Aero Engine Industry Burning Platform

***Aero Engine Manufacturers created a Collaboration working group to address burning platform in 2013 with key Global Suppliers***

***Used the Automotive example of QS-9000 with Ford, GM and Chrysler as the model***

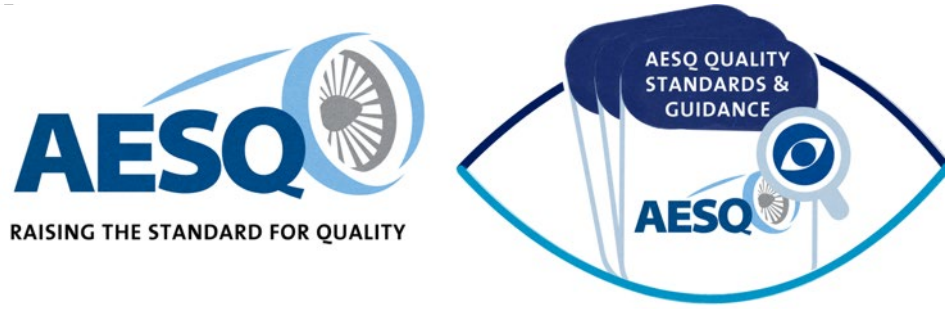
- Airline passengers set to double in size over the next 20 years
- Customers expect Zero Defects
- Increasing level of supplier made engine content
- Global Supplier Footprint
- Large number of common suppliers between engine manufacturers
- Wide range of Aerospace engine supplier businesses, from <$1M to >$2B
- Improving Quality, Cost and Delivery remains a key challenge

# Defect Prevention Key Quality Tools for Zero Defects




**Defect Prevention Tools Must Work as a System**

# Aero Engine Supplier Quality Group Principles





- Aero Engine Manufacturers created a Collaboration working group to address burning platform in 2013 with key Global Suppliers
- Used the Automotive example of QS-9000 with Ford, GM and Chrysler as the model
- Purpose is to:
  - Simplify and Standardize Aero Engine supplier requirements through the removal of duplication and waste
  - Create a common language for Quality
  - Build on existing industry standards, where they exist
  - Create Requirements that are simple, prescriptive, and auditable
  - Promote the use of standardized 3rd party training
  - Deliver results with pace
  - Focus on effective deployment and improving the capability of the shared supply chains

# AESQ Strategy Group Members











## AESQ Members

Cincinnati Thermal Spray
Consolidated Precision Products
Meggitt PLC
Solar Atmospheres

# AESQ Strategy Group Members

Barbara Negroe
Executive Sourcing Quality Leader
**GE Aviation**

Lisa Claveloux
Sr. Director Quality
**Raytheon Technology Corp.**

Helen Djäknegren
Director Supplier Quality
& Development
**GKN Aerospace**

Uzam Khan
Supplier Quality Executive
**Rolls-Royce**

Emmanuel Vivier
VP Manufacturing & Supply
Chain Deputy
**Safran Aircraft Engines**

Jun Sakai
Chief Engineer
**IHI Corporation**

Barrie Hicklin
Sr. Director, Quality Systems
& Regulatory Compliance
**Honeywell**

Thomas Frank
Senior VP Corporate Quality
**MTU Aero Engines**

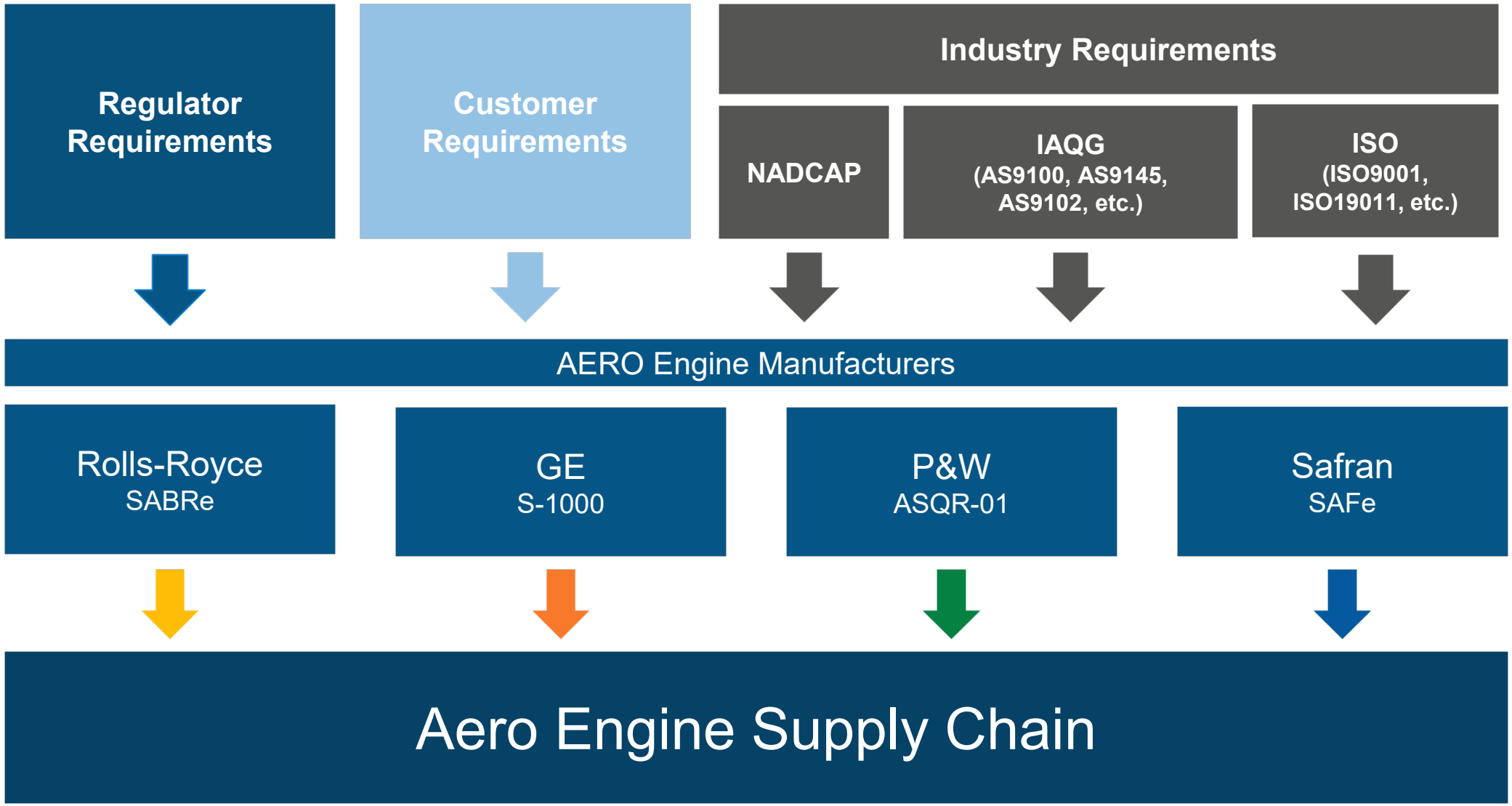
James Clifton
Global Quality Director
**Precision Castparts Corp.**

Osa Omoruyi
VP Quality
**Howmet Engine Systems**

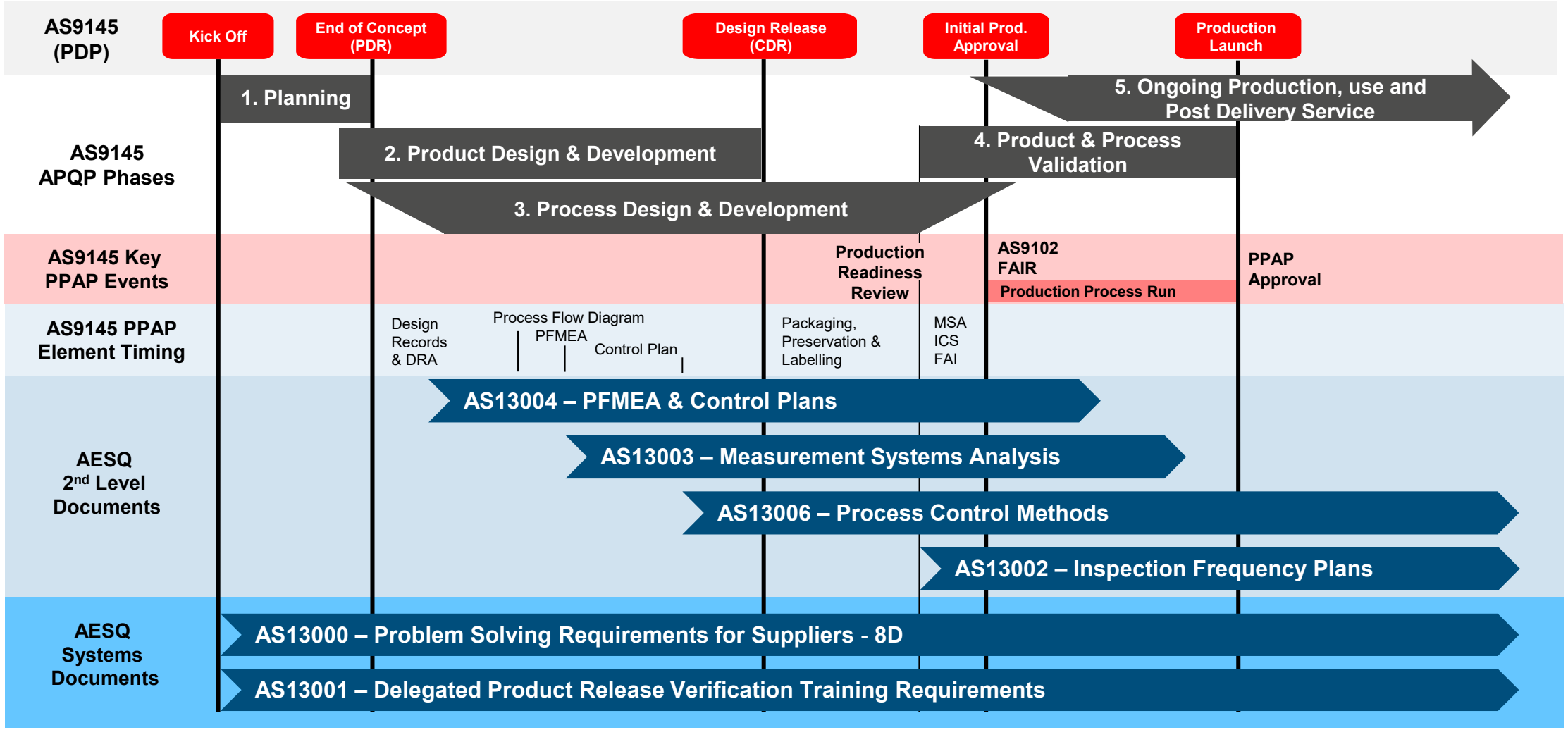
# AESQ Vision

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.

# Aero Industry Requirements Flowdown 2012



# Product Life Cycle & Current AESQ Document Interaction



# Example Best Practice Stories


Sam Suzhou make Engine Mounts

16 Part Specific FMEAs using AS13004 created in 3 months

PFMEA led to the Introduction of error proofing and prevention controls

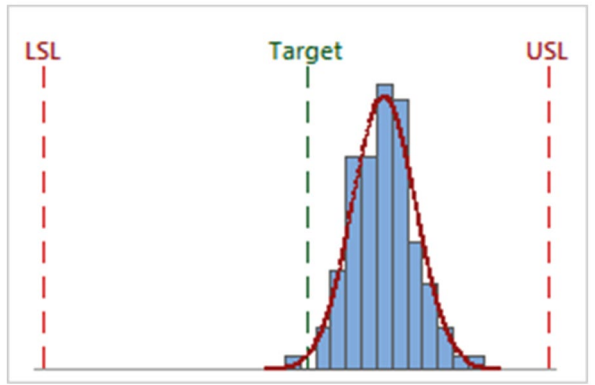
Defect Free since September 2017

Fan Case Delivered Defect Free at PPAP after applying AS13004, AS13003 and AS13006

70 consecutive parts now delivered Defect Free

Manufactured by GKN, Newington

PPAP completed in 6 months instead of the usual 18 months




IPT Turbine Blade machining using AS13006 Real Time SPC

98% of features Cpk >2, the other 2% Cpk >1.67

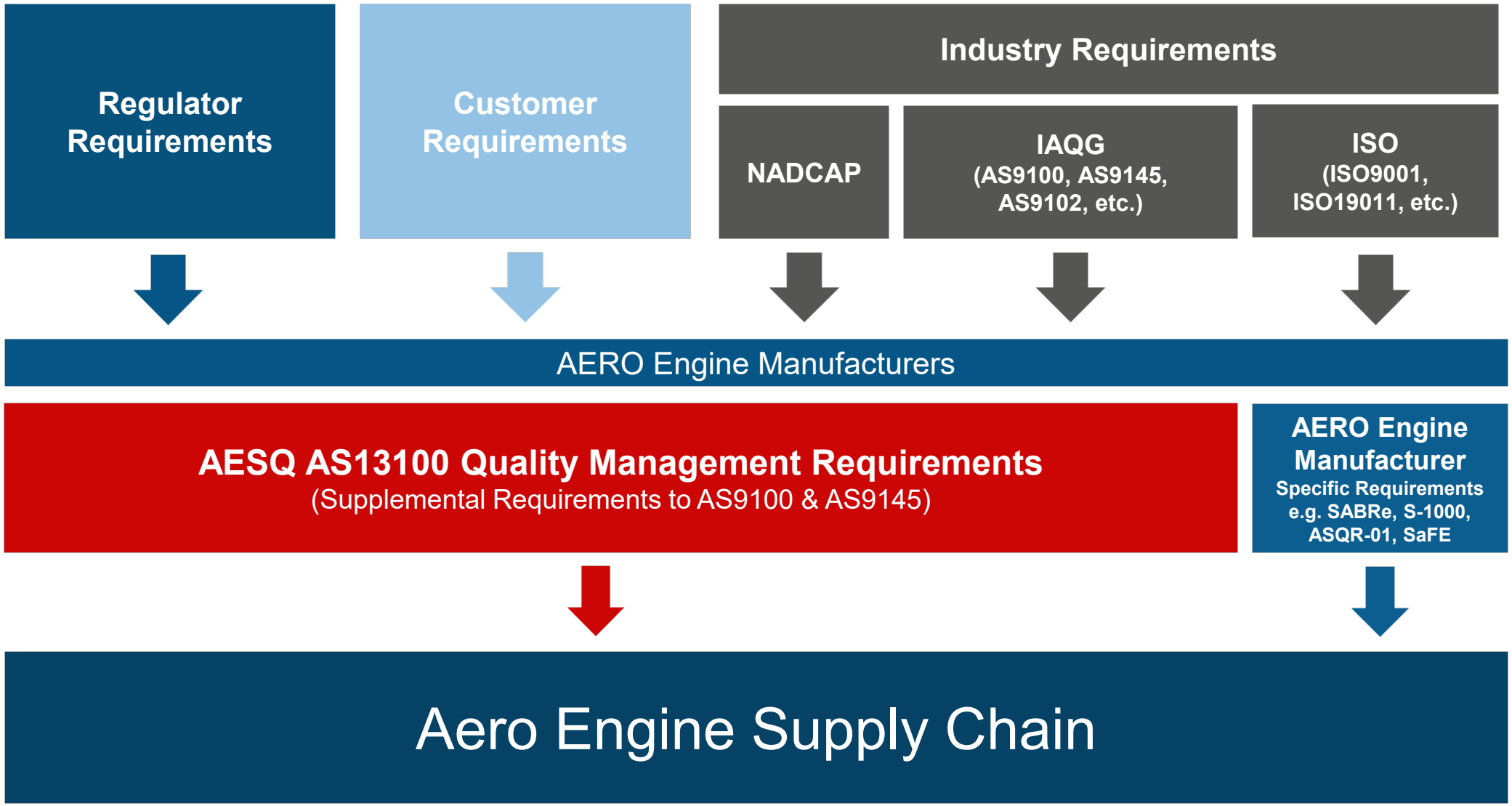
Zero Defect standard met since production start (5,000 blades)

# AS13100 OVERVIEW

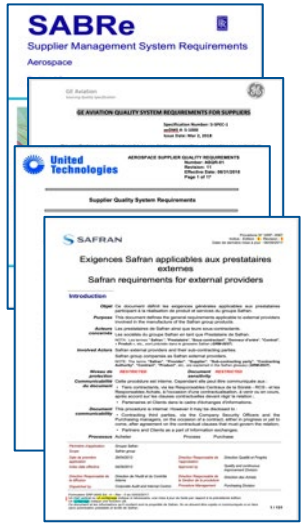
# STRUCTURE & KEY HIGHLIGHTS

**LARRY BENNETT**
CONSULTING ENGINEER, GLOBAL SOURCING QUALITY
SUPPLY CHAIN DIVISION
GE AVIATION

# Aero Industry Requirements Future Vision



# AS13100 Creation Process




Starting Point
September 2018

OEM Unique Requirements

Existing Engine Maker
Supplier Requirements

Harmonized Requirements



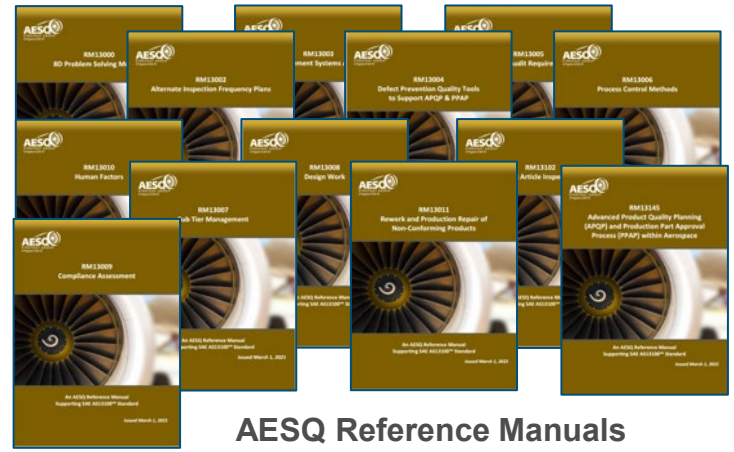
Future Engine Maker
Supplier Requirements

Overall Number of Requirements
reduced by >50%


Requirements

Existing & WIP
AESQ Standards

Supporting Guidance & Best Practice Material




AESQ Reference Manuals

# AS13100 Structure

| AS13100 Requirements | Chapter A AS9100 Rev D Supplemental Requirements | | | | | | | | | | Chapter B APQP & PPAP AS9145 Supplemental Requirements | | | | | | Chapter C Defect Prevention Quality Tools to Support APQP & PPAP | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clause Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 1 | 2 | 3 | 4 | 5 | 6 | DFMEA | Product KCs | Process Flow Diag. | PFMEA | Process KCs | Control Plan | MSA | Process Capability |

**Example Extract**

9.3 Management Review

9.3.1 General Reference 9100D:09/2016 requirements.

9.3.2 Reference 9100D:09/2016 requirements.

**9.3.2.1 Management Review Inputs - Supplemental Requirements**

**Management Reviews shall be conducted at least annually and consider the following performance topics:**

- **Cost of Poor Quality (COPQ).**
- **Manufacturing / Assembly Right First Time / First Pass Yield.**
- **Customer scorecards (where available).**
- **Human Factors reporting.**

# AS13100 Customer Specific Requirements


Designed to Include Customer Specific requirements that could not be harmonized within AS13100.

