



**AS13100 Deployment
Virtual Supplier Forum
28 April 2022**

Registration Overview

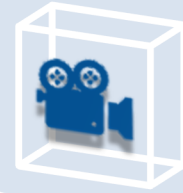


Webinar Overview

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.

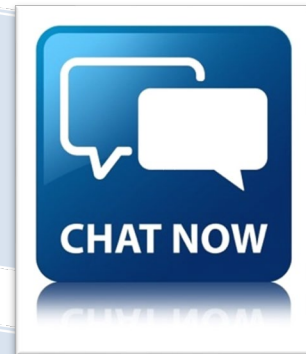
Please remain on Mute during the presentation to prevent background noise. We will also be muting all lines at the start of the session.



Record

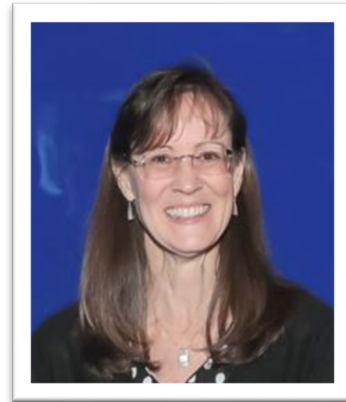


Q&A

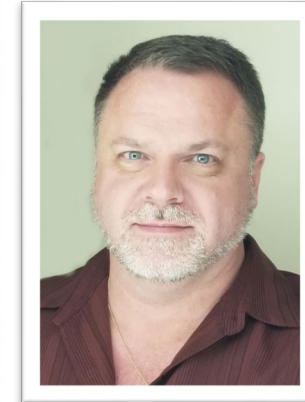


Mute

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






Introducing AS13100: AESQ Quality Management Requirements

THE NEW STANDARD CREATING A COMMON LANGUAGE FOR QUALITY THROUGHOUT THE AEROSPACE ENGINE SUPPLY CHAIN

SAE AS13100 AESQ QUALITY MANAGEMENT SYSTEM REQUIREMENTS FOR AERO ENGINE DESIGN AND PRODUCTION ORGANIZATIONS

This standard sets out to create a common set of supplemental requirements with common training and reference manuals to improve understanding, efficiency, and performance. While significantly simplifying the businesses of suppliers with multiple customers, the primary intent of this new standard is to improve overall product quality by focusing on the key systems and processes currently deterring consistent aerospace engine product quality.

These common supplemental requirements aim to raise the bar for anticipated performance in these key areas, and therefore detailed guidance is provided to ensure clarity of expectations.

To assure customer satisfaction, the aviation, space, and defense industry organizations have to produce and continually improve safe, reliable products that equal or exceed customer and regulatory authority requirements. The globalization of the industry and the resulting diversity of regional/national requirements and expectations have complicated this objective. End-product organizations face the challenge of assuring the quality of and integration of product purchased from suppliers throughout the world and at all levels within the supply chain. Industry suppliers face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

 Learn about how SAE AS13100 AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations minimizes requirements and improves overall product quality by focusing on the key quality systems and processes! Through an executive overview and a self-paced course, your organization can gain key knowledge about a common quality language, how to gain compliance to AS13100 and the business value and benefit of the standard. Walk-through each section of the standard and understand the new requirements.

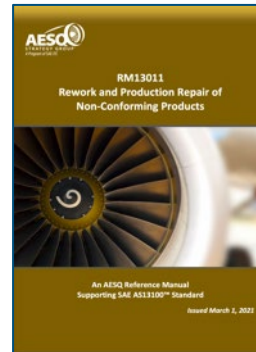
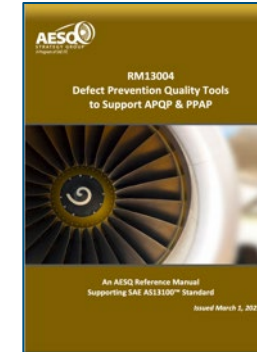
For more information, please visit:
discover.sae.org/AS13100

 **TESTIMONIAL**

"Although created by the Aero Engine Supplier Quality Group in conjunction with the SAE G-22 Aero Engine Supplier Quality Standards Committee, this standard and supporting materials will benefit any organisation, in any industry."