These documents shall:

- Require Compliance to AS13100
- Signpost to Customer Specific Documents (where required)
- Definition of customer specific acceptance thresholds called out in AS13100 e.g., Cpk, GR&R scope, etc.
- Additional Customer Specific requirements not defined within AS13100
- Defines company specific key roles and accountabilities for approvals
- Includes specific IT interface requirements

# AS13100 Requirement Highlights


## POLL QUESTION #2: Which organization type best describes your organization?

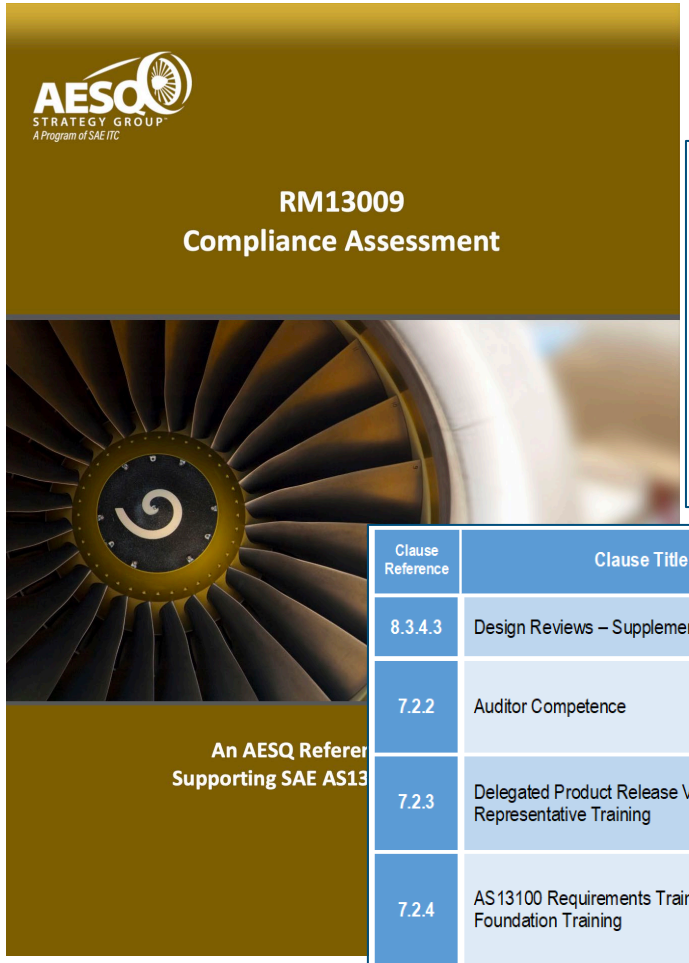
| AS13100 PARAGRAPH REFERENCE | ORGANIZATION TYPE | | | | | |
|---|---|---|---|---|---|---|
| | TYPE 1: MAKE TO PRINT | TYPE 2A: DESIGN AND MANUFACTURE | TYPE 2B: DESIGN ONLY | TYPE 3: DISTRIBUTOR | TYPE 4: SPECIAL PROCESS | TYPE 5: RAW MATERIAL |
| 4.3.1 | X | X | X | X | X | X |
| 4.3.2 | X | X | X | | | |
| 4.3.3 | X | X | X | X | X | X |
| 4.3.4 | X | X | X | X | X | X |
| 4.3.5 | X | X | X | X | X | X |
| 4.4.3 | X | X | X | X | X | X |
| 5.1.1.1 | X | X | X | X | X | X |
| 5.2.1.1 | X | X | X | X | X | X |
| 5.3.1 | X | X | X | X | X | X |
| 6.1.3 | X | X | X | X | X | X |
| 7.1.3.1 | X | X | X | X | X | X |
| 7.1.5.1.1 | X | X | | | X | |
| 7.1.5.1.2 | X | X | | | X | |
| 7.1.5.1.3 | X | X | | | X | |

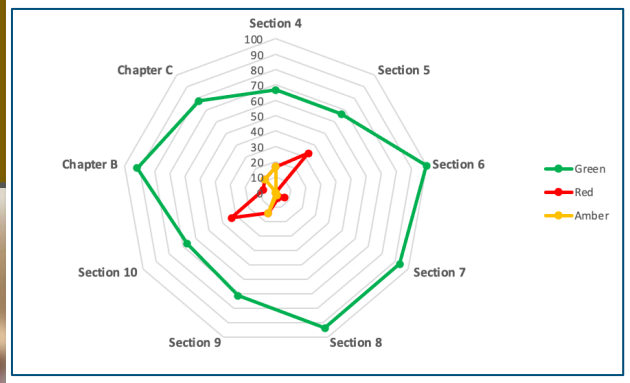
**Table 1** provides a guide to the applicability of AS13100 Sections to Organization scope.

| ORGANIZATION TYPE | QMS APPROVAL (MINIMUM REQUIREMENT) |
|---|---|
| **Type 1: Make to Print and Type 2A: Design and Manufacture.**<br>**Manufacture, inspect, test, and certify the conformance of semi-finished and/or finished products (installed on aerospace engines or a component of such a product) to proprietary engineering drawings whether customer design, or organization design.** | 9100 registration. |
| **Type 2B: Design only.**<br>**Contracted Design Responsible Organization / Partner / Supplier tasks Organizations.** | As defined by Customer's requirements. |
| **Type 3: Distributor.** | 9120 registration. |
| **Type 4: Special Process (2.3).**<br>**As part of an Organizations manufacturing scope and/or Special Process Houses.** | Nadcap or Customer's requirements. |
| **Type 5: Raw Material.**<br>**Manufacture, inspect, test, and certify the conformance of Raw Material to proprietary engineering specifications.** | ISO9001 registration. |
| **Production Shop Assist Only.**<br>**Offload of planned manufacturing operations.** | Per Organizations Requirements based upon scope of work, unless specified by the customer. |
| **External Calibration or Laboratory Service Provider.** | ISO / IEC 17025 or National Equivalent, e.g., UKAS, COFRAC, NIST. |
| **Industry Standard Part or Industry Standard Raw Material Manufacture.** | ISO9001 registration. |
| **Castings and Forgings produced to a proprietary design.** | 9100 registration. |

**Table 2** defines an agreed set of Certification Requirements, matched to the scope of the supplier's activities.

# AS13100 Requirement Highlights




| Clause Reference | Clause Title / Subject | Organization Process Reference (or comment) | Compliance Status |
|---|---|---|---|
| 8.3.4.3 | Design Reviews – Supplemental Planning | Not a Design responsible supplier | N/A |
| 7.2.2 | Auditor Competence | Auditor competence requirements are defined in our QMS in procedure number QP005, Rev D. This procedure fully complies with the requirements of AS13100 clause 7.2.2. | G |
| 7.2.3 | Delegated Product Release Verification (DPRV) Representative Training | All relevant inspection personnel are trained in accordance with this requirement. It is defined in our QMS in procedure number QP009, Rev B. | G |
| 7.2.4 | AS13100 Requirements Training & AESQ Quality Foundation Training | We have identified five personnel within the business that require this training. Their training plans / job profiles have been updated to reflect this as a mandated training. Training is scheduled for July (in 3 months time). | A |
| 7.3.1 | Human Factors Awareness | We do not have a Human Factors program at this time. The organization's leadership team are currently reviewing our future approach to HF. | R |

Section 4.3.5 requires the organization to conduct a **Compliance Assessment** of their QMS to ensure that it captures all of the requirements of AS13100 and customer specific requirements.

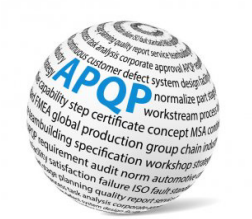
The results of this review are to be provided to the customer upon request.

Any compliance gaps must be highlighted to the individual customer and a resolution agreed.

Reference Manual RM13009 provides information to support this requirement.

# AS13100 Requirement Highlights

AS13100 Section 8.3 includes common Requirements for **Design & Development.** Key Supplemental Requirements include;




Specifies AS9145 APQP & PPAP for Managing New / Changed Product Designs


Defines Design FMEA approach to meet Design Risk Analysis requirement

Requires the use of Cross Functional Teams for Design & Development Activities


Defines requirements for Design for 'X'

(Manufacture, Assembly, Servicing, Disposal)

Specifies the use of AS9116 to manage Design Changes

## Reference Manual RM13008 Provides Guidance for Design Work

# AS13100 Requirement Highlights

AS13100 Section 8.4.1, 8.4.2 and 8.4.3 define the additional requirements for Supplier Evaluation, Selection, Control and Performance Monitoring.

Engineering & Manufacturing Capability


Quality Control Capabilities


Purchasing, Planning & Capacity


Commercial, Legal & Environmental


Supplier Register Maintenance


Product Acceptance


Supplier Surveillance

Supplier Performance Monitoring

## Reference Manual RM13007 Provides Guidance for Supplier Management

# AS13100 Benefits

1. **Single AESQ Standard aligned to AS9100 / ISO9001**
   - Less Requirements for the Supplier (>50% less)
   - Lower cost (suppliers do not need to buy multiple standards)
2. **Supported by Free Issue Reference Manual Guides**
3. **Will minimise the content of OEM Supplier Requirement Standards (SABRe, S-1000, ASQR-01 and SAFe)**
4. **Creates a common language for Quality, OEMs have adopted standard approaches within their own operations.**
5. **Aligns to relevant existing industry standards (ISO, AS9xxx, Nadcap, etc)**
6. **Supported by global approved training resources**
7. **Enables the AESQ OEMs to provide a harmonised approach to Supplier Development**
8. **Supplier Compliance continues to be assessed through Customer Audit**
9. **Allows AESQ to focus on Supply Chain Capability Development**

# AS13100 Core Writing Team: Thank you for sticking with it, every Wednesday, for two & a half years, even during the pandemic, to get it published.

**Dr Ian Riggs**
Rolls-Royce
Writing Team Leader

**Larry Bennett**
GE Aviation
Writing Team Deputy Leader

**Elizabeth Pace**
Raytheon

**Earl Capozzi**
Pratt & Whitney

**Jim Wilson**
Pratt & Whitney Canada

**Catherine Catarina-Graca**
Safran Aircraft Engines

**Paula Adkins**
Rolls-Royce

**Peter Amsden**
Pratt & Whitney

# Thank you to the 99 Subject Matter Experts who created the Reference Manuals

Aaron Stahl
Adam Rogers
Ake Winkvist
Andrew Stout
Anil Oenuer
Barrie Hicklin
Benoit Gottie
Björkälv Håkan
Brian Murphy
Carrie Sharkey
Catherine Belgacem
Catherine Catarina-Graca
Charles Barry
Chip Svoboda
Chris Bishop
Chris Craig
Dave Goldberg
Earl Capozzi
Ed Briggs
Erika Grimm
Frederic Vetil
Grant Braun
Helen Djäknegren
Hector Mata-Collado
Helmut Weitmann
Herelio Munoz-Morales
Ian Bentley
Ian Riggs
Inger Henström
James Kelly
Jim Barge
Jim Nelson
Jim Wilson
Jonas Nickel
John Calder
Jule Hegwood
Jun Sakai
Jun Teshima
Karen Scavotto
Karl Evans
Kristin Gantz
Larry Bennett
Lars Brander
Laura Hill
Lena Wendel Eckerbom
Lise Brox
Ludovic Chevet
Marc Boursicot
Marie Partridge
Marnie Ham
Mattias Eriksson
Maura Callahan
Melanie Deroo
Melanie Renault
Michael Cera
Michael Cosenza
Michael Fuehner
Michael Gerhmann
Michael Stock
Mike Cosenza
Nathalie Noblet
Nick Watling
Nicolas Reignier
Olivier Castets
Patrice Richen
Paul Gorg
Paul Hacker
Perr Rendell
Pete Bilbie
Pete Teti
Peter Papadopoulos
Phil Bamforth
Rebecca Lemon
Ricardo Banuelas
Rich DeMary
Richard Baker
Richard Bolingbrook
Rob Farndon
Robert Starcke
Roger Persson
Rudi Braunrieder
Simon Gough-Rundle
Song Gao
Stefan Gehring
Stefan Lund
Steve Christensen
Steven Finup
Susie Neal
Sverker Johnson
Thomas Herter
Thomas Schmitt
Tobias Kranz
Todd Angus
Tony Pailing
Vince Miller
Ward Baun
Wilibald Schoder
Wolfgang Wagner
Yvonne Mansson

# AS13100 Supporting Reference Manuals


AS13100 Standard defines mandated requirements.

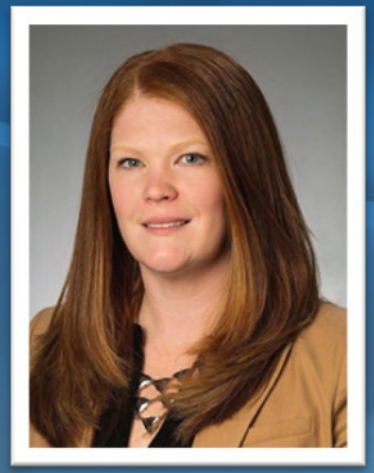
The Standard is supported by free issue Reference Manuals from the AESQ Website:

→ https://aesq.sae-itc.com/content/aesq-documents

Reference Manuals provide industry best practice guidance and case study material on how to deploy quality tools effectively.

Reference Manuals are maintained and updated by the **AESQ Subject Matter Interest Groups** and may be updated at any time when new or revised information becomes available

# AS13100 DEPLOYMENT INTRODUCTION & MILESTONES



**ELIZABETH PACE**
ASSOCIATE DIRECTOR, SUPPLIER QUALITY
RAYTHEON TECHNOLOGIES

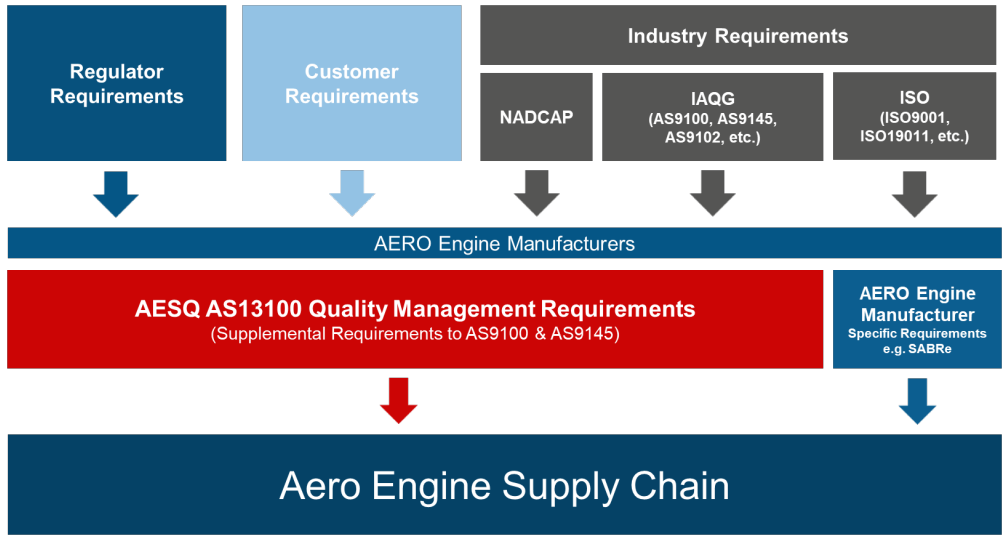
# AESQ Released AS13100

A standard establishing supplemental requirements for 9100 and 9145 and applying to any organization receiving it as part of a Purchase Order or other contractual document

Released March 1, 2021 with a compliance date of December 31, 2022

AS13100 leverages the Reference Materials (RM13xxx) developed by the SAE G-22 AESQ committee over the last few years


# Benefits of collaboration




**Create a common language for Quality in the Aero Engine Supply Chain**

**Simplification of standards**

a) Removal of duplicate / redundant requirements

b) Builds on existing Aerospace Industry Standards where appropriate

**Setting higher standards for Quality**

a) Adopt best practice from across industry

b) Standards written by industry practitioners

c) Challenging current acceptance thresholds – "raising the bar of quality performance'

**Acceleration of Supplier Quality Capability Improvement**

a) Aligned Supplier Development activities using Common Quality Tools

b) Availability of Global training and consultancy providers aligned to AESQ requirements

# Committed to AS13100 Compliance on December 31, 2022

AESQ STRATEGY GROUP
A Program of SAE ITC

GE Aviation

Pratt & Whitney
A United Technologies Company

ROLLS ROYCE

SAFRAN
AIRCRAFT ENGINES

Honeywell
Aerospace

MTU
Aero Engines

GKN AEROSPACE

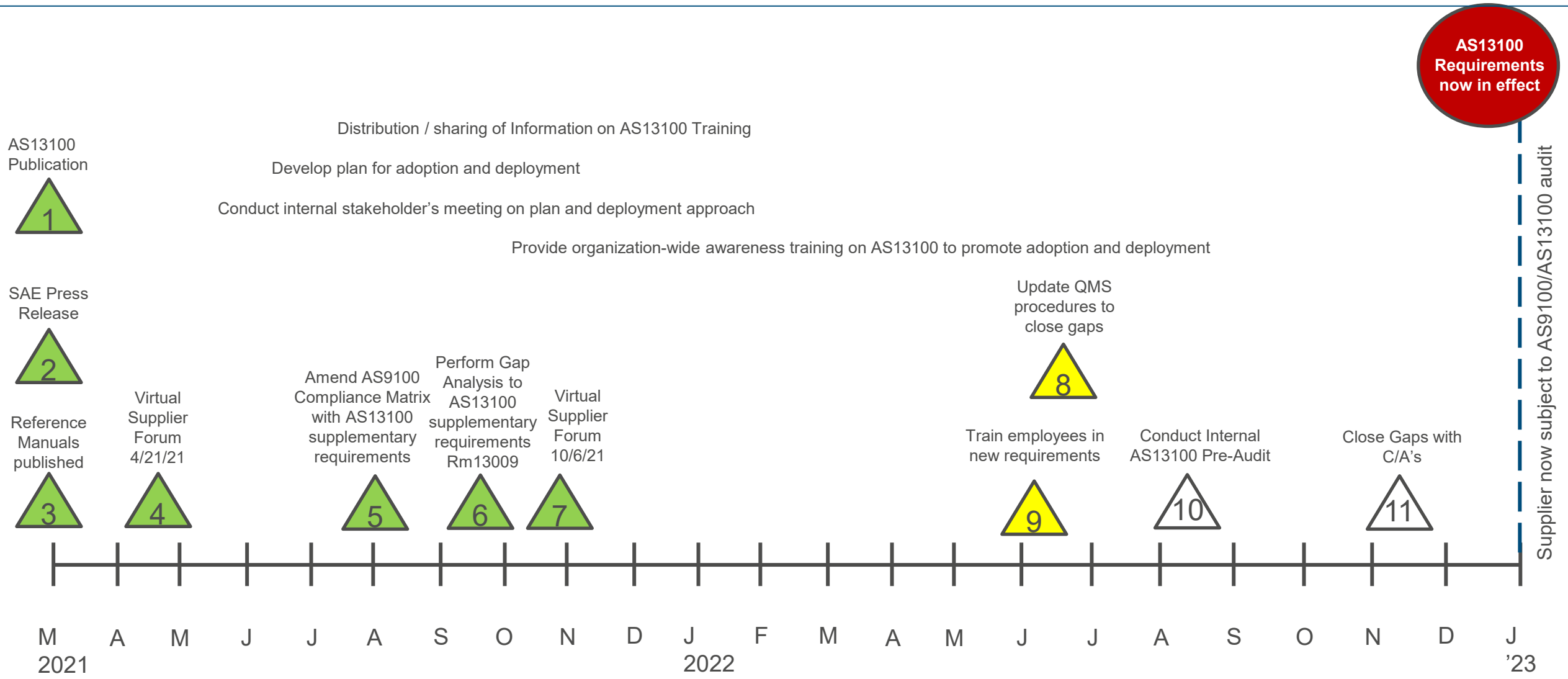
PCC Structurals, Inc.

HOWMET AEROSPACE

IHI

# AS13100 Supplier Preparation Milestone Plan

## Key milestones to achieve compliance to AS13100 by 12/31/2022



# IHI DEPLOYMENT

**HIROSHI YAMAMOTO**
GENERAL MANAGER, QUALITY SYSTEM DEPT.
IHI CORP.

# 1. Company profile of IHI Corporation

Year of establishment
1853

Number of employees (consolidated)
29,149

Overseas representative offices
14

Capital
107.1 billion yen
(8.3 million dollars converted to 115 yen per dollar)

Works
6

Affiliated companies in Japan
63
[Subsidiaries: 46 Affiliates: 17]

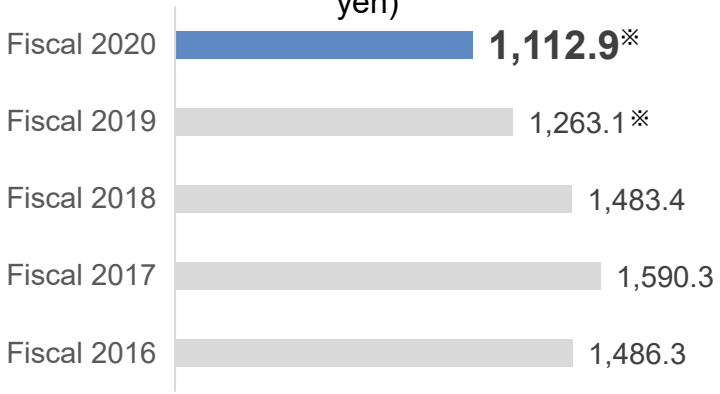
Revenue(Consolidated)
1,112.9 billion yen
(fiscal 2020)
(8.6 billion dollars converted to 115 yen per dollar)

Branches in Japan
8

Overseas affiliates
143
[Subsidiaries: 121 Affiliates: 22 ]

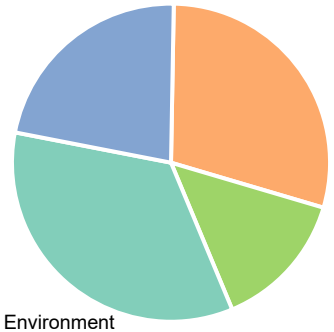
## Net sales/Revenue

Consolidated net sales/sales revenue (billions of yen)




※ IHI adopted International Financial Reporting Standards (IFRS) from fiscal 2020, showing sales based on those sales from fiscal 2019.

## Revenue Compostitions by business areas (Consolidated/fiscal 2020)



| | |
|---|---|
| Resources, Energy & Environment | 29% |
| Social Infrastructure & Offshore Facilities | 14% |
| Industrial Systems and General-Purpose Machinery | 34% |
| Aero Engine, Space & Defense | 22% |

Note : The total may not be 100% owing to the exclusion of "Other" and "Adjustments".

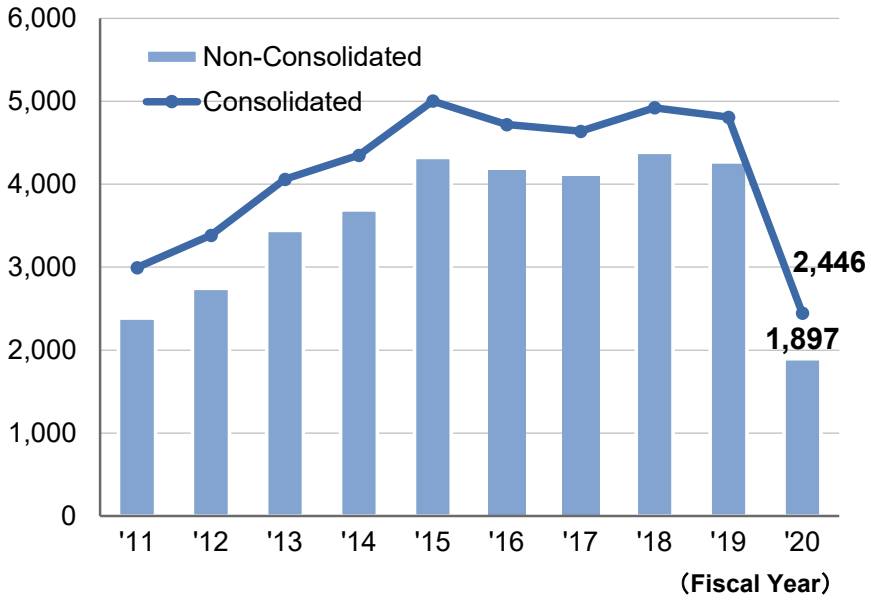
# 2. Profile of Aero-Engine, Space & Defense Business Area

| | | |
|---|---|---|
| **President of Business Area** | | **Hideo Morita**<br>**Managing Executive Officer** |
| **Employees (as of March 31, 2021)** | **(consolidated)** | 6,765 |
| | **(non-consolidated)** | 4,212 |

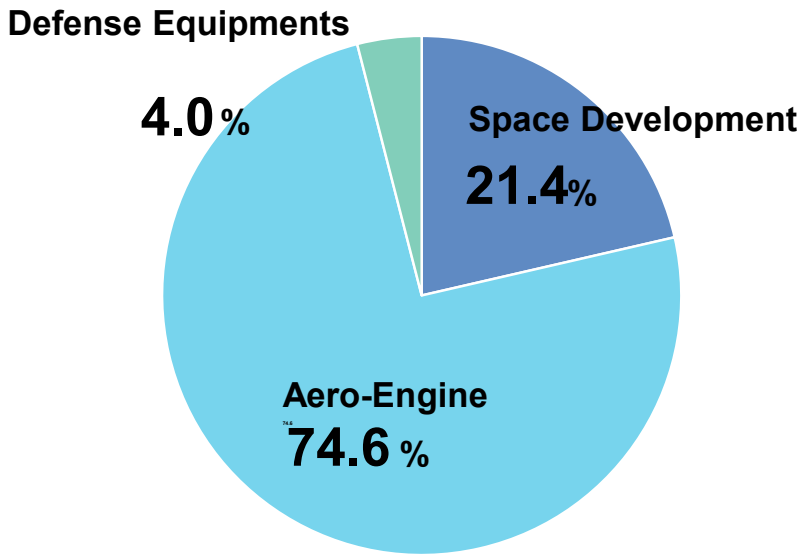
| | |
|---|---|
| **Operation divisions** | ● Defense Systems Div.<br>● Civil Aero-Engine Div.<br>● Space Development Dept.<br>● Research & Engineering Div.<br>● Manufacturing Div.<br>● Life Cycle Solution Div. |

## Annual Sales (Unit：100 million yen)

(780 thousand dollars converted to 115 yen per dollar)

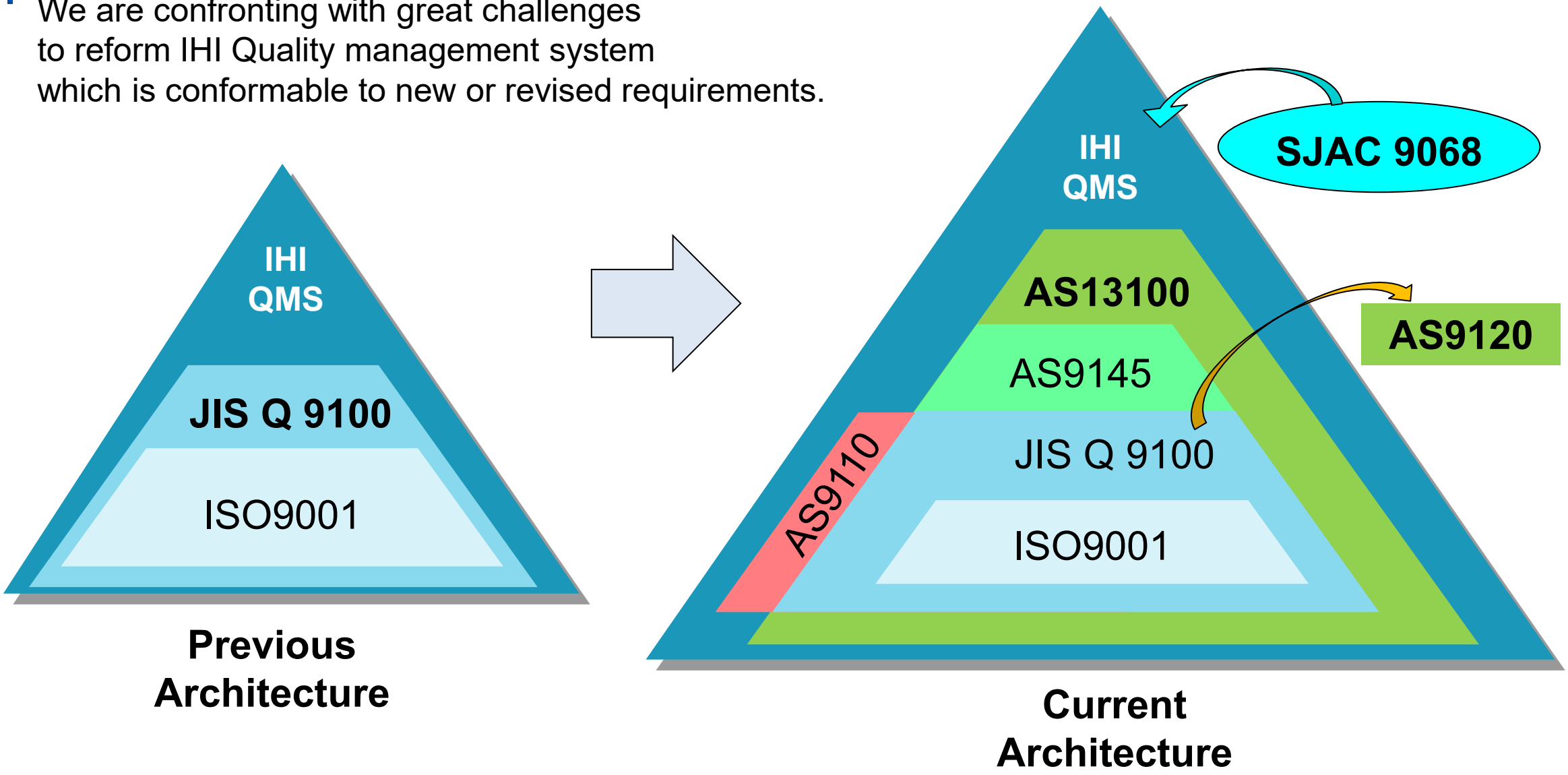



## Consolidated Sales Ratio (In fiscal 2020)



# 3. IHI Quality Management System Architecture

We are confronting with great challenges
to reform IHI Quality management system
which is conformable to new or revised requirements.

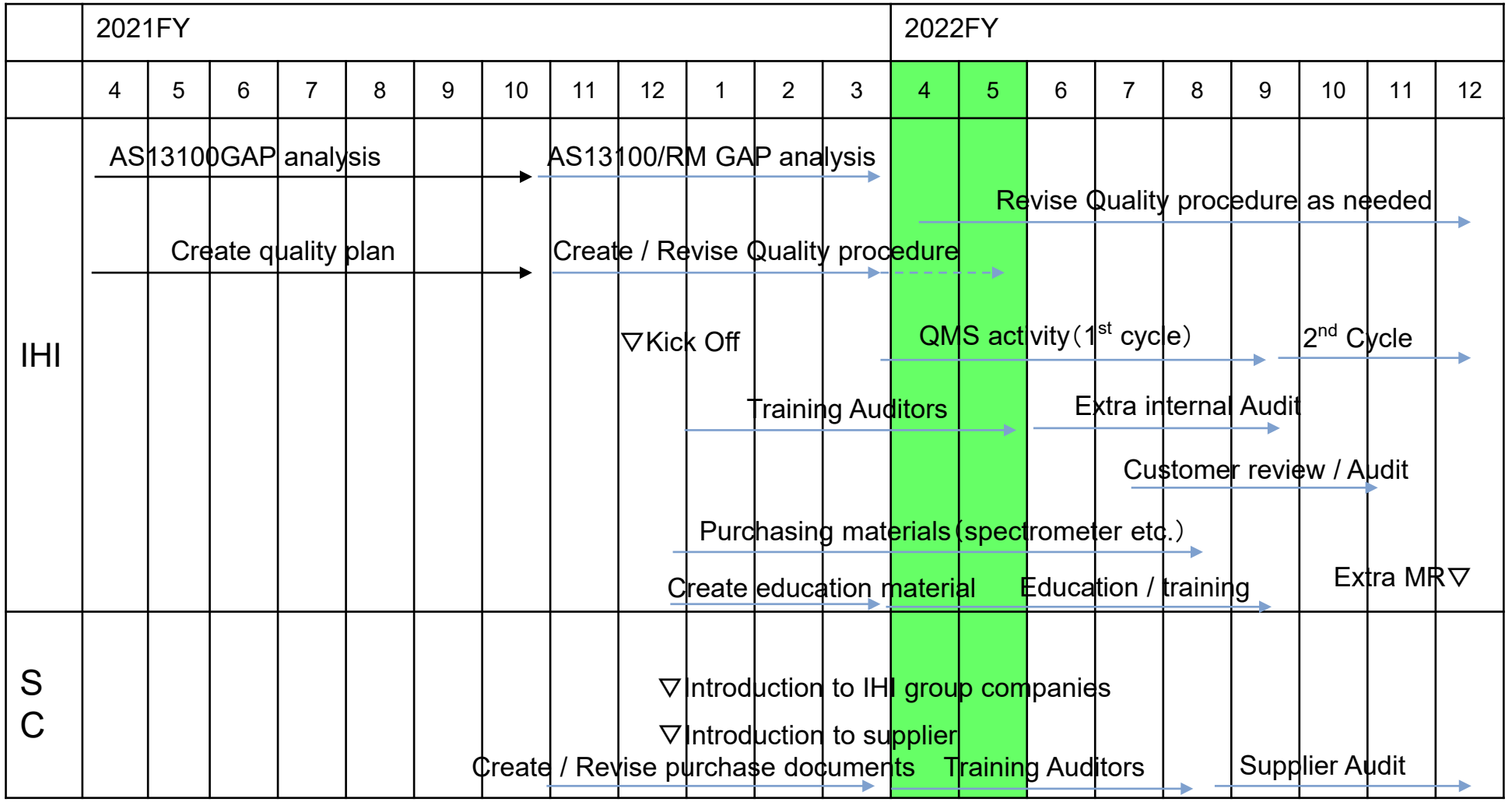


# 4. Deployment Strategy Group dashboard


| Milestones |
|---|
| Milestone 7: AS13100 compliance by supply base |
| Milestone 6: Training plan executed to supply base |
| Milestone 5: Training plan executed internally |
| Milestone 4b: Flow down of the Standard to the supply base. |
| Milestone 4: Communication plan executed to supply base. |
| Milestone 3: Communication plan executed internally. |
| Milestone 2: Project Plan Identified and Approved by Member Executive. (All have committed to deployment of Dec 2022 but plan to get there can vary.) |
| Milestone 1: GAP analysis being conducted. Member company committed to deployment by Dec 2022. |

We have reached Milestone 4 so far.
We are aiming for completing remaining milestones by the end of this year.

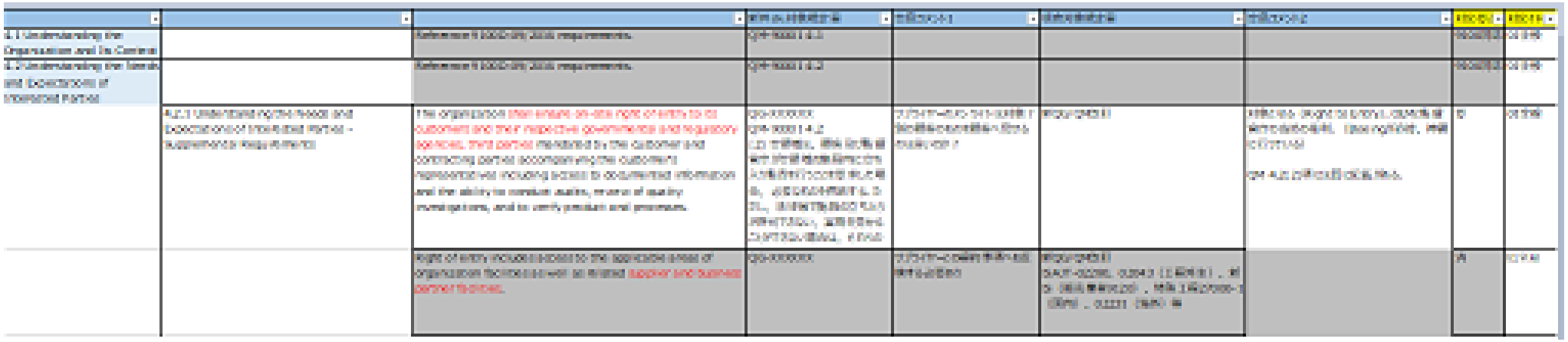
# 5. AS13100 Deployment schedule




We plan AS13100 deployment schedule for internal and supplier, respectively.

# 6. AS13100 Gap analysis

(Excerpt of AS13100 Gap analysis)



(AS13100 Requirement)

(Primary Gap analysis)

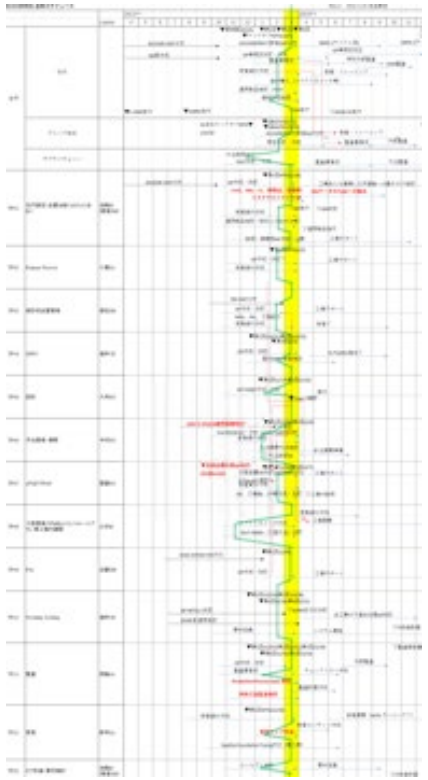
(To be verified by each task team to clarify what kind of action we have)

The result of AS13100 Gap analysis has been verified by each task team in order to revise or create internal procedures related to AS13100.

# 7. AS13100 Deployment strategy

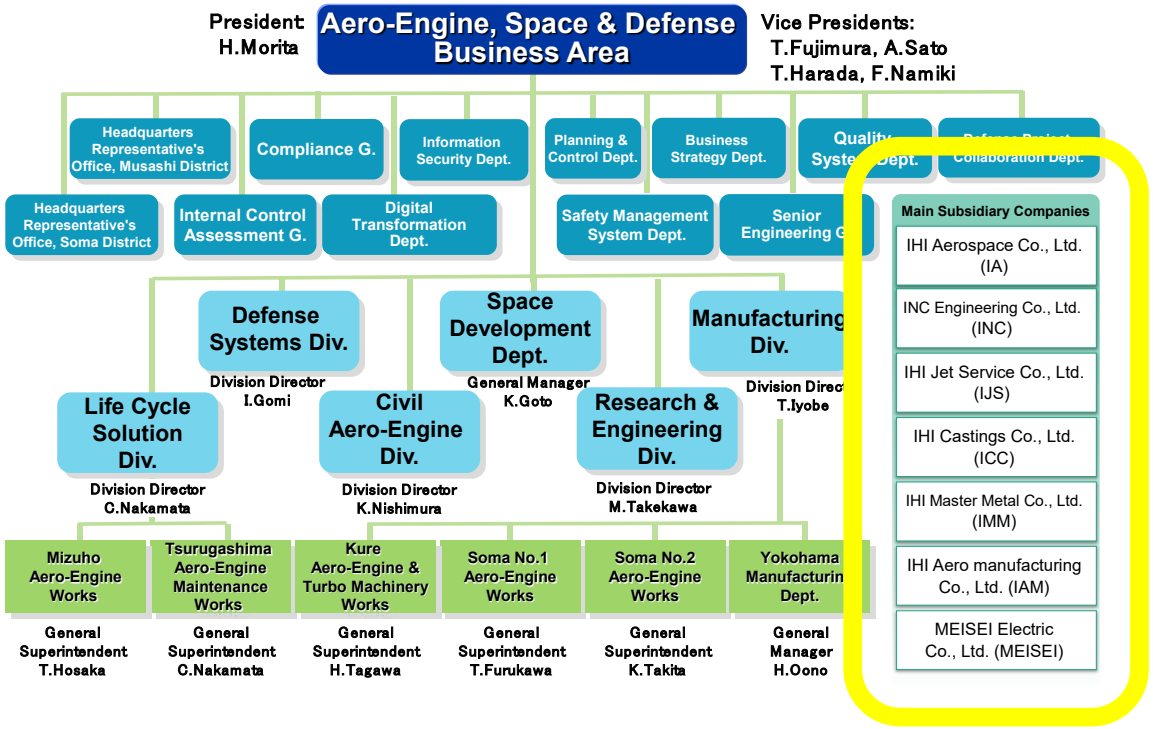
We are organizing a team and promoting the creation of IHI quality management system based on AS13100 Requirement.

| Team No. | Role |
|---|---|
| TF01 | General, Internal procedure |
| TF02 | Human factors |
| TF03 | Statistical quality control |
| TF04 | DPRV |
| TF05 | Design |
| TF06 | Supplier control |
| TF07 | APQP/PPAP |
| TF08 | Process control / PFMEA / control plan |
| TF09 | FAI |
| TF10 | Problem solving |
| TF11 | Audit |
| TF21 | Education |
| TF22 | Information and communication technology |



Each progress
has been Monitored monthly

# 8. AS13100 requirement flow down




**Introduction to IHI group companies**

**Applicability Table 1 and Gap analysis**

**Regular contacts with IHI group companies**

We have been communicating with main subsidiary companies about AS13100 deployment status each other regularly.

IHI

Realize your dreams

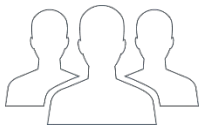
# MTU DEPLOYMENT

**MICHAEL MROSEWSKI**
QUALITY MANAGEMENT PROGRAMS
MTU AERO ENGINES


# AS13100 Implementation Plan @ MTU

MTU AERO ENGINES AG – Michael Mrosewski

# AS13100 Implementation Project Organization



## Steering Committee

Every 2 Months

**Quality (Systems, Inhouse production, supply chain)**

Extended: Engineering, Quality inspection, Production

## Project leader

**Quality**

Every 2 Weeks

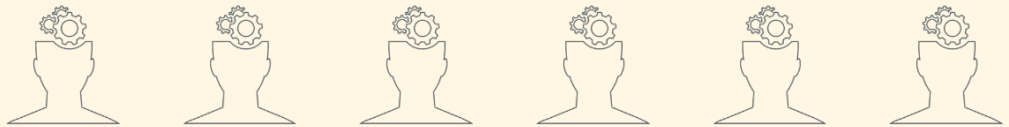
## Core Team Members

Design, Procurement, Production, Program office, …

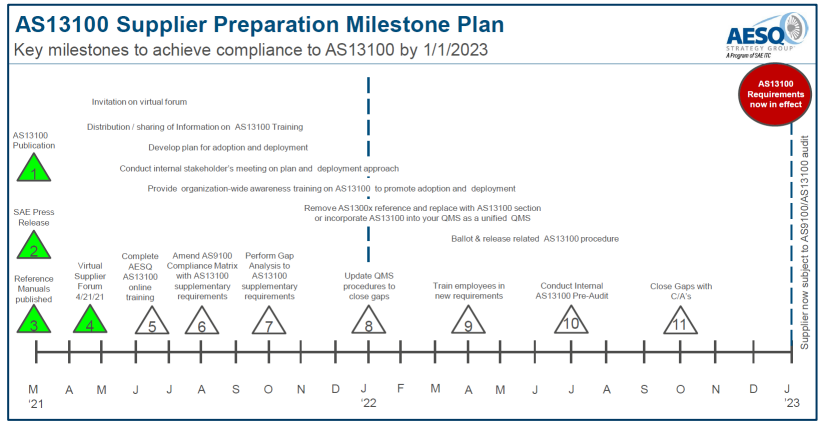
➔ Core team is extended where needed, depending on the relevant topics.