Dr. Ian Riggs
Global Quality Executive
Rolls-Royce & AESQ Chair

Learn more:
www.sae.org/standards/content/AS13100/



AESQ – Aerospace Engine Supplier Quality Strategy Group

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Agenda

| Topic | Presenter |
|---|--|
| AESQ Overview, Vision & Objectives | Emmanuel Vivier, VP Manufacturing & Supply Chain Deputy, Safran Aircraft Engines |
| AS13100 Standard Overview | Earl Capozzi, Associate Director, Discipline Chief Quality & Process Engineering, Pratt & Whitney |
| Deployment Introduction & Milestones | Elizabeth Pace, Supplier Quality Strategy, Associate Director, Raytheon Technologies |
| Deployment Plans: <ul style="list-style-type: none"> • IHI • MTU • Safran • Pratt & Whitney | <ul style="list-style-type: none"> • Hiroshi Yamamoto, General Manager, Quality System Dept., IHI • Michael Mrosewski, Quality Management Programs, MTU • Catherine Catarina-Graca, Supplier Management System Coordinator, Safran Aircraft Engines • Greg Hyatt, Supplier Metallurgical Control Specialist – Japan, Engineering / Supplier Quality, Pratt & Whitney |
| Deployment Dashboard | Elizabeth Pace, Supplier Quality Strategy, Associate Director, Raytheon Technologies |
| BREAK – 15 Minutes | BREAK – 15 Minutes |

Agenda

| Topic | Presenter |
|--|--|
| Deployment Survey Results | Jim Wilson, Sr. Manager, Supplier Quality, & Development, Pratt & Whitney Canada & Elizabeth Pace, Associate Director, Supplier Quality, Raytheon Technologies |
| Focus on APQP Deployment | Karl Evans, APQP Technical Project Manager, Rolls-Royce |
| Approach and Advancement Towards AS13100 | Mani Rathinam Rajamani, Deputy Manager, Quality Engineering, Tata Advanced Systems Ltd. |
| AESQ How to Get Involved | Jun Sakai, Chief Engineer, IHI Corporation |
| Questions | Jim Wilson, Sr. Manager, Supplier Quality, & Development, Pratt & Whitney |
| Summary & Close | Uzam Khan, Supplier Quality Executive, Rolls-Royce |

Use the Chat Function to Ask a Question..



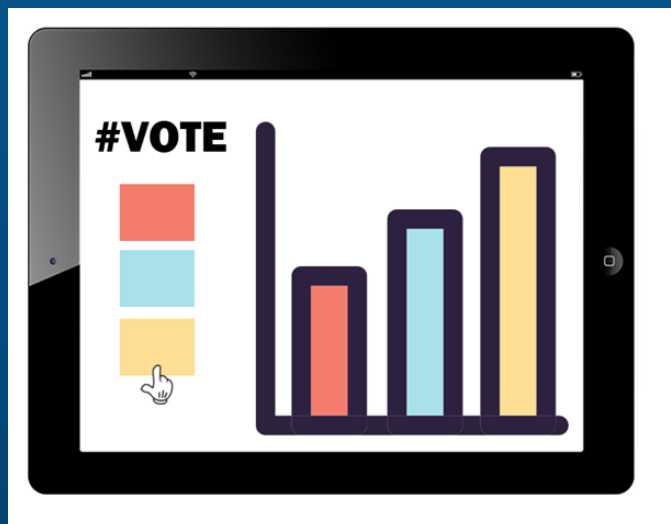
... or just make a comment



be kind

POLL QUESTION #1:

What city are your calling in from today?