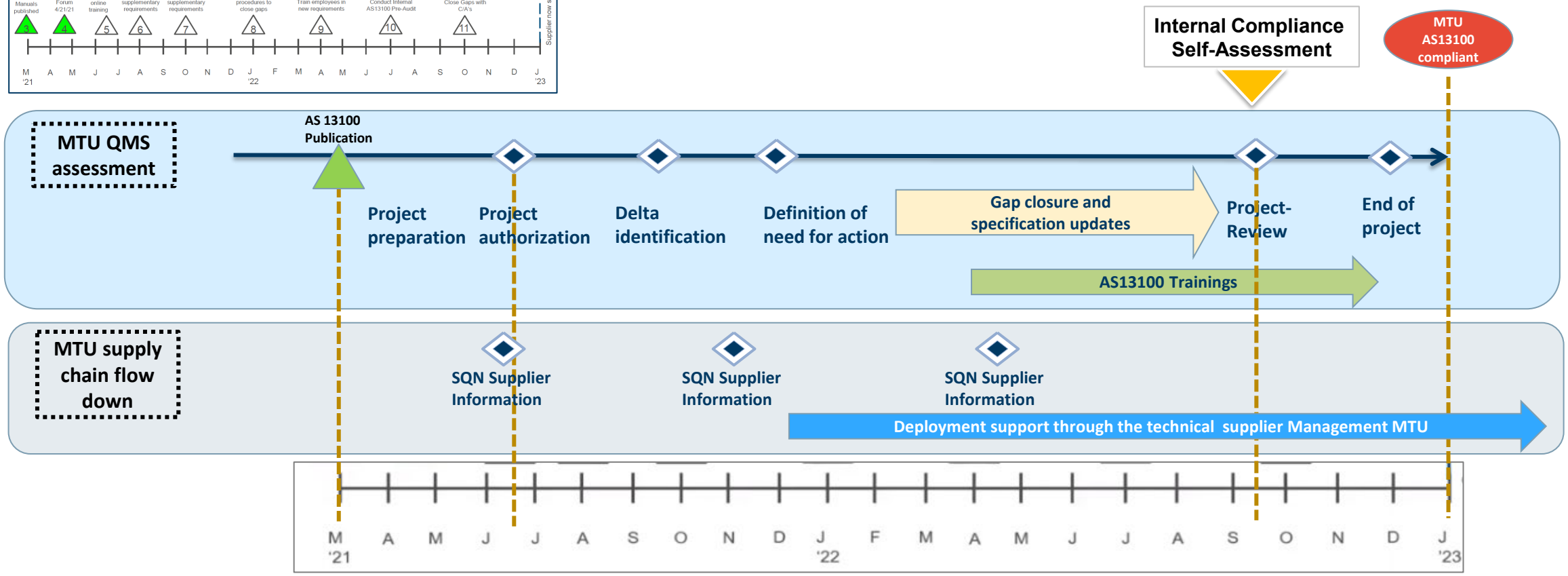
Core team

**Experts in Content** Core Team is supported by experts in content as required



# Project plan to achieve AS13100 compliance by January 1st 2023



# MTU Assessment of the AS13100 requirements

RM13009

**AS13100 Compliance Self Assessment Chapter A**

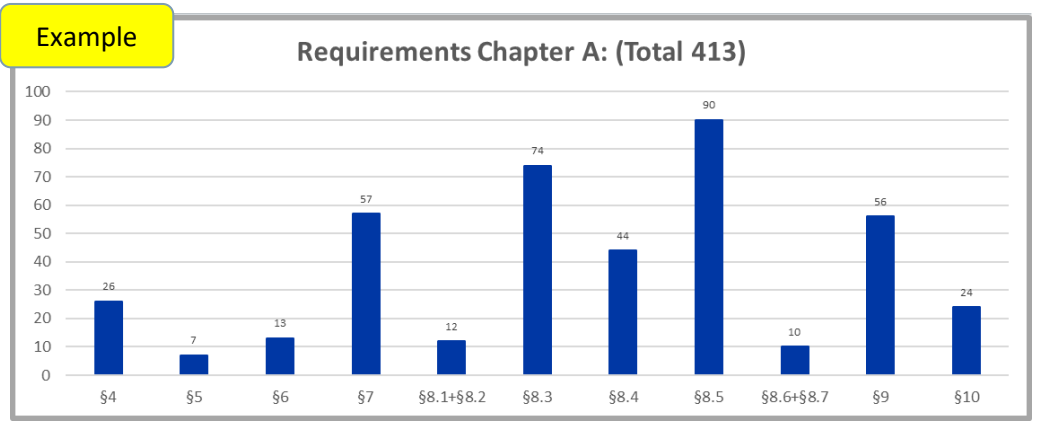
| Organization Name: | MTU Aero Engines | Date: | |
|---|---|---|---|
| Completed By: | | Version: | |

Self Assessment Compliance Status Key

- Not Complaint with the requirement. No Plan in place to resolve.
- Not compliant but there is a plan in place with a scheduled completion date
- Fully compliant to all points identified under each clause and referenced in the Management System
- Not applicable to the scope of activity carried out.

| Clause | Clause Title | Organization Process Reference (or comment) | Compliance Status |
|---|---|---|---|
| **Chapter A - Quality Management System Requirements** | | | |
| 4 | CONTEXT OF THE ORGANISATION | | |
| 4.2.1 | Understanding the needs and expectations of Interested Parties - Supplemental Requirements | | |
| 4.3.1 | Determining the scope of the quality management system - Supplemental Requirements | | |

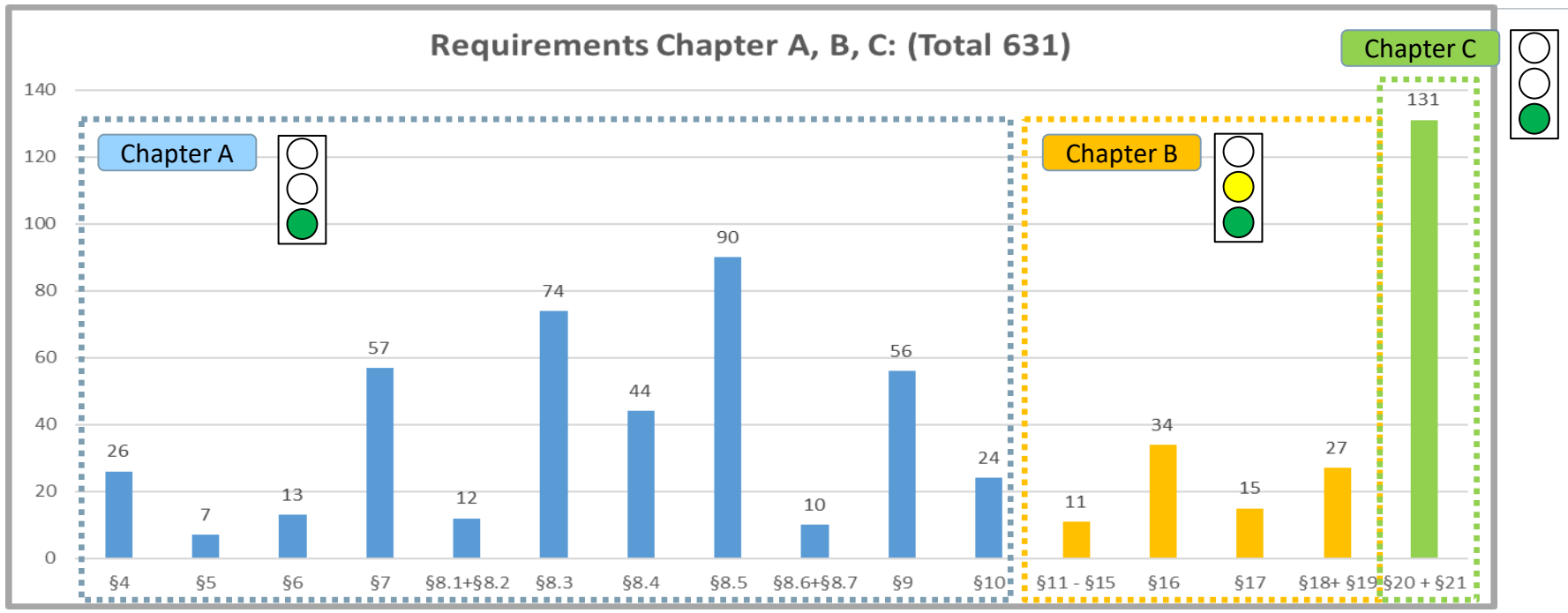
Example




Example

| AS13100 Requirement | Responsible Project Key Account | Responsible Expert | MTU Standard | PROJECT START AS13100 fulfilled? (yes/partly/no) | Necessary Action | Responsible Person | Due date | PROJECT END AS13100 fulfilled? (yes/no) |
|---|---|---|---|---|---|---|---|---|
| **4. CONTEXT OF ORGANIZATION** | | | N/A | | | | | |
| **4.2.1 Understanding the Needs and Expectations of Interested Parties - Supplemental Requirements** | | | N/A | | | | | |
| The organization shall ensure on-site right of entry to its customers and their respective governmental and regulatory agencies, third parties mandated by the customer and contracting parties accompanying the customer's representatives including access to documented information and the ability to conduct audits, review of quality investigations, and to verify product and processes. | | | | **yes** | | | | **yes** |
| Right of entry includes access to the applicable areas of organization facilities as well as related supplier and business partner facilities. | | | | **yes** | | | | **yes** |

# Implementation Status and next steps




**Achievements and Challenges**

- Chapter A & C: Requirements allocated to MTU standards and processes. Actions are defined.
- Chapter B: APQP implementation requires definition and transfer into new processes.
- Supplier Flow Down established and communication about the implementation status

**Next steps**

- Complete action plan as defined
- AS13100 training of the MTU organization to establish the new standard
- Close contact to the supply base to support deployment and evaluation of the implementation status

# SAFRAN AIRCRAFT ENGINES DEPLOYMENT

**CATHERINE CATARINA-GRACA**
SUPPLIER MANAGEMENT SYSTEM COORDINATOR
SAFRAN AIRCRAFT ENGINES

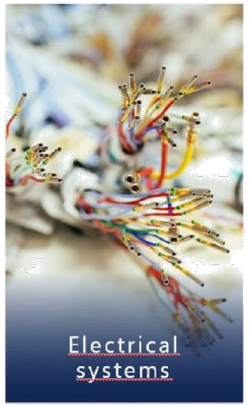
# Safran, a world leader in aerospace

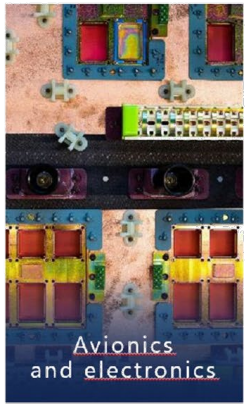
SAFRAN

# SAFRAN GROUP Activities

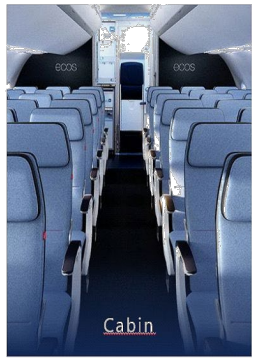
**Aircraft propulsion:** proven innovation and reliability to support aircraft manufacturers and airlines

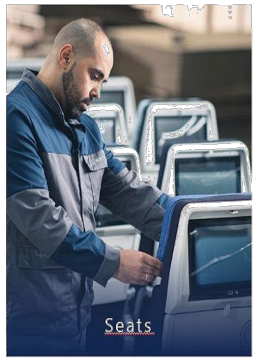

**Aircraft equipment:** a complete range of products and services





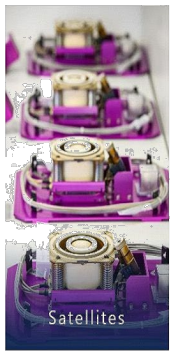

**Aircraft interiors:** an extended range for all types of aircraft to enhance passenger comfort






**Defense:** protecting citizens through technology


**Space:** state-of-the-art technologies to drive progress




* through ArianeGroup, a 50/50 joint company between Safran and Airbus, and its Arianespace subsidiary

# SAFe : A Safran Project

SAFe = A « ONE SAFRAN » project

ONE AMBITION
ONE BRAND
ONE PERFORMANCE
One Safran

SAFe = 3 main documents

- ❑ SAFe 2020 issued Dec 2020
- ❑ One Safran Company leads the deployment for the whole group

**GRP-0087**
Procedure of quality requirements for external providers including CSR charter

**GRM-0123**
Provider Handbook

**GRF-0033**
Compliance matrix to requirements

- ❑ Activity Sector
- ❑ Activity Type

| Code | Activity Sector label |
|---|---|
| S1 | Civil & Military engines |
| S2 | Civil & Military aviation and space equipment and systems Unmanned aerial vehicles (UAVs) |
| S3 | Cabin / Seats |
| S4 | Non-aeronautical defense |
| S5 | Automotive / Railway |
| S6 | Other sectors |

| Code | Activity type label |
|---|---|
| A | Build-to-print Provider |
| B | Build-to-spec Provider |
| C | Dealer, Stockist, distributor, |
| D | Aeronautical maintenance service Provider |
| E | Non production service Provider |
| F | Production Interoperations Service Provider |
| G | Manufacturer of catalog parts, Standard, Standardized (COTS) |



SAFRAN

# Statements

**AS13100 issued March 2021**

AS13100 will be flown down **to Only S1 Suppliers**.

Few Safran companies are concerned :
mainly **Safran Aircraft Engines**

**SAFe won't Be modified before 2024 to prevent mixing messages -> Supply Chain**

**On Going Project since June 2021**

# Safran Aircraft Engines Deployment

| Milestones |
| --- |

**Milestone 1:** GAP analysis being conducted. Member company committed to deployment by Dec 2022.

**Milestone 2**: Project Plan Identified and Approved by Member Executive.

**Milestone 3**:Communication plan executed internally

**Milestone 4:** Communication plan executed to supply base.

**Milestone 5**: Training plan executed internally

**Milestone 6:** Training plan executed to supply base

**Milestone 7:** AS13100 Flowed to supply base in accordance with Company plan

# Safran Aircraft Engines Deployment - **MILESTONE 1**

**1.GAP Aircraft Engines**

- **Review RM13009 for SAFRAN Aircraft Engines : Internally**
- **Answer as supplier**
- **Review main difficulties**
- **AS13100 learning curves for those involved in GAP analysis**

**2.GAP with SAFe**

- **Identify Supplemental requirements SAFe→ RM13009**
- **Identify Supplemental Requirements RM13009 → SAFe**

**3. Gap with suppl. Rqt with Aircraft Engines**

- **Identify Safran Aircraft Engines specific supplemental requirements → RM13009**

# Safran Aircraft Engines - **MILESTONE 1 –** GAP with SAFe

C2 - Restricted

## Measure GRP-0087 vs AS13100 – CHAPTER A

This page show AS13100 additional requirements not in SAFe :

Example 1 :

| | | |
|---|---|---|
| 7.1.3.1 | The organization shall use a cross-functional approach to develop project plans when implementing new plant, facilities, or equipment. | MORE AS13100 |

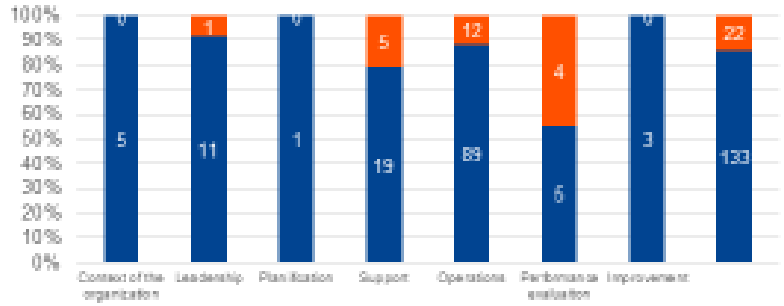
Example 2 :

| | | |
|---|---|---|
| 8.3.2.3 | The organization shall configure and plan Design Reviews appropriate to the project considering magnitude, complexity, novelty, risk, etc., (8.3.4.3) and include those milestone dates in the design and development plan. | MORE AS13100 (some elements in §8.3.2a + Chapter 12 GRP-0087 + GRM-0123) |

**Strictly More AS13100**
**Fuller in AS13100**

**133 SAFe requirements common**

**22 AS13100 additional requirements (to be reviewed)**




24 Safran – March 2nd, 2022 - Quality Committee

Ce document et les informations qu'il contient sont la propriété de Safran. Il ne doivent pas être copiés ni communiqués à un tiers sans l'autorisation préalable et écrite de Safran.

SAFRAN

## Chapter B :

**APQP: Few GAPS**
**Action Plan launched and finalized**

## Measure GRP-0087 vs AS13100 - CHAPTER A

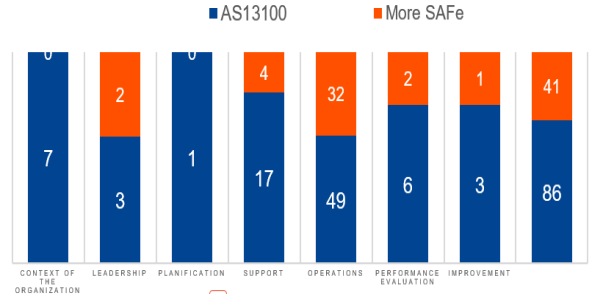
This page show SAFe additional requirements that are not included in AS13100 :

Example :

| | | | |
|---|---|---|---|
| 5.1.1e | The Provider's commitment on these two items shall be formalized through the signing of Safran's Charter for Responsible Purchasing (document available onto Safran's Website under the reference GRF-0164).<br>The Provider shall also initiate the invoices dematerialization to eliminate paper invoices. It shall use a structured format such as "Electronic Data Interexchange" (EDI). | A | MORE SAFe |

**86 common AS13100 requirements (represented by " AS13100"**

**41 additional SAFe requirements (represented by " More SAFe"**








SAFRAN

# **MILESTONE 1 –** GAP with SAFe - EXAMPLES

Section 7.2.1 Requires organizations to provide **On the Job Training** that includes;

- customer requirements,
- Internal requirements
- regulatory requirements

This requirement also applies to contract and agency personnel.

Persons whose work can directly affect quality shall be informed about the consequences on nonconformance to the customer.

Section 7.2.2 defines the **Auditor Competence Requirements** including;

- Qualifications
- Experience
- Maintenance (Ongoing professional development)

**RM13005** will provide further details.


Section 7.2.4 requires the organization to ensure that Quality Leaders attend the AS13100 Requirements on-line course and the AESQ **Quality Foundation Training Course**. The course includes training in;

- Applicable Regulations
- Customer Requirements
- APQP & Process Control Quality Tools

This course is also recommended for other key personnel.

AS13100 defines the requirements for **Supplier Evaluation, Selection, Control** and **Performance Monitoring.**

(Section 8.4.1)

NEW

The organization shall verify that the correct metallic raw material is used e.g. through the use of **hand held spectrometry.**

(Section 8.5.1.4.1)





SAFRAN

# Safran Aircraft Engines - **MILESTONE 1 – SAME AS SAFE**- EXAMPLES


Organization's are required to include **Human Factors** within the scope of their QMS

(Section 4.4.3, 5.1.1.1, 5.2.1.1 and 7.3.1)

**Chapter B**

**APQP**

**PPAP**

Defines the use of **8D Problem Solving** for customer escapes.


Compliance to **AS9146 FOD Prevention**

# Safran Aircraft Engines – **MILESTONE 1 TO MILESTONE 4**


Section 4.3.5 requires the organization to conduct a **Compliance Assessment** of their QMS to ensure that it captures all of the requirements of AS13100 and customer specific requirements.

The results of this review are to be provided to the customer upon request.

Any compliance gaps must be highlighted to the individual customer and a resolution agreed.

Reference Manual RM13009 provides information to support this requirement.

GRF-0033
Compliance matrix to SAFe requirements

**SAFe Compliance Matrix already exists:**

**Part of communication kit is : comparison of these 2 excel files:**

- **If SAFe Matrix is completed → Excel file with missing requirements to fullfill AS13100**
- **If RM13009 is completed → Excel file with missing requirements to fullfill SAFe**

# Safran Aircraft Engines Deployment - **MILESTONE 2 ; 3 AND 4**

**Milestone 2**
Project Plan…Member Executive.

- Approved June 29th 2021

**Milestone 3:**
Comm. plan internally

- In process For **main actors**; Communication preparation in process for whole « players » / all company → **OBJ 3rd Trimester 2022**
- Communication / training has been launched with main actors

**Milestone 4:**
Commun. Plan to supply base

- Communication preparation In Process : Few GAPs with our requirements – Training / Tools / communication KITs done for SAFe are common to AS13100 messages - Finishing Gaps with other Safran Aircraft Engines requirements -- > **OBJ Second Trimester**

# Safran Aircraft Engines Deployment - **MILESTONE 5 ; 6 AND 7**

**Milestone 5**
Training plan executed internally

- Allready started with main Actors but will be extanded during Summer 2022

**Milestone 6:**
Training plan executed to supply base

- Starts September 2022

**Milestone 7:**
AS13100 flow down to supply chain

- Will be flown down Summer 2022 with communication Kit and equivalences with SAFe / Safran Aircraft Engines specific requirements → Saves Time

# PRATT & WHITNEY DEPLOYMENT

**PAUL MORGAN**
SR. DIRECTOR QUALITY & PROCESSING ENGINEERING
PRATT & WHITNEY

# TRANSITION OF ASQR-01 -> AS130XX

## ASQR JOURNEY HAS PROGRESSED, AND NOW IF INFLUENCED BY AS13100

**ASQR-01 Rev 9, 2/2/2015**
AS13000 – Problem Solving Requirements for Suppliers - 8D

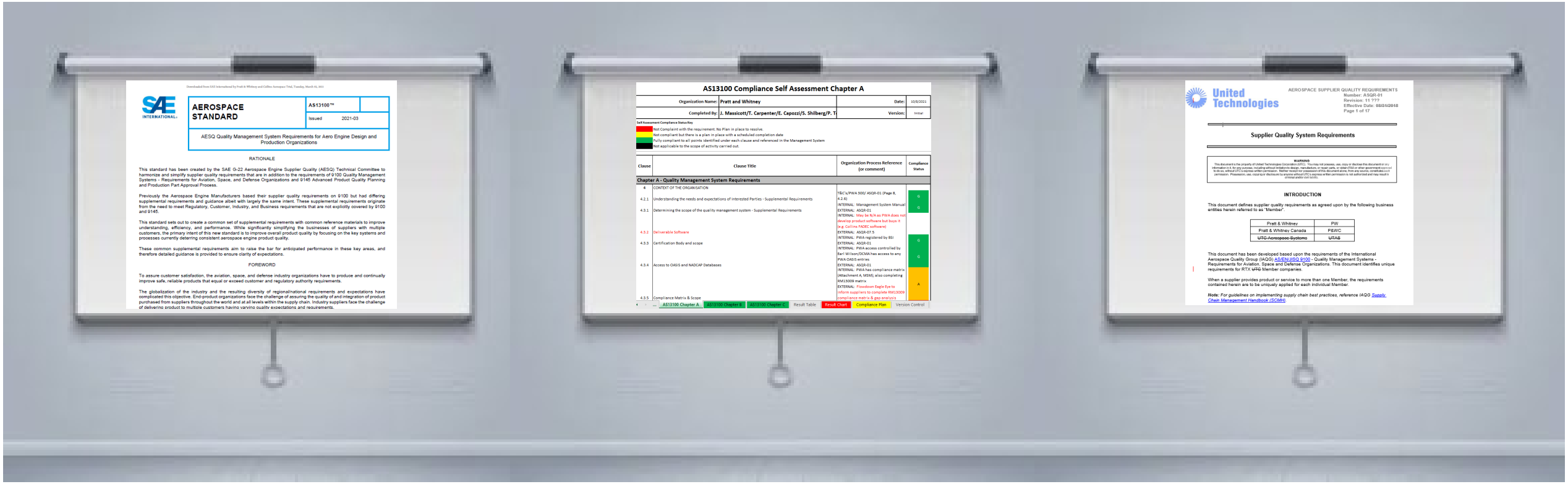
**ASQR-01 Rev 10, 11/1/2016**
AS13001 – Delegated Product Release Verification Training Requirements
AS13002 – Inspection Frequency Plans
AS13003 – Measurement Systems Analysis

**UTCQR 09.1 Rev 6, 2/19/2019**
AS13004 – PFMEA & Control Plans
AS13006 – Process Control Methods

**ASQR-9.2 Rev 2, 1/28/2019 (Formatted based on AS9145)**
AS9145 – Requirements for Advanced Product Quality Planning and Production Part Approval Process

# AS13100 GAP ASSESSMENT

## UNITIZED RM13009 AND THE ASQR-01 NEW SUPPLIER CHECKLIST



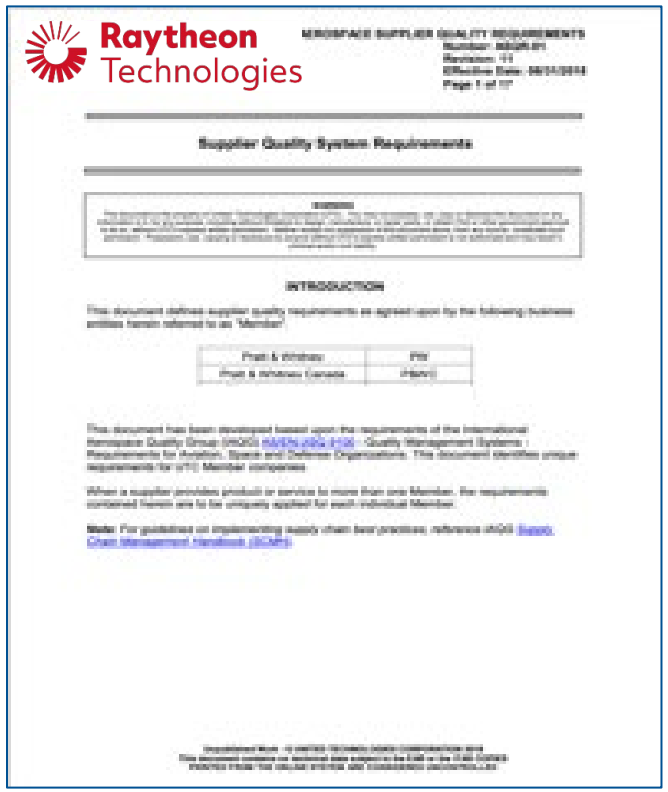

**AS13100**

**RM131009**

**ASQR-01**

# TRANSITION OF ASQR-01 -> AS13100

## ASQR JOURNEY HAS PROGRESSED, AND NOW IF INFLUENCED BY AS13100

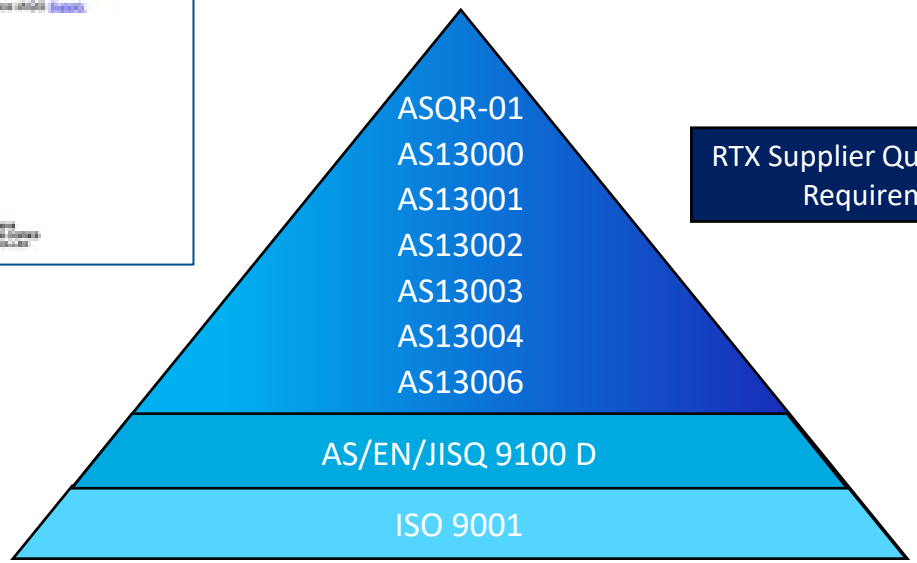



**AS1300X**

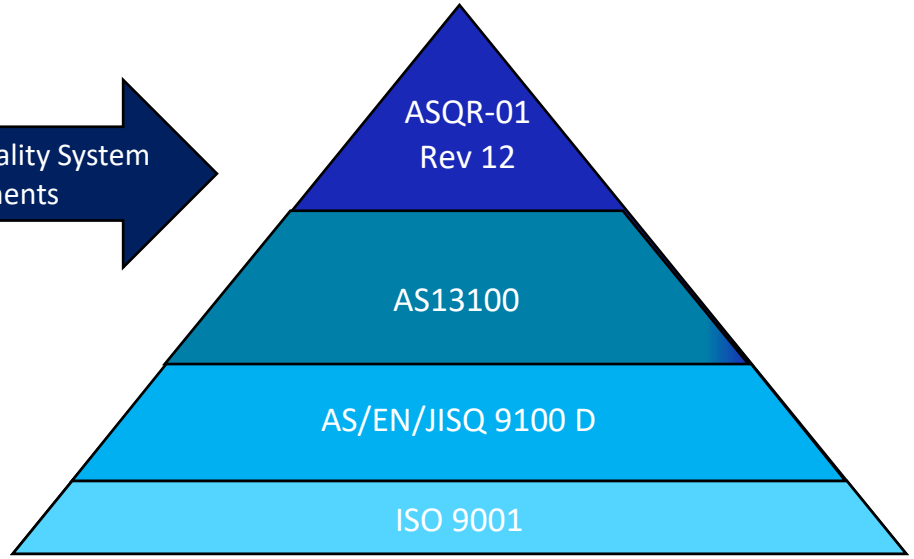
**ASQR-01 Rev 11**
RTX Supplier Quality System Requirements

**AS13100**

**ASQR-01 Rev 12**
P&W SUPPLEMENT TO AS13100




RTX Supplier Quality System Requirements



# TRANSITION OF ASQR-01 -> AS13100

## ASQR JOURNEY HAS PROGRESSED, AND NOW IF INFLUENCED BY AS13100

**ASQR-01 Revision 12**

Current requirements of ASQR-01 Rev 11 at**174** pages forecast to drop to **102 pages,** a 41% reduction.

"**Shalls**" forecasted to be reduced by more than **23%**

ASQR-01, Revision 12 based now on International Aerospace Standard **AS13100**

With the addition of:

- ✓ Human Factors
- ✓ Sub-tier Management
- ✓ Internal Audit and Auditor Competencies
- ✓ Design and Development

# TRANSITION OF ASQR-01 -> FUTURE STATE

## ENSURING PW SPECIFIC NEEDS ARE CAPTURED


**ASQR-01 Rev. 12**

Formatting will align with AS9100, AS9145, & A13100 paragraph sections

Will apply to PWA & PWC

Target release Q2

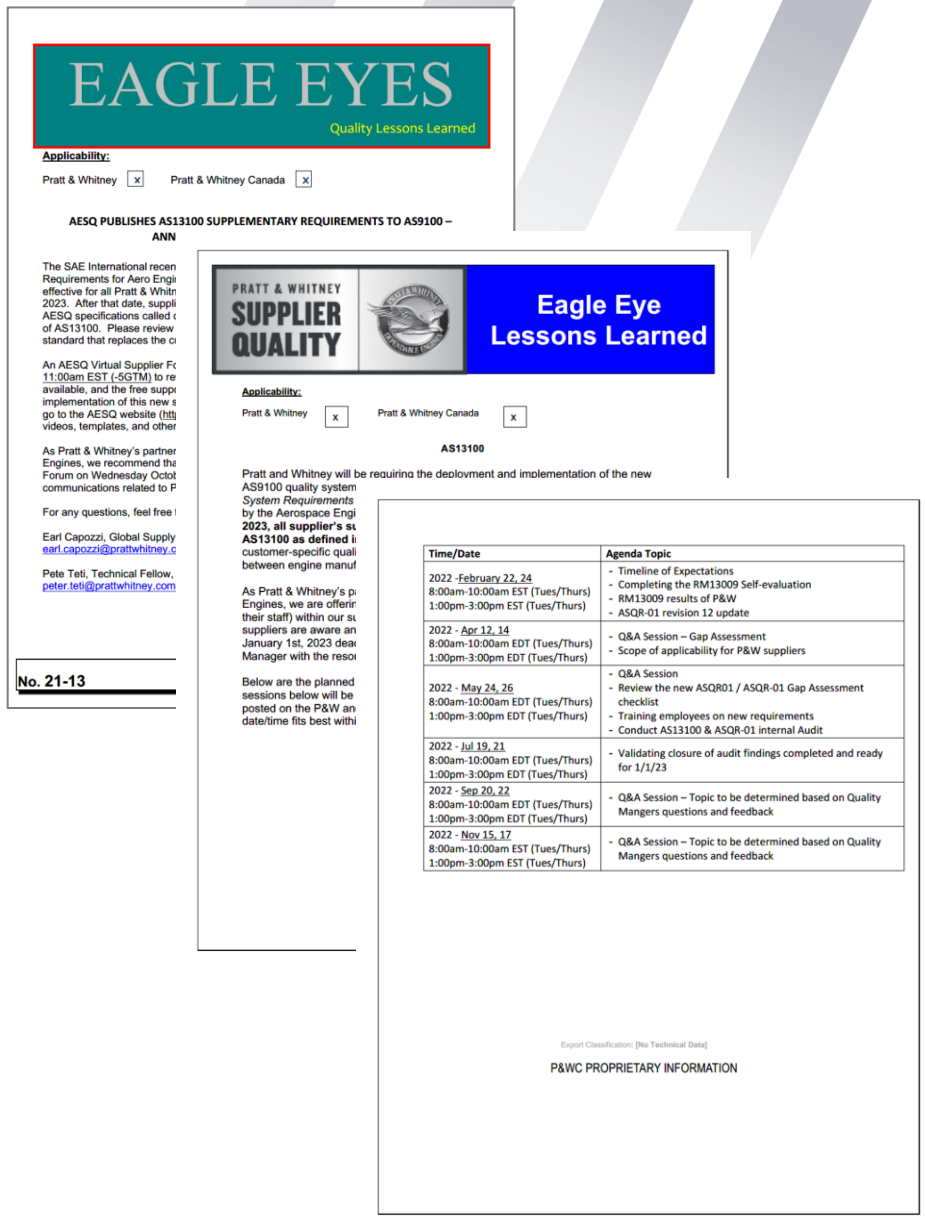
# ASQR-01 / AS13100 COMMUNICATIONS

## STANDARD AND HOSTED COMMUNICATIONS ARE BEING DEPLOYED

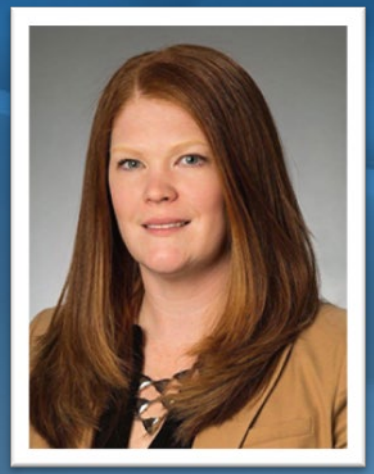
PW conducting multiple events to facilitate adoption of AS13100

Linkage to FAQs on AS13100 and ASQR-01 communicated

Material is hosted on the PW and PWC Supplier Portal.



# AS13100
# DEPLOYMENT DASHBOARD



**ELIZABETH PACE**
ASSOCIATE DIRECTOR, SUPPLIER QUALITY
RAYTHEON TECHNOLOGIES

# Deployment Strategy Group Dashboard

| Company | Milestone 1 | Milestone 2 | Milestone 3 | Milestone 4 | Milestone 4b | Milestone 5 | Milestone 6 | Milestone 7 |
|---|---|---|---|---|---|---|---|---|
| GE Aviation | | | | | | | | |
| GKN Aerospace | | | | | | | | |
| Honeywell | | | | | | | | |
| Howmet | | | | | | | | |
| IHI | | | | | | | | |
| MTU | | | | | | | | |
| PCC | | | | | | | | |
| Pratt and Whitney | | | | | | | | |
| Rolls Royce | | | | | | | | |
| Safran | | | | | | | | |

December 31, 2022

| Milestones |
|---|
| Milestone 7: AS13100 compliance by supply base |
| Milestone 6: Training plan executed to supply base |
| Milestone 5: Training plan executed internally |
| Milestone 4b: Flow down of the Standard to the supply base. |
| Milestone 4: Communication plan executed to supply base. |
| Milestone 3: Communication plan executed internally. |
| Milestone 2: Project Plan Identified and Approved by Member Executive. (All have committed to deployment of Dec 2022 but plan to get there can vary.) |
| Milestone 1: GAP analysis being conducted. Member company committed to deployment by Dec 2022. |

Complete  In Work  At Risk  Off Plan

# Member companies in process of rolling out new flow downs


All member companies are working on flow downs over next few months (COMPLIANCE IS ALIGNED)

All members companies committed to AS13100 standard compliance December 31, 2022

Company specific requirements will be reduced

AS13100 is supported by free issue reference manual guides, LinkedIn Communities of Practice and Webinars

Common training requirements are being provided by 3rd party professionals and is available globally

# Subject Matter Interest Groups Status

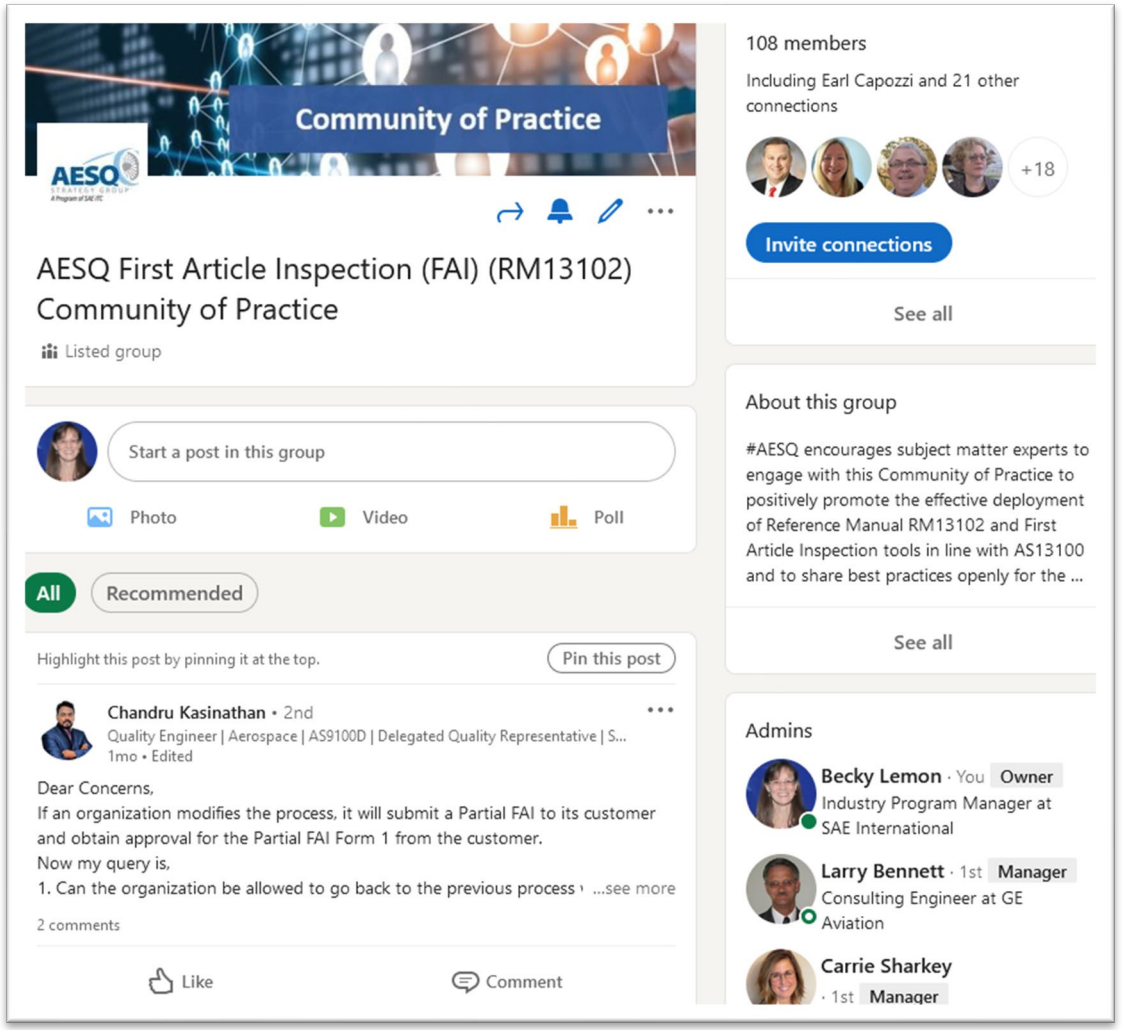
Completed
In Work
Not Started

| Subject Matter Interest Group | Team Leader | Deputy Team Leader | Team Size | Charter | Regular Meetings | Activity Schedule | Web Page | Linkedin/ COP Page | Events |
|---|---|---|---|---|---|---|---|---|---|
| Problem Solving Methods (RM13000) | Marnie Ham (GE) | | | | | | | | |
| DPRV Training (AS13001) | Earl Capozzi (P&W) | | | | | | | | |
| Process Control (incl. Inspection Frequency) (RM13002 & RM13006) | Pete Teti (P&W) | | | | | | | | |
| MSA (RM13003) | Simon Gough-Rundle (RR) | | | | | | | | |
| Defect Prevention Quality Tools (RM13004) | Ian Riggs (RR) | | | | | | | | |
| Quality Audit Methods (RM13005) | Tony Pailing (RR) | | | | | | | | |
| Sub-tier Management (RM13007) | Vince Miller (Howmet) | | | | | | | | |
| Design Methods (RM13008) | Lena Eckerbom Wendel (GKN) | | | | | | | | |
| Human Factors (RM13010) | Catherine Catarina-Graca (Safran) | | | | | | | | |
| First Article Inspection (RM13102) | Carrie Sharkey (RR) | | | | | | | | |
| APQP & PPAP (RM13145) | Karl Evans (RR) | | | | | | | | |

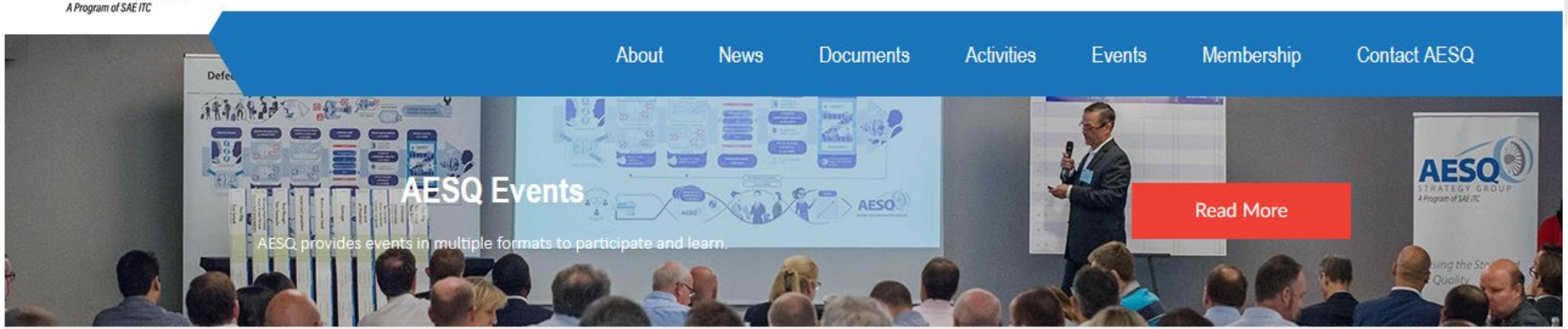
# 11 Communities of Practice (CoP) Launched - 1,532 Members Collectively (as of April 25)

AESQ STRATEGY GROUP
A Program of SAE ITC

- AESQ Sub-Tier Management (RM13007) Community of Practice — Owner — 120 members
- AESQ Quality Audit Methods (RM13005) Community of Practice — Owner — 187 members
- AESQ First Article Inspection (FAI) (RM13102) Community of Practice — Owner — 176 members
- AESQ Process Control Methods (RM13006) Community of Practice — Owner — 4 members
- AESQ Defect Prevention Tools for APQP (RM13004) Community of Practice — Owner — 259 members
- AESQ Design Work & Production Repair/Rework (RM13008 & RM13011) Community of Practice — 104 members
- AESQ Measurement Systems Analysis (MSA) (RM13003) Community of Practice — Owner — 121 members
- AESQ Human Factors (RM13010) Community of Practice — Owner — 60 members
- AESQ Problem Solving Methods (RM13000) Community of Practice — Owner — 185 members
- AESQ APQP & PPAP (RM13145) Community of Practice — Owner — 215 members
- Aerospace DPRV — Owner — 101 members



# AESQ UPCOMING EVENTS



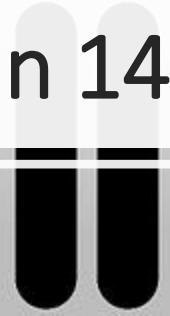

| | | | |
|---|---|---|---|
| AEROSPACE | AESQ RM13000 Problem Solving Supplier Feedback Webinar | Virtual | April 20, 2022 |
| AEROSPACE | AESQ Virtual Supplier Forum – April 28 | Virtual | April 28, 2022 |
| AEROSPACE | AESQ Virtual Supplier Forum - May 4, 2022 | Virtual | May 4, 2022 |
| AEROSPACE | AESQ RM13000 – Webinar: What Makes a Good 8D? | Virtual | May 25, 2022 |
| AEROSPACE | AESQ AS13100 & RM13004 Key Requirements for Design FMEA Webinar – Part 1 | Virtual | June 22, 2022 |
| AEROSPACE | AESQ AS13100 & RM13004 Key Requirements for Design FMEA Webinar – Part 2 | Virtual | June 23, 2022 |