AERO ENGINE SUPPLIER QUALITY GROUP (AESQ) OVERVIEW



EMMANUEL VIVIER

VP MANUFACTURING & SUPPLY CHAIN DEPUTY
SAFRAN AIRCRAFT ENGINES

Aero Engine Industry Burning Platform

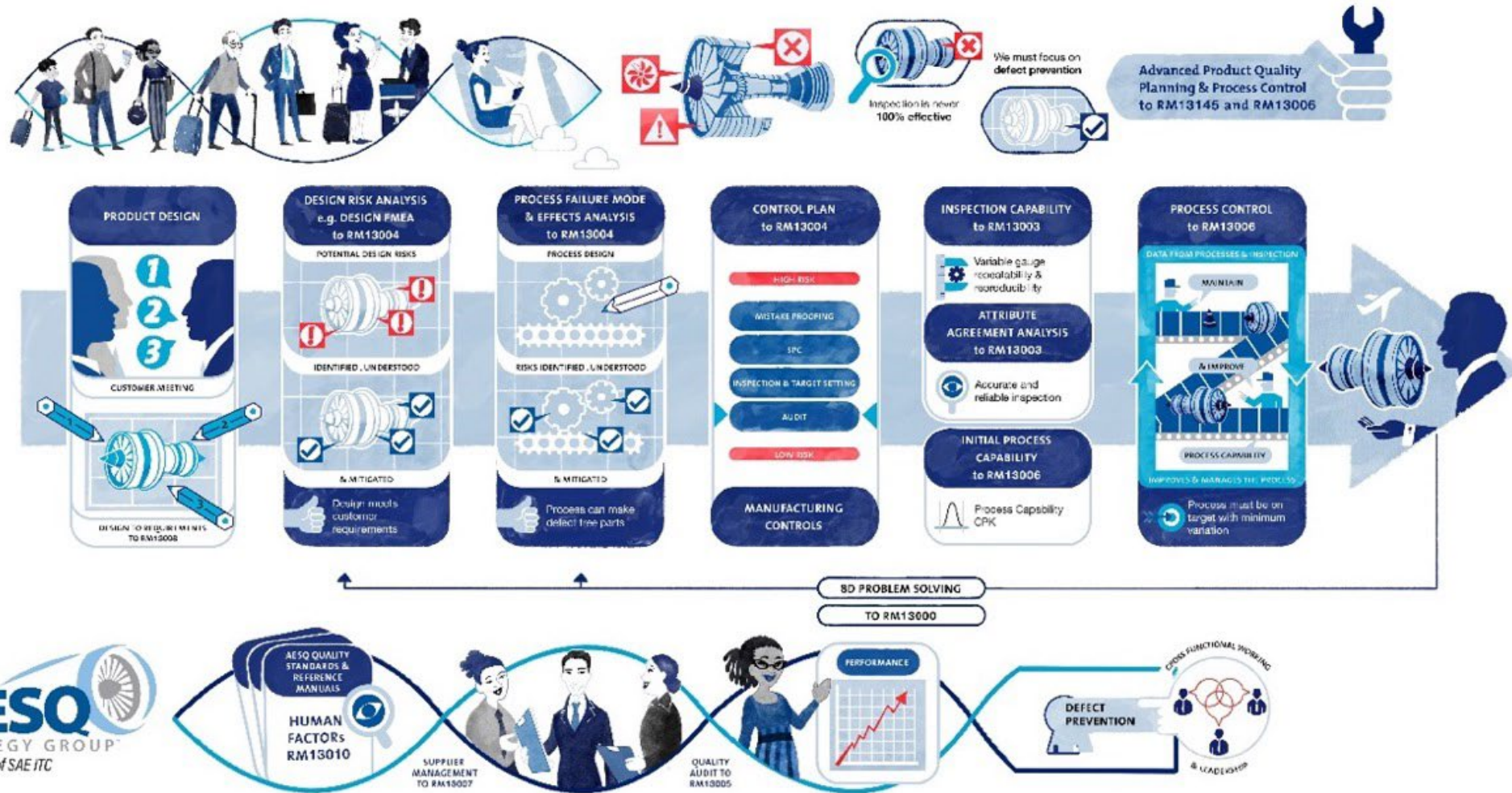
Aero Engine Manufacturers created a Collaboration working group to address burning platform in 2013 with key Global Suppliers

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



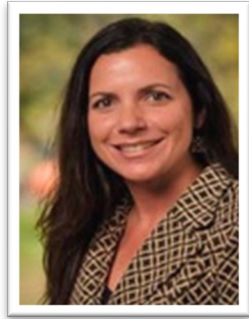
AESQ Members

Cincinnati Thermal Spray
Consolidated Precision Products
Meggitt PLC
Solar Atmospheres

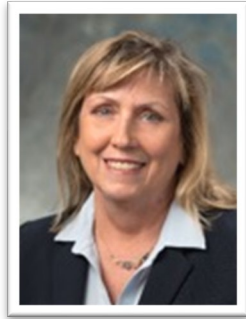
AESQ – Aerospace Engine Supplier Quality Strategy Group

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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



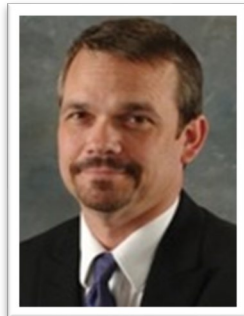
Uzam Khan
Supplier Quality Executive
Rolls-Royce



Emmanuel Vivier
VP Manufacturing & Supply
Chain Deputy
Safran Aircraft Engines



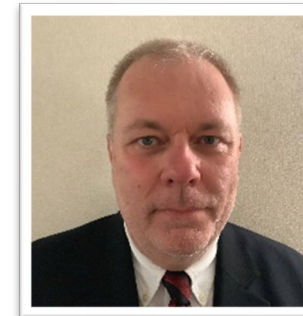
Jun Sakai
Chief Engineer
IHI Corporation



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.



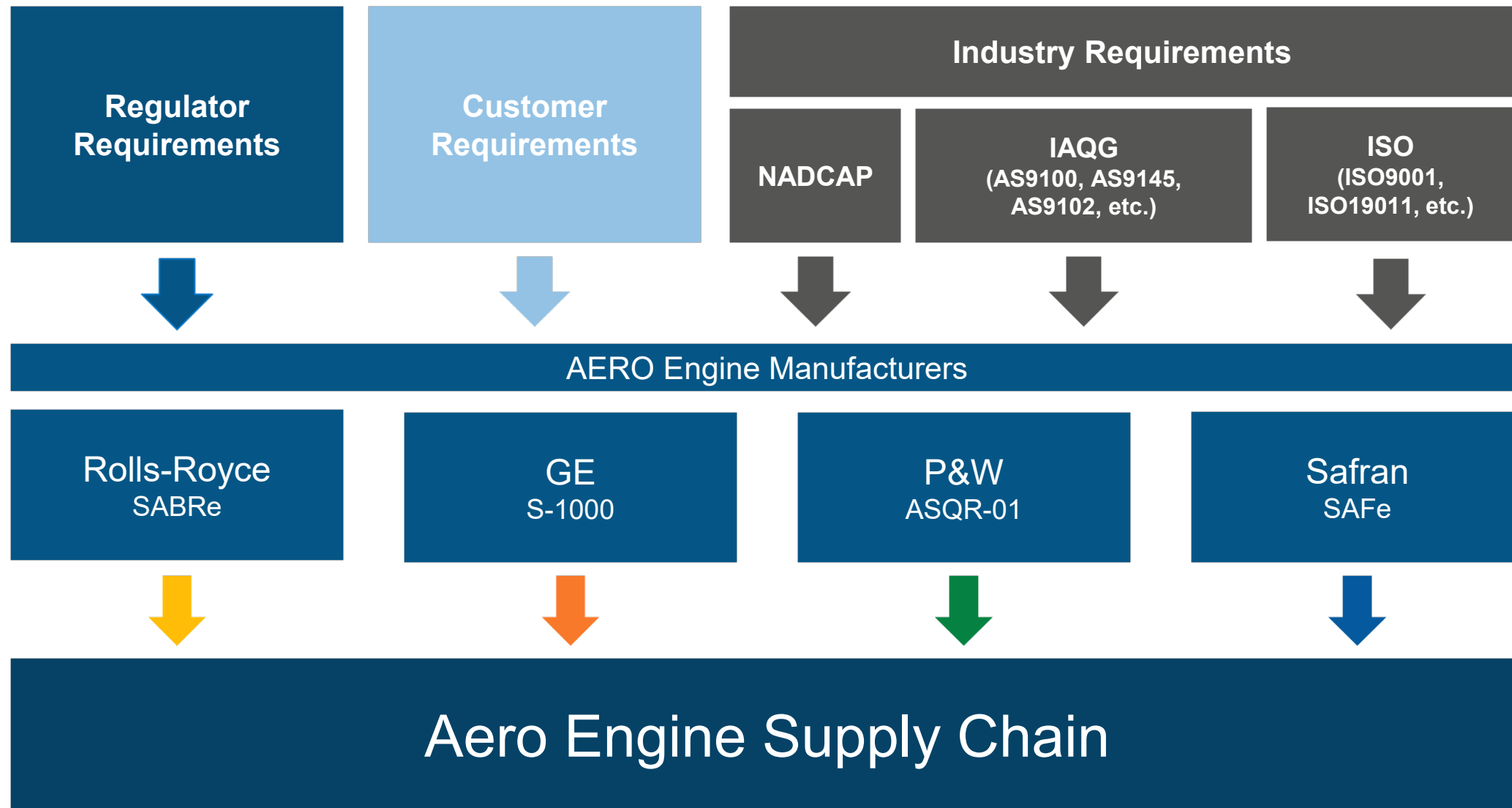
Osa Omoruyi
VP Quality
Howmet Engine Systems