# Pause

Return in 15 Minutes

# Pause

Return in 14 Minutes



# Pause

Return in 13 Minutes

# Pause

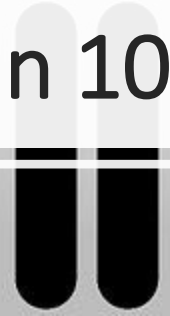
Return in 12 Minutes

# Pause

Return in 11 Minutes

# Pause

Return in 10 Minutes



# Pause

Return in 9 Minutes

# Pause

Return in 8 Minutes

# Pause

Return in 7 Minutes

# Pause

Return in 6 Minutes

# Pause

Return in 5 Minutes

# Pause

Return in 4 Minutes

# Pause

Return in 3 Minutes

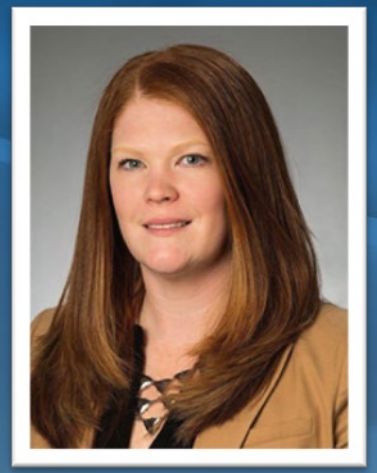
# Pause

Return in 2 Minutes

# Pause

Return in 1 Minute

# AS13100
# DEPLOYMENT SURVEY RESULTS



**ELIZABETH PACE**
ASSOCIATE DIRECTOR, SUPPLIER QUALITY
RAYTHEON TECHNOLOGIES

**JIM WILSON**
SR MANAGER, SUPPLIER QUALITY & DEVELOPMENT
PRATT & WHITNEY CANADA

# Feedback and Survey Overview

**August 2021: First survey of suppliers on the general knowledge of AS13100 and the AESQ**

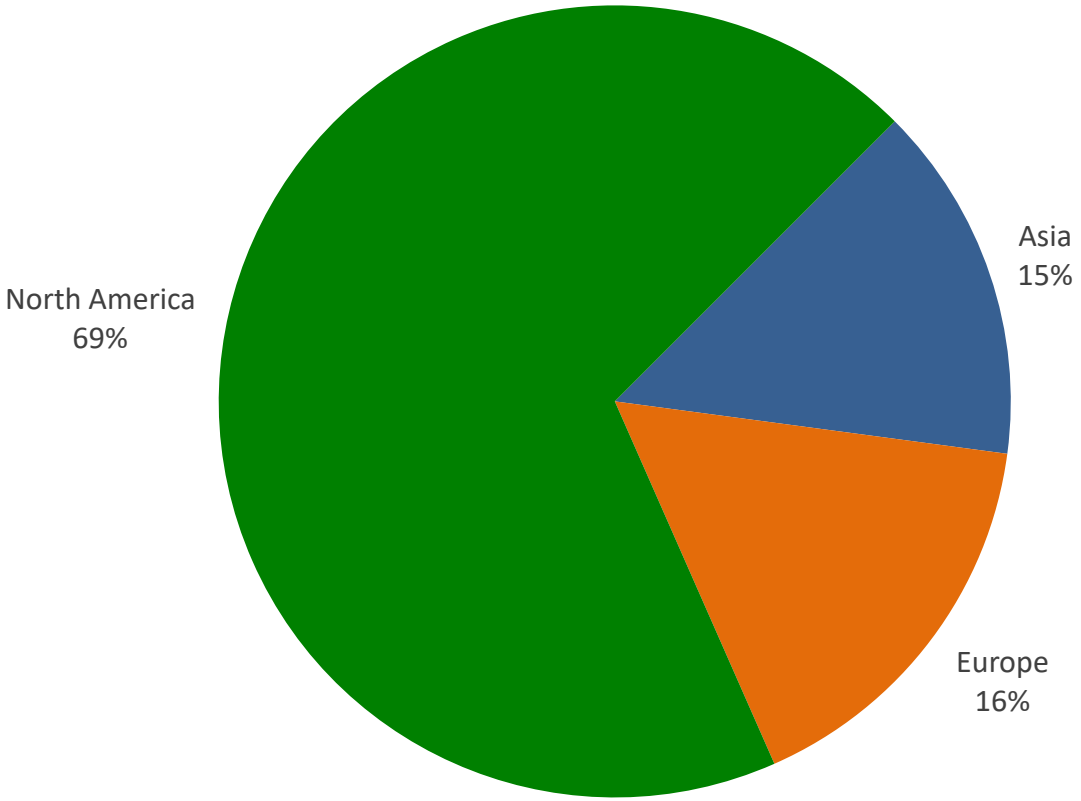
- 158 respondents
- Familiar with AESQ for existing AS13XXX documents
- Create a baseline for deployment well before the deadline
- Basic AS13100 familiarity
- Collected feedback to drive actions

**April 2022: Follow up survey targeted to better understand the aero-engine supply base's AS13100 implementation status**

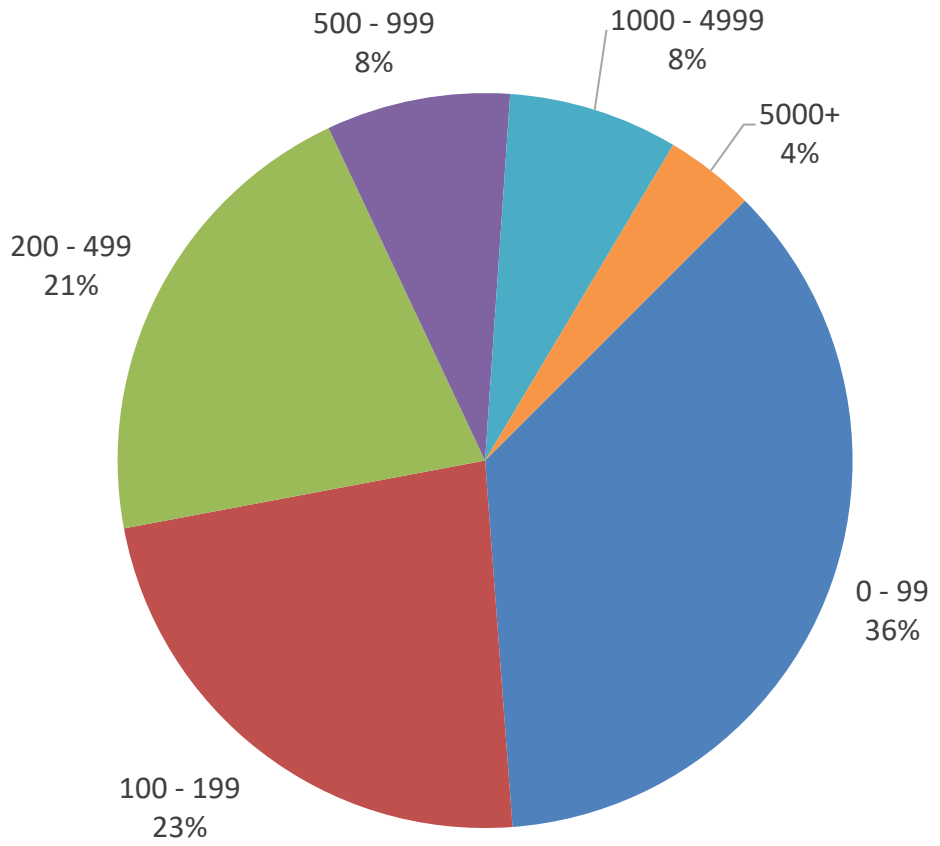
- 13 questions, both objective and open-ended
- 482 respondents to date
- 608 comments and suggestions being analyzed for actions

# Respondent Demographics

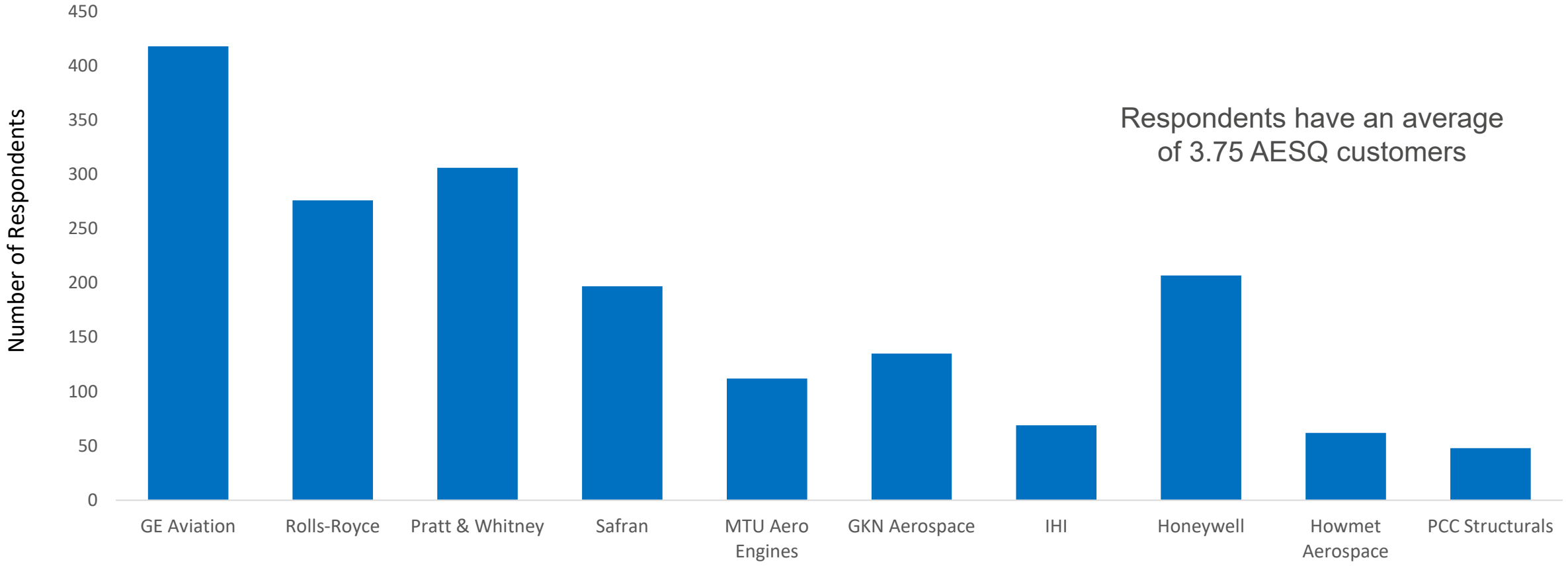
## Respondent Location



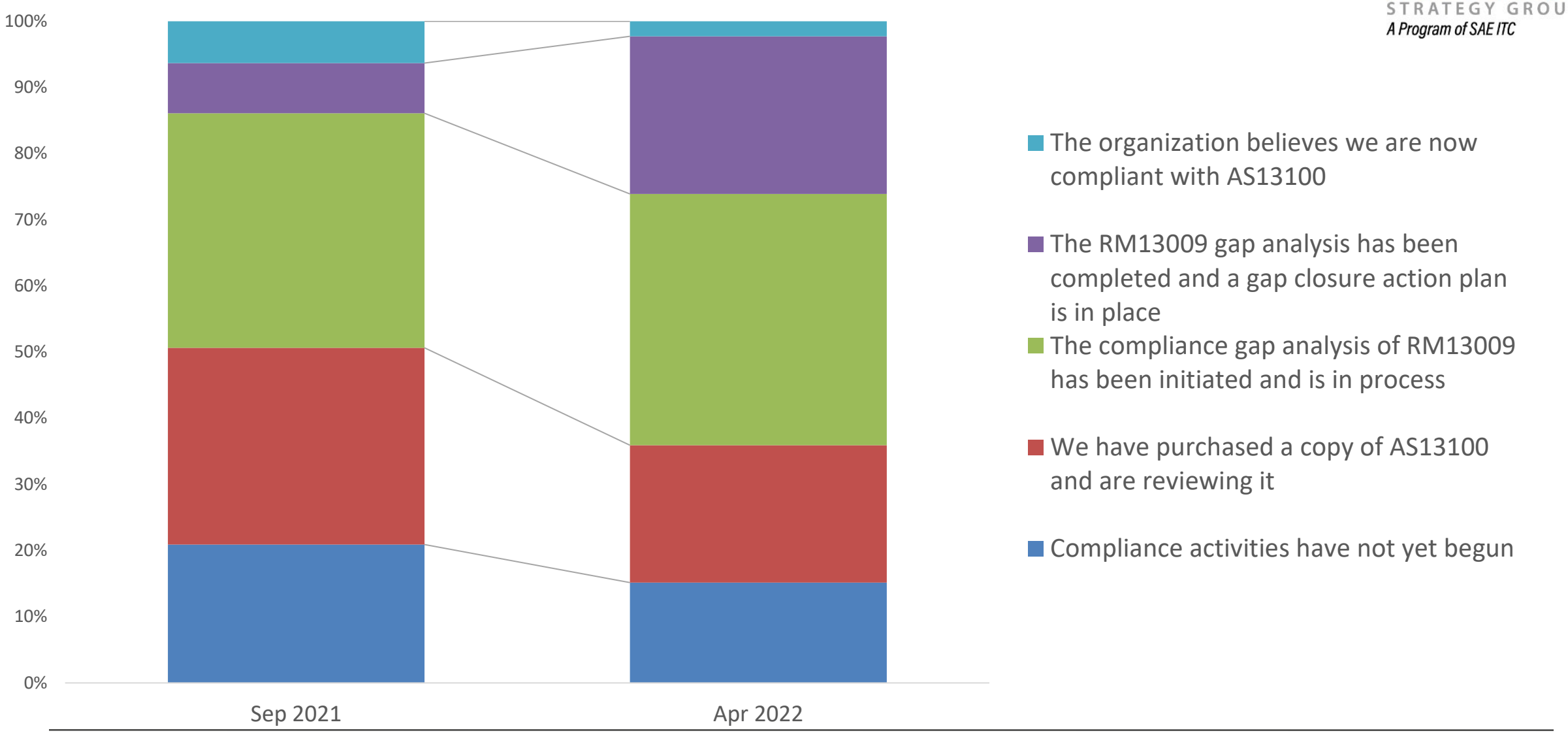

## Respondent Company Size



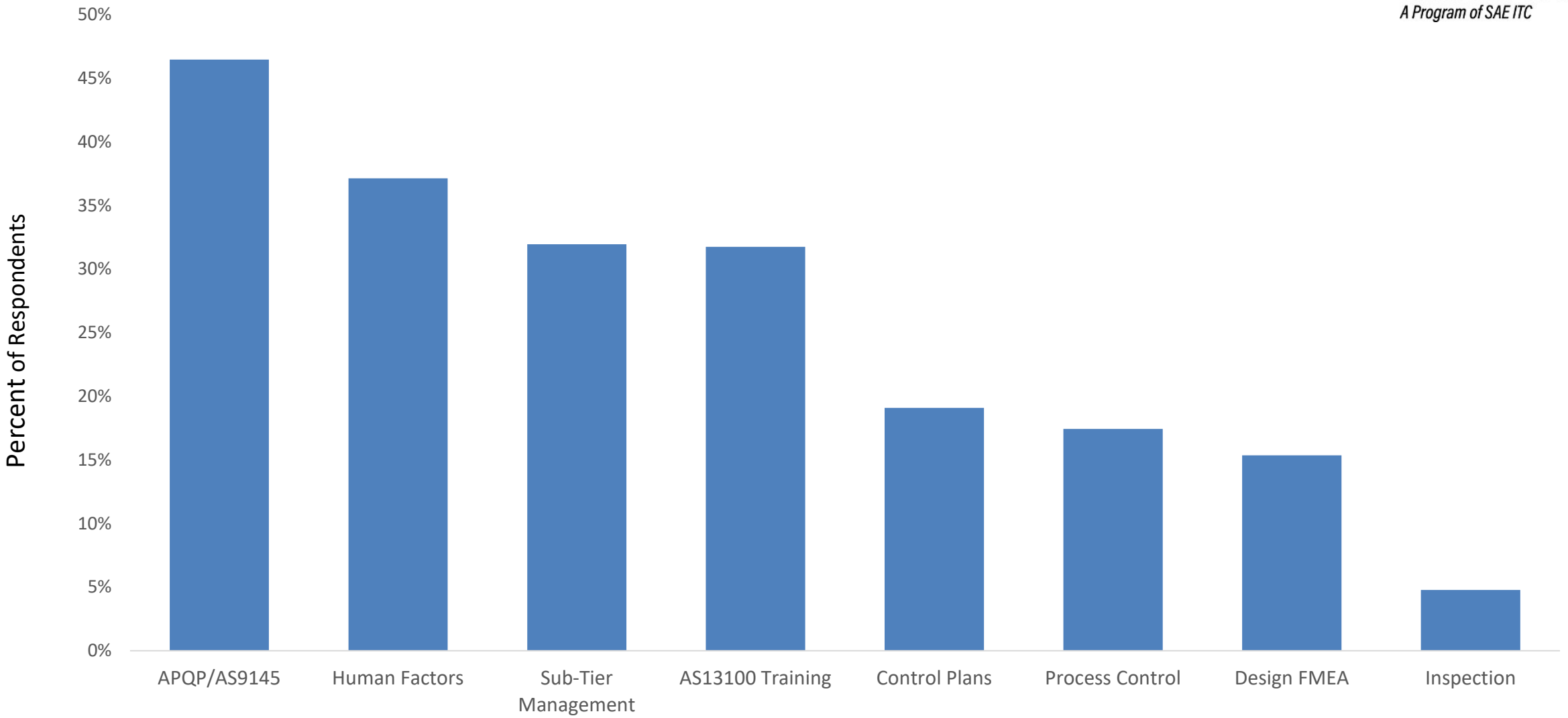
# Respondents Supply to Multiple AESQ Members



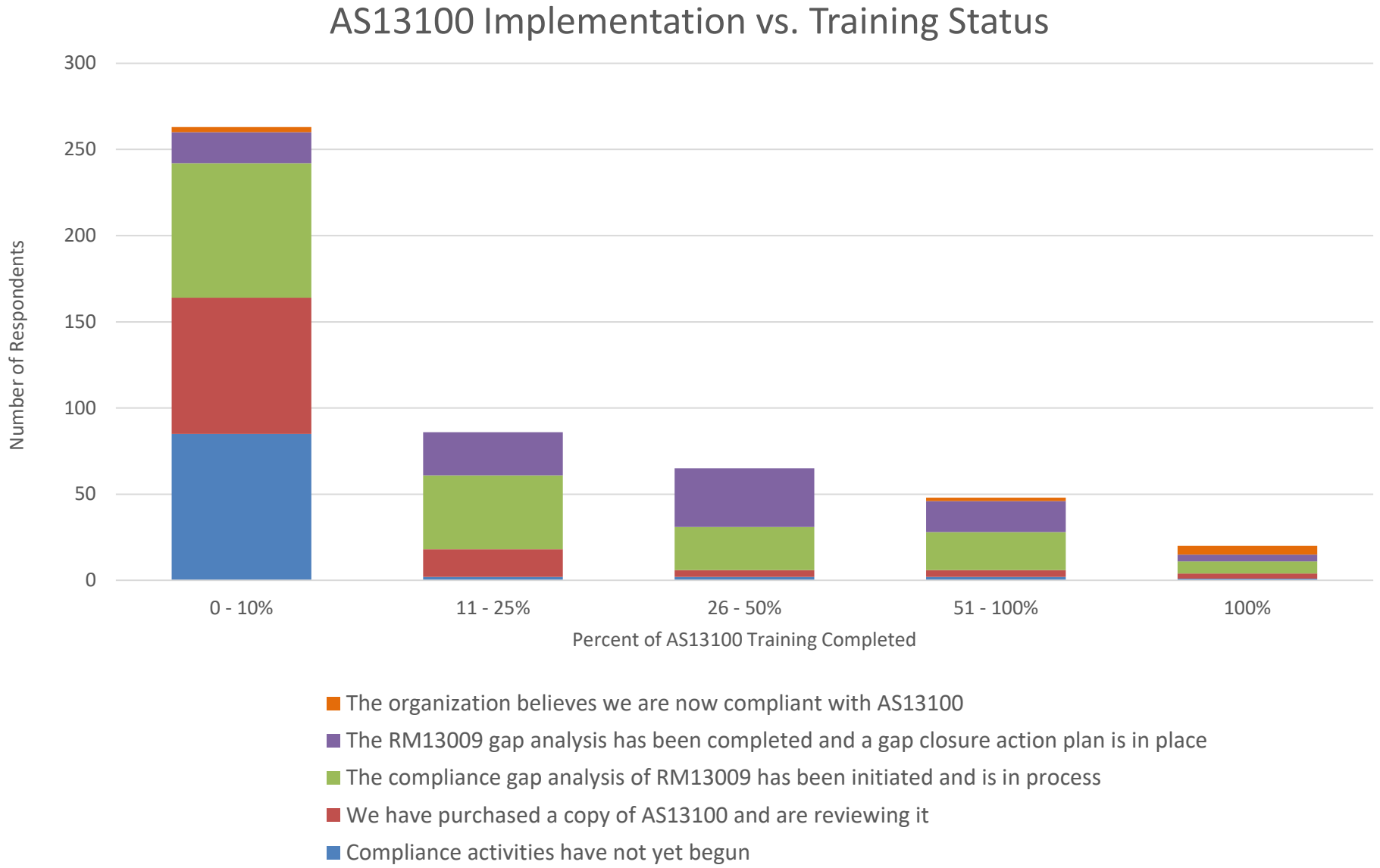
# Evolution of Implementation Status



# Where Can We Help?



# What You Told Us



# Launch Your Company Into a Good Position for Compliance

## UNDERSTAND YOUR POSITION

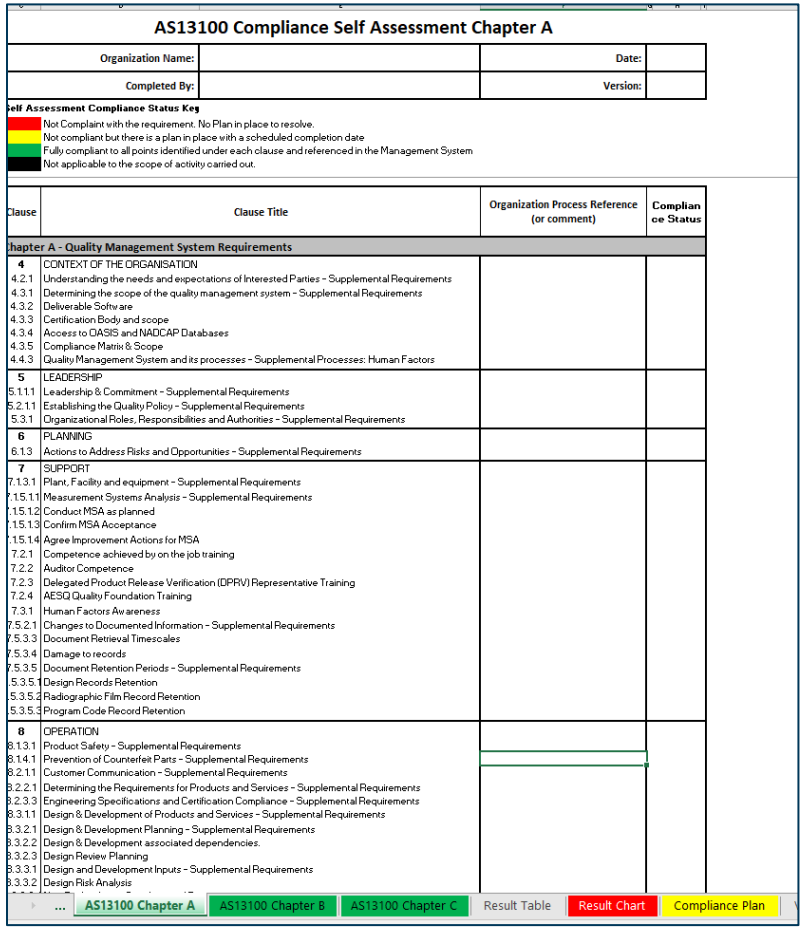
Complete GAP Analysis and Document closure plan