AESQ – Aerospace Engine Supplier Quality Strategy Group

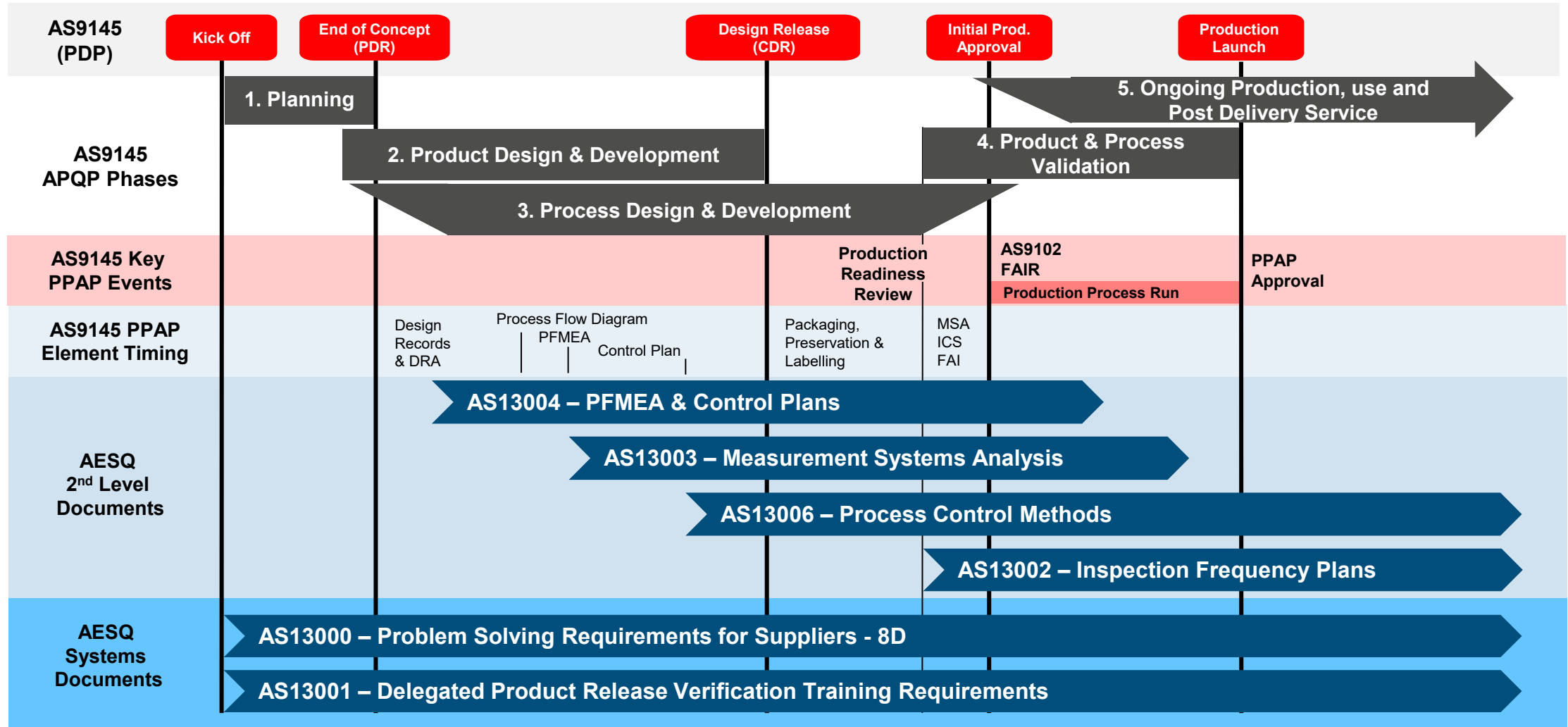
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To establish and maintain a common set of Quality Requirements that enable the **Global Aero Engine Supply Chain** to be truly competitive through lean, capable processes and a culture of Continuous Improvement.

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

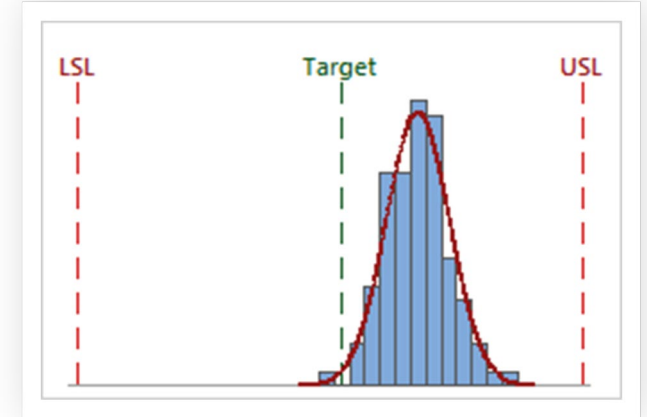


Fan Case Delivered Defect Free at PPAP after applying AS13004, AS13003 and AS13006

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

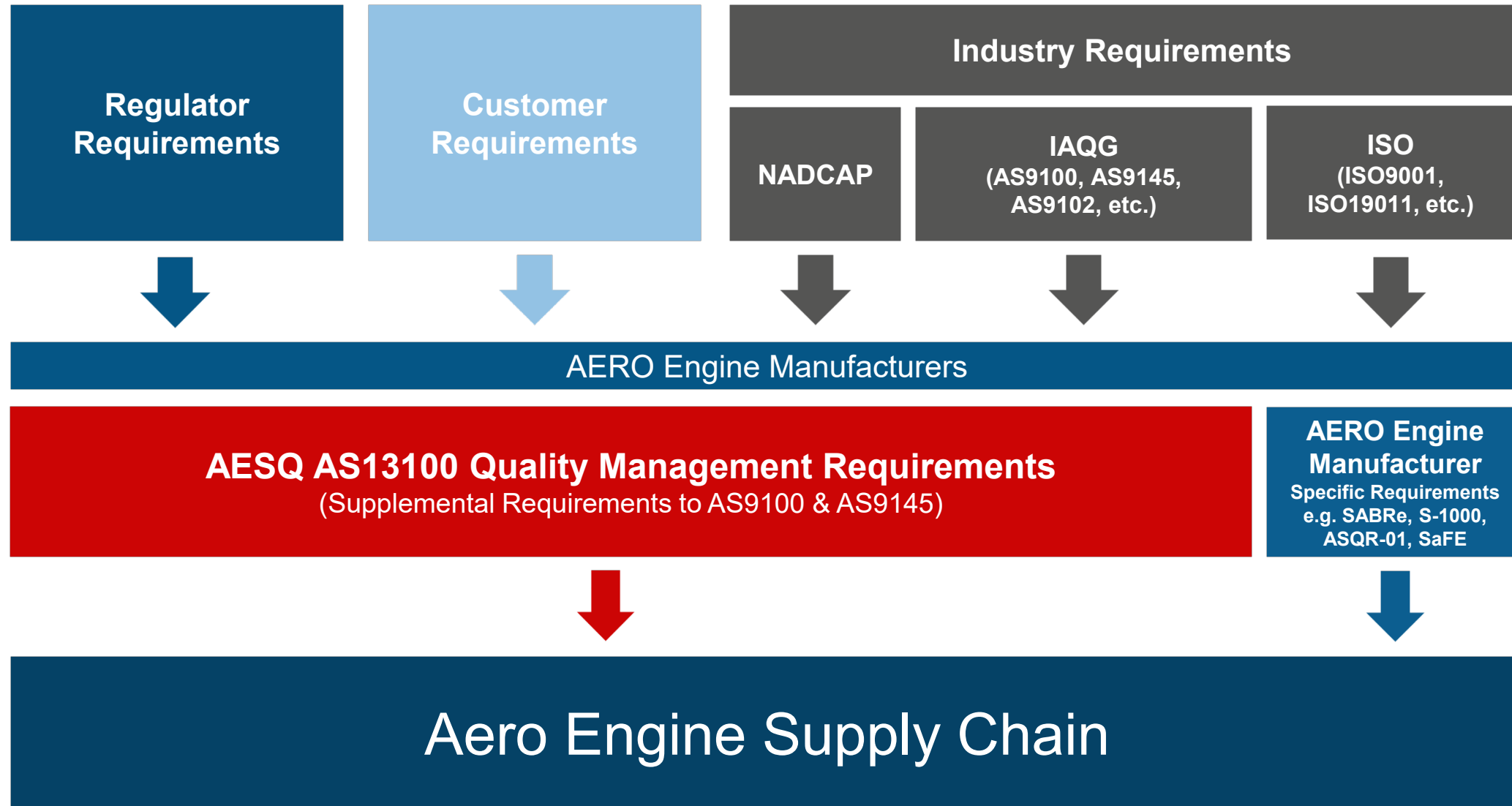
STRUCTURE & KEY HIGHLIGHTS



EARL CAPOZZI

ASSOCIATE DIRECTOR, DISCIPLINE CHIEF
QUALITY & PROCESS ENGINEERING
PRATT & WHITNEYSUPPLY CHAIN DIVISION

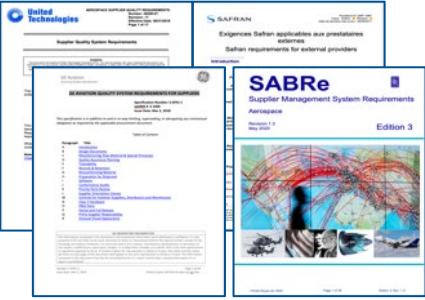
Aero Industry Requirements Future Vision



AS13100 Creation Process



OEM Unique Requirements



Future Engine Maker Supplier Requirements

Existing Engine Maker Supplier Requirements



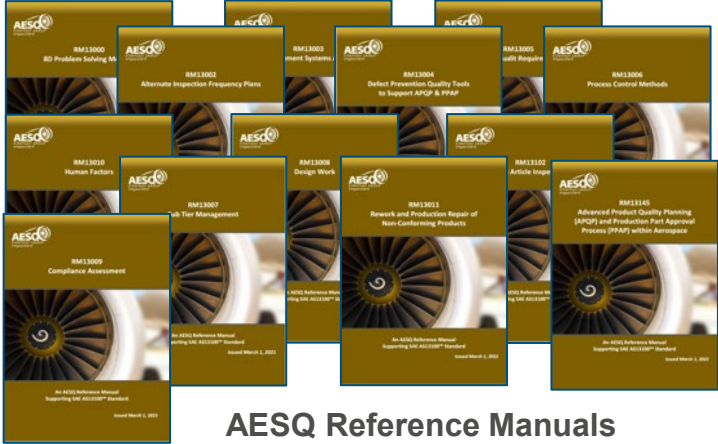
Overall Number of Requirements reduced by >50%

Starting Point September 2018



Requirements

Existing & WIP AESQ Standards



AESQ Reference Manuals

Supporting Guidance & Best Practice Material

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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 | |