## GET INVOLVED

Sign up for webinars and communities of practice

## FURTHER YOUR KNOWLEDGE

Reach out for training opportunities



**AS13100 Compliance Self Assessment Chapter A**

| | | | |
|---|---|---|---|
| Organization Name: | | Date: | |
| Completed By: | | Version: | |

Self Assessment Compliance Status Key
- Not Complaint with the requirement. No Plan in place to resolve.
- Not compliant but there is a plan in place with a scheduled completion date
- Fully compliant to all points identified under each clause and referenced in the Management System
- Not applicable to the scope of activity carried out.

| Clause | Clause Title | Organization Process Reference (or comment) | Compliance Status |
|---|---|---|---|
| Chapter A - Quality Management System Requirements | | | |
| 4 | CONTEXT OF THE ORGANISATION | | |
| 4.2.1 | Understanding the needs and expectations of Interested Parties - Supplemental Requirements | | |
| 4.3.1 | Determining the scope of the quality management system - Supplemental Requirements | | |
| 4.3.2 | Deliverable Software | | |
| 4.3.3 | Certification Body and scope | | |
| 4.3.4 | Access to OASIS and NADCAP Databases | | |
| 4.3.5 | Compliance Matrix & Scope | | |
| 4.4.3 | Quality Management System and its processes - Supplemental Processes: Human Factors | | |
| 5 | LEADERSHIP | | |
| 5.1.1.1 | Leadership & Commitment - Supplemental Requirements | | |
| 5.2.1.1 | Establishing the Quality Policy - Supplemental Requirements | | |
| 5.3.1 | Organizational Roles, Responsibilities and Authorities - Supplemental Requirements | | |
| 6 | PLANNING | | |
| 6.1.3 | Actions to Address Risks and Opportunities - Supplemental Requirements | | |
| 7 | SUPPORT | | |
| 7.1.3.1 | Plant, Facility and equipment - Supplemental Requirements | | |
| 7.1.5.1.1 | Measurement Systems Analysis - Supplemental Requirements | | |
| 7.1.5.1.2 | Conduct MSA as planned | | |
| 7.1.5.1.3 | Confirm MSA Acceptance | | |
| 7.1.5.1.4 | Agree Improvement Actions for MSA | | |
| 7.2.1 | Competence achieved by on the job training | | |
| 7.2.2 | Auditor Competence | | |
| 7.2.3 | Delegated Product Release Verification (DPRV) Representative Training | | |
| 7.2.4 | AESQ Quality Foundation Training | | |
| 7.3.1 | Human Factors Awareness | | |
| 7.5.2.1 | Changes to Documented Information - Supplemental Requirements | | |
| 7.5.3.3 | Document Retrieval Timescales | | |
| 7.5.3.4 | Damage to records | | |
| 7.5.3.5 | Document Retention Periods - Supplemental Requirements | | |
| 7.5.3.5.1 | Design Records Retention | | |
| 7.5.3.5.2 | Radiographic Film Record Retention | | |
| 7.5.3.5.3 | Program Code Record Retention | | |
| 8 | OPERATION | | |
| 8.1.3.1 | Product Safety - Supplemental Requirements | | |
| 8.1.4.1 | Prevention of Counterfeit Parts - Supplemental Requirements | | |
| 8.2.1.1 | Customer Communication - Supplemental Requirements | | |
| 8.2.2.1 | Determining the Requirements for Products and Services - Supplemental Requirements | | |
| 8.2.3.3 | Engineering Specifications and Certification Compliance - Supplemental Requirements | | |
| 8.3.1.1 | Design & Development of Products and Services - Supplemental Requirements | | |
| 8.3.2.1 | Design & Development Planning - Supplemental Requirements | | |
| 8.3.2.2 | Design & Development associated dependencies. | | |
| 8.3.2.3 | Design Review Planning | | |
| 8.3.3.1 | Design and Development Inputs - Supplemental Requirements | | |
| 8.3.3.2 | Design Risk Analysis | | |

... | AS13100 Chapter A | AS13100 Chapter B | AS13100 Chapter C | Result Table | Result Chart | Compliance Plan

# APQP DEPLOYMENT

**KARL EVANS**
APQP TECHNICAL PROJECT MANAGER
ROLLS-ROYCE

# AS13100/9145 APQP and PPAP

**Higher quality** is synonymous with **increased product safety**.

The primary objective is to **improve quality and reduce cost**.

**A common process up and down the supply chain** removing wasted effort and mis-communications.


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

**Proactive toolbox to focus cross-functional teams** on risk identification and mitigation early in the process.

**Provides a foundation for successful ongoing change management**

– design modification, works transfers, changes to manufacturing method

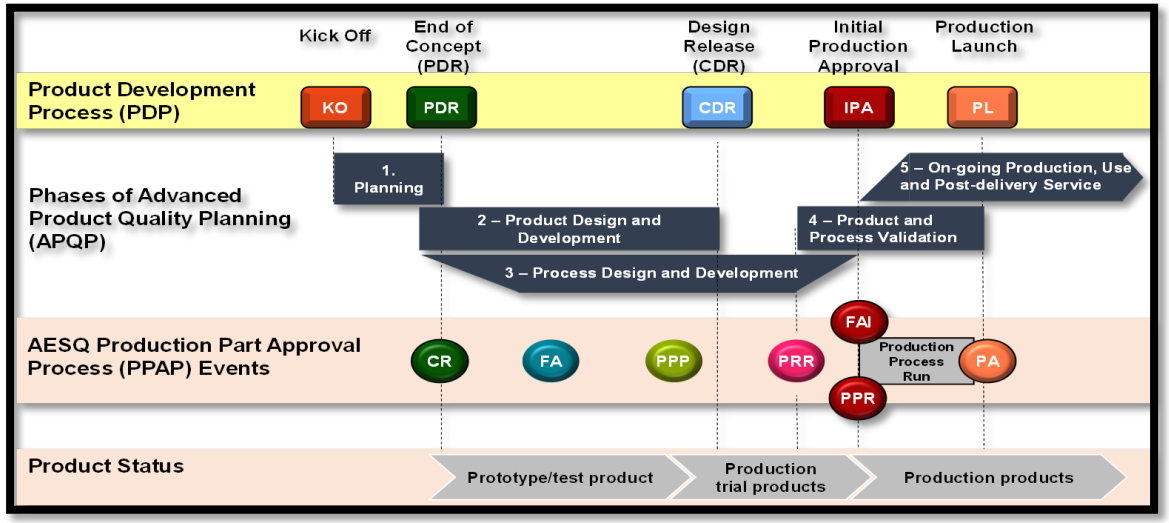
# Application within Rolls-Royce of AS13100/9145 APQP and PPAP


**Ourselves**…Rolls-Royce Civil Aerospace is fully committed to APQP, PPAP and Cross functional working.

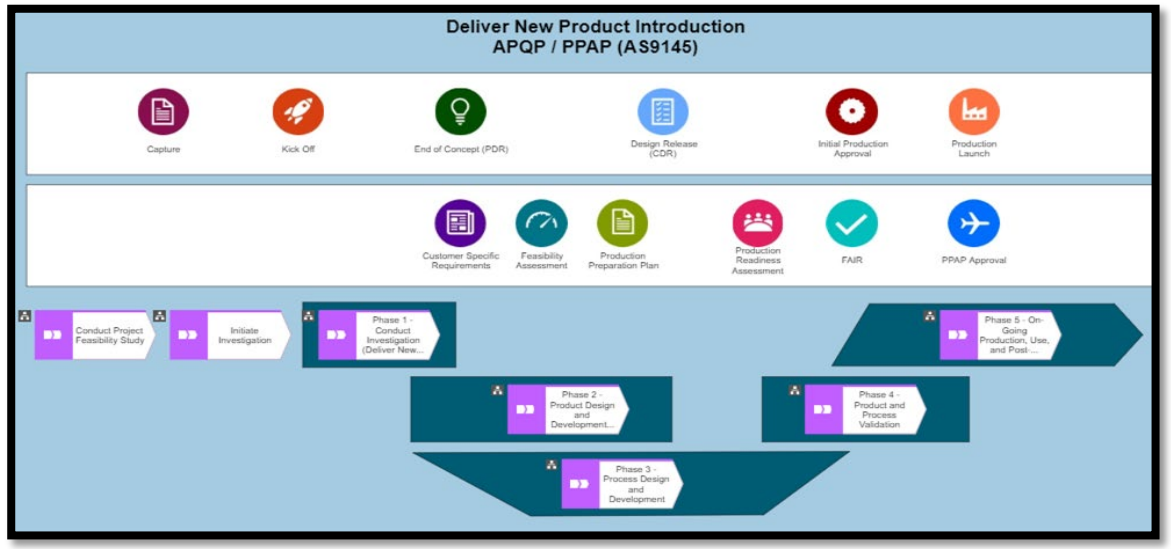
**Our Customers**…they are asking for this.

**Our Suppliers**…AS13100 APQP and PPAP means we have significantly reduced our Customer Specific Requirements.

## AS13100 APQP & PPAP Timing Chart




## Rolls-Royce Management System



# Our Journey to APQP

AESQ STRATEGY GROUP
A Program of SAE ITC

2010 2017 2021 2022

**Quality Improvement drivers**

Build in Quality

Zero Defects

**APQP** Early trials

**APQP and PPAP**

**Quality Management Processes**

PPAP IPPR

**Quality Planning Activities**

Adoption of Industry Standards

SPC CCF > KCF PFMEA DFMEA KPC/CI

**SABRe**

| #1 | #2 | #3 | #4 |
|---|---|---|---|
| • NPI Requirements<br>• No industry std<br>• RR Specifics (extensive) | • APQP & PPAP<br>• No industry std<br>• RR Specifics (lots) | • APQP & PPAP<br>• AS9145<br>• RR Specifics (fewer) | • APQP & PPAP<br>• AS13100/ AS9145<br>• RR Specifics (min.) |

Adoption of Industry Standards

# Self reflection on our APQP implementation

Pillars of success:

1. **Leadership** engagement, organisational commitment and management support
2. **Cross-functional teams** – it's a team sport of more than one function/department
3. **Effective project planning and Managing** the project to ensure on-time completion of defined deliverables and outputs

**Leadership**

- Senior Sponsorship & engagement in concepts
- Business Plan Deployment alignment
- Novel learning practices:
  - APQP Games & simulations
  - Video bite size learning

**Cross Functional Teams**

- Launch framework
- Define RACI for activities and Elements
- Building "User Case" value streams (network diagram)
- Functional coaches (DE, ME, PM, Purchase)
- Adopting AS13100 (RM13145) tools:
  - APQP / PPAP Timing Plan
  - Application Matrix

**Project Planning & Management**

- Alignment of APQP and PPAP Events to business change management decisions
- RAPID Decision making for Events
- Visual Management / Kanban Boards for the teams.

**Foundations**

Sponsor (right shadow), Champions (remove barriers), Function Leaders (develop their people) and Core Team (right practices & tools)

# Your Winning Cards – Steps to Successful Deployment

AESQ STRATEGY GROUP
A Program of SAE ITC

## Project Planning & Management

**Confirm decision makers –** RAPID for each APQP & PPAP Event.

Define practices for concern management

## It's a Team Sport

**Clear cross functional accountability –** RACI for each Planning Deliverable and APQP Element.

## People Process

**Availability of capable people –** Maintain Training plan and people planning process

## Develop Leaders of Change

**Est. Deployment Champion(s) –** to remove barriers to success.
**Est. Functional Leads – to** develop their people capability.
**Est. Core team –** to ensure the right practices and tools are available.

## Each time you start

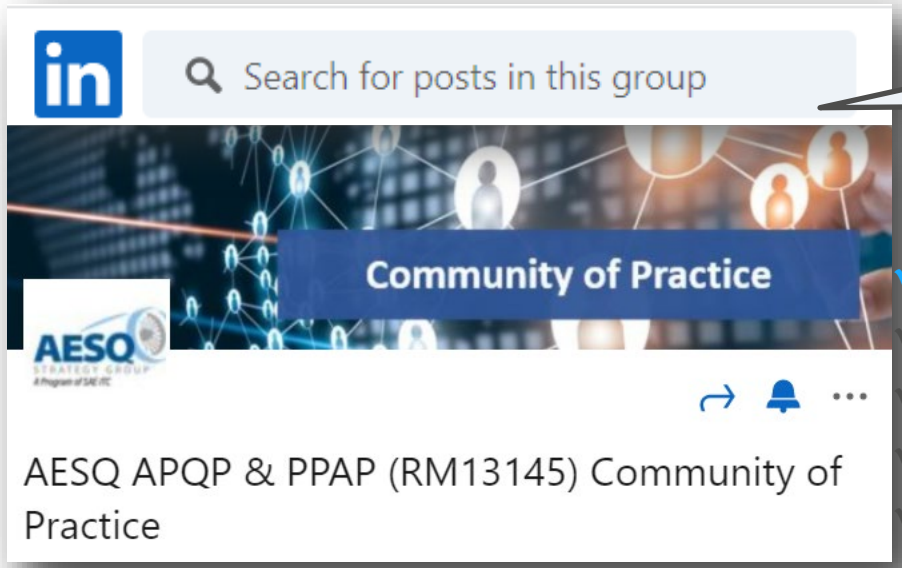
**Upfront requirements capture** – Establish and confirm these as early as possible with Customers & stakeholders

## Progress with a Plan

**Utilise RM13145 –** Applications matrix act as your menu… Events, deliverables & Elements

APQP & PPAP Timing Plan gives you a Planning template.

# Let's Grow our Community




Search LinkedIn **"AESQ Community of Practice"**

- ✓ **APQP & PPAP**
- ✓ Zero Defects Tools
- ✓ Measurement System Analysis
- ✓ Problem Solving
- ✓ Human Factors
- ✓ Etc


Raise questions, share ideas & good practices

Use "RM13145" it contains a volume of good practices

# RISK BASED AUDIT SYSTEM – INTERNAL AND SUPPLIER

**LISA STÖMER**
AUDIT MANAGEMENT
MTU AERO ENGINES AG (MUNICH)

# Agenda

Requirements of AS13100 in relation to „Risk“

Requirements of RM13005 in relation to „Risk“

Implementation of a Risk Based Audit System

MTU’s way to Risk Based Supplier Audits

Outlook – Challenges and Opportunities

# Requirements of AS13100 in relation to „Risk“

Search for „risk“ results in 92 (AS13100) and 34 (RM13005) hits

**Risk (EN9000)**
**= Effect of uncertainty**
(Note 5 to entry: The word “risk” is sometimes used when there is the possibility of only negative consequences.)

## AS13100

### 9.2 Internal Audit

[…] *The frequency of audits shall be reviewed and be increased, if required, due to process changes, quality performance, or risk.*

### 8.4.2.5 Supplier Surveillance - Supplemental Requirements

*The organization shall perform supplier risk assessments, which, at a minimum, include evaluation of results of supplier’s internal audits, supplier’s current quality performance, and part complexity.*

*The organization shall establish and execute appropriate surveillance methods to monitor supplier systems, processes, and products based on the risk evaluations.*

# Requirements of RM13005 in relation to „Risk“

**RM13005 – Quality Audit Requirements**

Introduction

[…] *This guideline defines the process requirements to be used by organizations to establish a procedure to implement, manage and perform effective and risk based internal and supplier surveillance audit program.*

- Audit program based on risk assessments
- Use risk prioritization tools
- Based on the risk evaluation, mitigate the risks by an appropriate response
- One of the risk mitigation activities can be an audit
- Develop risk assessments that cover Quality Management System, Production Processes, Special Processes & Product Conformity

# Implementation of a Risk Based Audit System

MTU intent is a „Risk Minimizing Audit System“

| Audit type | Mandatory requirements AS13100 | Risk based approach |
|---|---|---|
| Quality System Audits | Entire management system within 3 years | Element/area prioritized based on risk |
| Production Process Audits | Every production process within 3 years | Selection of part numbers, workstations etc. based on risk |
| Special Process Audits | All special processes annually | Selection of part numbers, workstations etc. based on risk |
| Product Audits | Annually | Selection of parts based on risk |

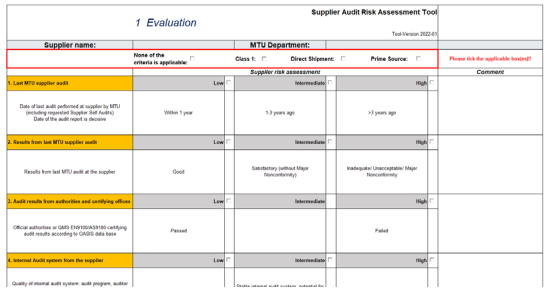
**Definition of risk criteria**

# MTU‘s way to Risk Based Supplier Audits

# MTU‘s way to Risk Based Supplier Audits

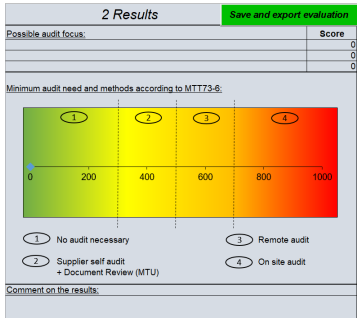
## Implementation of the risk based concept for supplier audits

### Supplier Audit Risk Assessment Tool



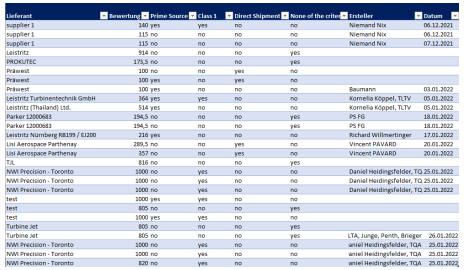

- 16 risk criteria
- Focus on product quality
- Different characteristics and weightings

### Assessment Result: Audit Needs



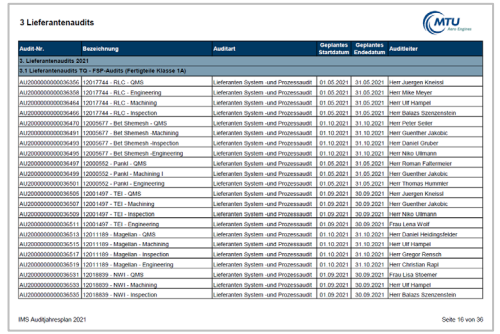

- Result categories (audit methods): *No audit - Supplier Self Audit – Remote Audit – On Site Audit*
- Audit focus related to identified risks

### Data Processing




- Automatic summary of all risk assessments
- Use synergies, e.g. one supplier for two commodities

### Annual Audit Plan




- Centralized and resource optimized planning
- Early involvement of experts

# Outlook – Challenges and Opportunities

RM13005 - Introduction

[…] *Through this approach, it is anticipated that opportunities will be found to remove redundant audits across the supply chain and hence reduce the overall audit burden whilst improving its effectiveness.*

**Overall goal: Reducing the audit burdens by strengthening and using the supplier audit system**

Focusing on „risk suppliers“

Evaluation regarding ethical and soft fatcs

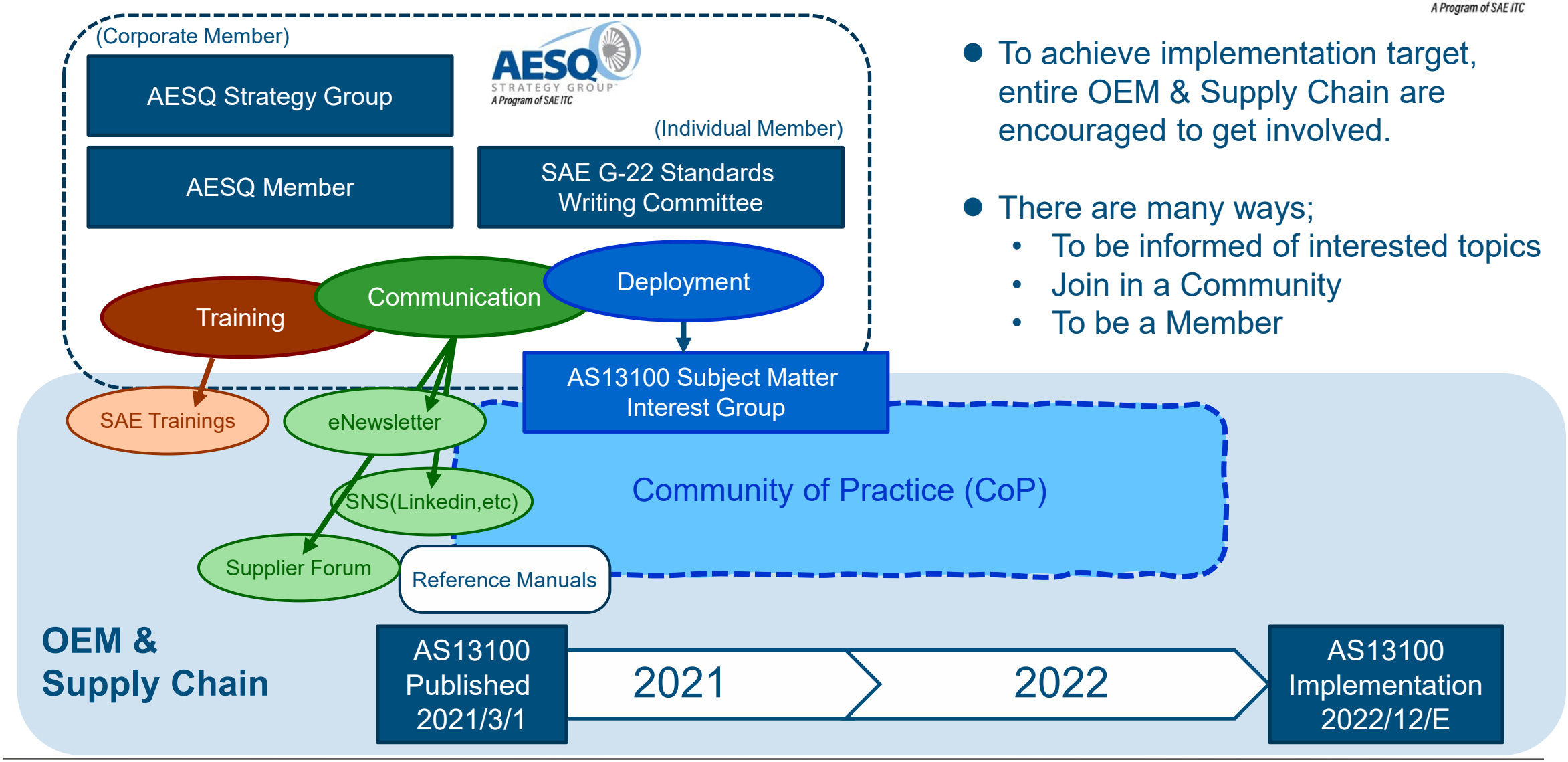
Bring an „element of surprise“ to the audit

# Thank you for your attention.

# AESQ
# HOW TO GET INVOLVED

**JUN SAKAI**
CHIEF ENGINEER
IHI CORPORATION

# How to Get Involved - Overview

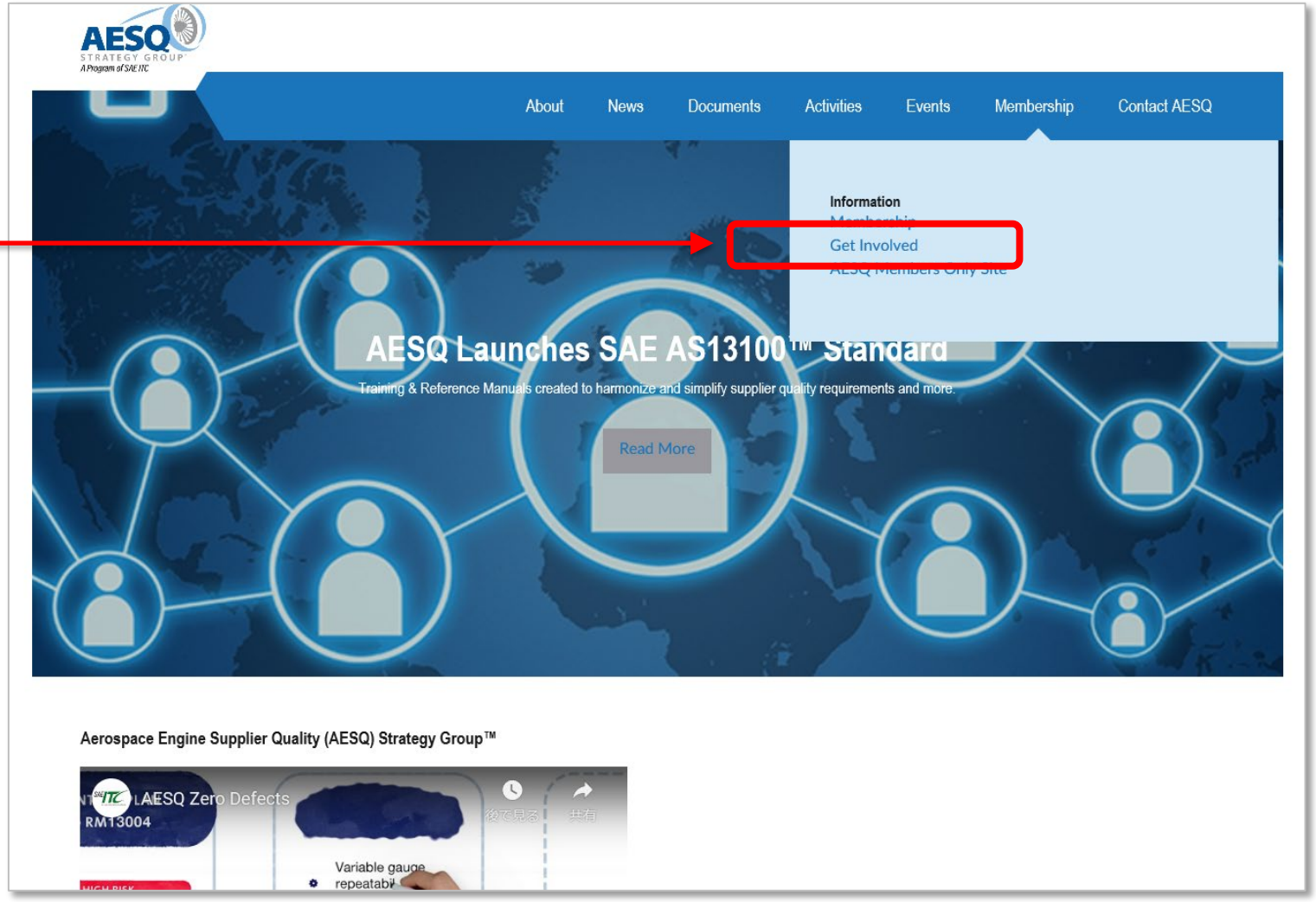



- To achieve implementation target, entire OEM & Supply Chain are encouraged to get involved.
- There are many ways;
  - To be informed of interested topics
  - Join in a Community
  - To be a Member

# “Get Involved” with AESQ

- Go to AESQ Homepage
  https://aesq.sae-itc.com/

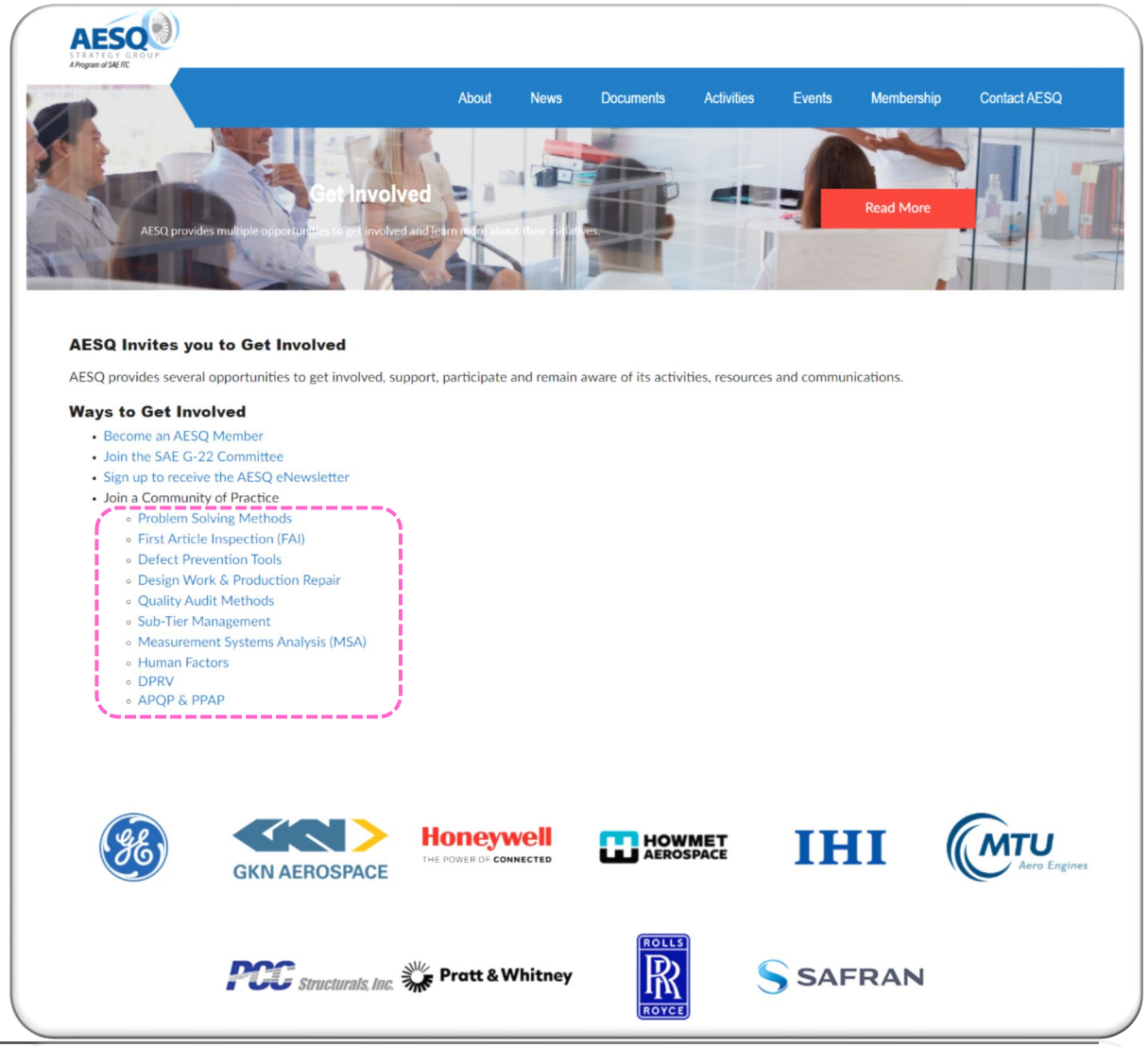
- Click “Get Involved”



# “Get Involved” Options

1. Sign up to receive AESQ eNewsletter
2. Become an AESQ Member
3. Join the SAE G-22 Committee
4. Join a Community of Practice

Click on the appropriate link for additional information




# POLL QUESTION #3: Have you already joined LinkedIn for any of the Communities of Practice? (Yes/No)

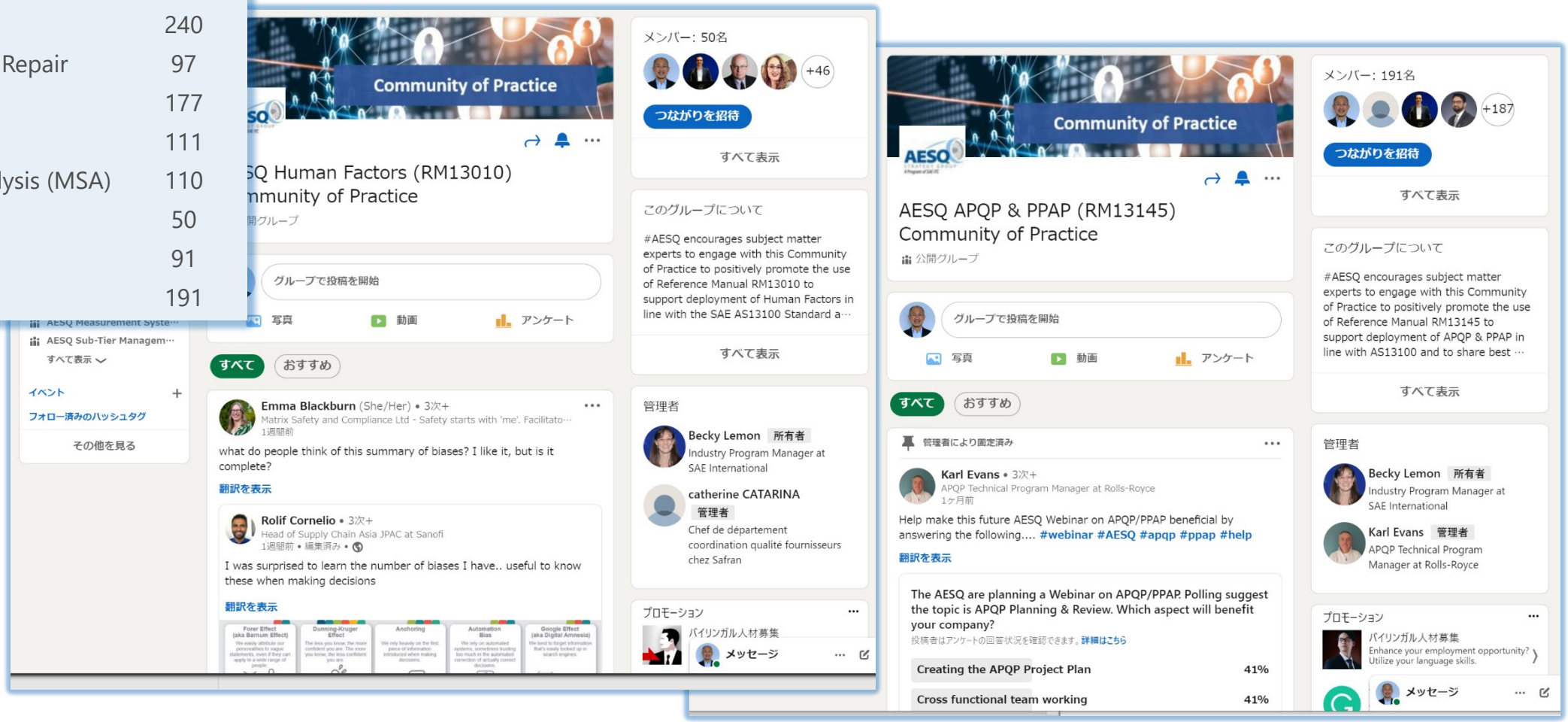
AESQ STRATEGY GROUP
A Program of SAE ITC

- Join a Community of Practice
  - Problem Solving Methods
  - First Article Inspection (FAI)
  - Defect Prevention Tools
  - Design Work & Production Repair
  - Quality Audit Methods
  - Sub-Tier Management
  - Measurement Systems Analysis (MSA)
  - Human Factors
  - DPRV
  - APQP & PPAP

# “Get Involved” – Join a Community of Practice

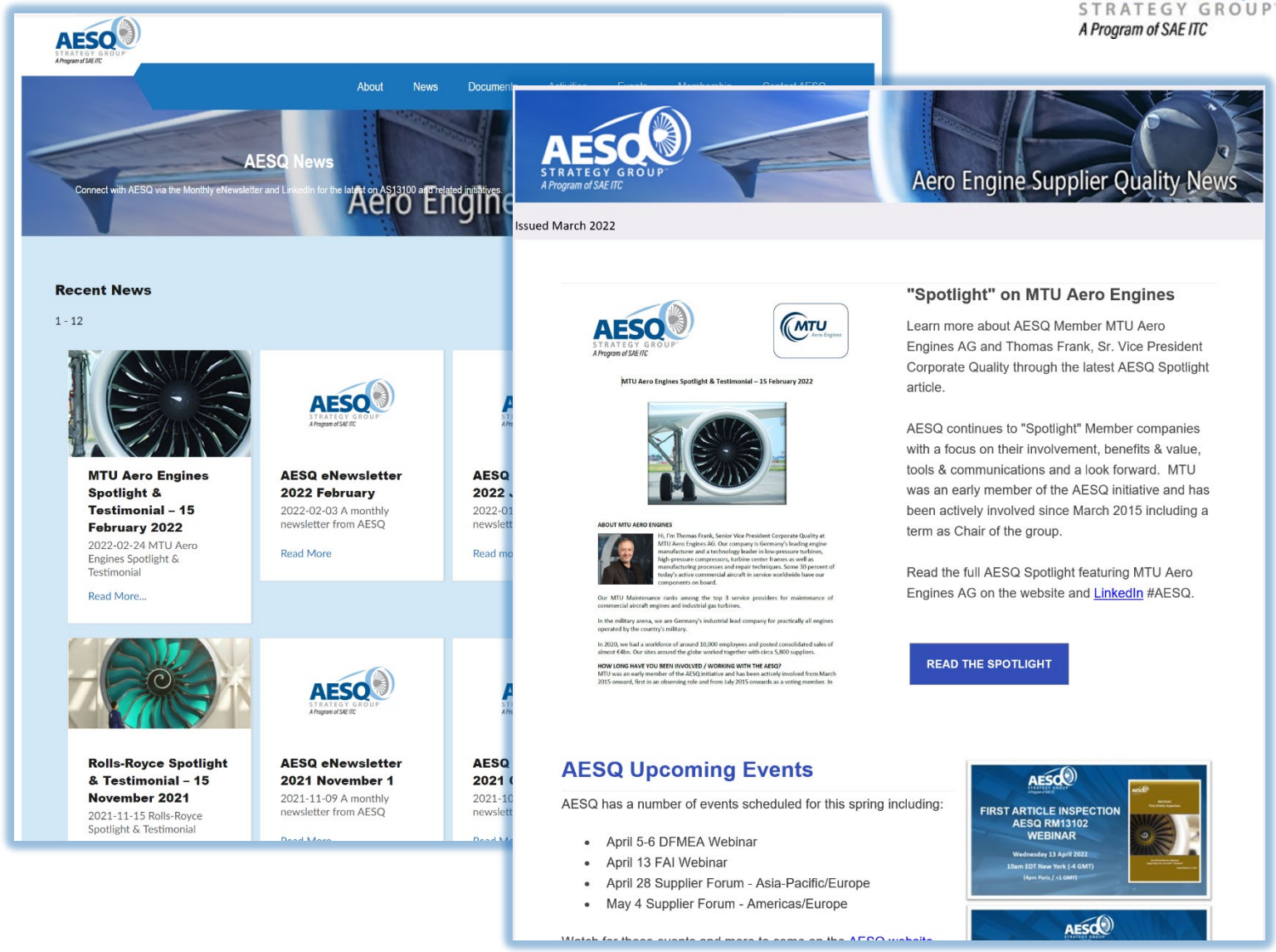
| Community of Practice | Members |
|---|---|
| Problem Solving Methods | 172 |
| First Article Inspection (FAI) | 132 |
| Defect Prevention Tools | 240 |
| Design Work & Production Repair | 97 |
| Quality Audit Methods | 177 |
| Sub-Tier Management | 111 |
| Measurement Systems Analysis (MSA) | 110 |
| Human Factors | 50 |
| DPRV | 91 |
| APQP & PPA | 191 |

LinkedIn Groups for each Community of Practice is now open for anyone to join.



# “Get Involved” – Sign up to Receive AESQ’s eNewsletter

- Issued monthly
- Learn about AESQ’s current activities
- Complete online form to begin receiving



# “Get Involved” – Become an AESQ Member

## 2 Membership Levels:

**AESQ Strategy Group Member** – specified in the AESQ Charter due to their critical support resulting in the establishment of the AESQ Strategy Group.

**AESQ Member** –

- Open to organizations engaged in the Aero Engine supply chain.
- Required to participate in the work of AESQ by providing resources to support AESQ working groups.
- Representatives shall be senior leaders from the organization or subject matter experts in a relevant area.

Complete Membership Application at bottom of page

# “Get Involved” – Subject Matter Interest Groups

- Follow AESQ’s Subject Matter Interest Groups
- Sign up for a Subject Matter Interest Group Webinar


| AESQ Subject Matter Interest Groups | |
|---|---|
| Advanced Product Quality Planning (APQP) & Production Part Approval Process (PPAP) | Defect Prevention Tools to Support APQP & PPAP |
| Design Work & Production Repair & Rework | Measurement Systems Analysis (MSA) |
| Sub Tier Management | Process Control Methods |
| Human Factors | Problem Solving Methods |
| DPRV Training | Quality Audit Methods |
| First Article Inspection | |

# “Get Involved” – Additional Options

- Attend AESQ Events (Supplier Forum, Webinar)
- Take a AS13100 Training Course
- Download Reference Manuals
- Watch the “Zero Defects” Video
- Listen to a Podcast

# QUESTIONS?

**JIM WILSON**
SR MANAGER, SUPPLIER QUALITY & DEVELOPMENT
PRATT & WHITNEY CANADA

# Question & Answer "Q&A" Ground Rules

**We will now accept questions via the Chat function focused on but not limited to today's presentations including:**

- AS13100 Standard
- AS13100 Training
- AESQ Reference Manuals
- Deployment and Transition

**Please avoid questions regarding:**

- Commercialism
- Pricing
- ITAR
- Export Control

# Use the “Chat” Function to Ask a Question..


## … or just make a comment

be kind

# SUMMARY & CLOSE

**BARBARA NEGROE**
EXECUTIVE SOURCING QUALITY LEADER
GE AVIATION

# 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.

# AESQ Thanks You for Attending!


## Stay in Touch: aesq.sae-itc.com