| ORGANIZATION TYPE | QMS APPROVAL (MINIMUM REQUIREMENT) |
|---|--|
| Type 1: Make to Print and Type 2A: Design and Manufacture. 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. 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). As part of an Organizations manufacturing scope and/or Special Process Houses. | Nadcap or Customer's requirements. |
| Type 5: Raw Material. Manufacture, inspect, test, and certify the conformance of Raw Material to proprietary engineering specifications. | ISO9001 registration. |
| Production Shop Assist Only. 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. |

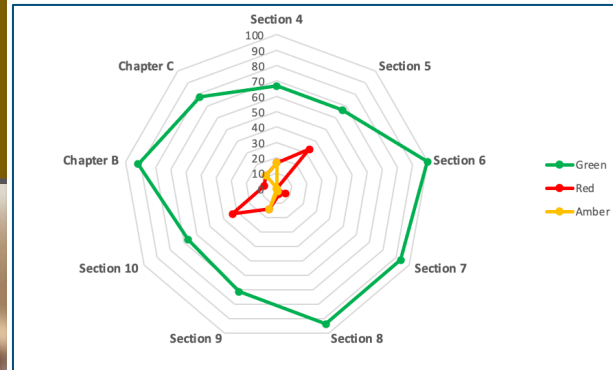
Table 1 provides a guide to the applicability of AS13100 Sections to Organization scope.

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

AS13100 Requirement Highlights

RM13009 Compliance Assessment

An AESQ Reference Manual Supporting SAE AS13100



| 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.

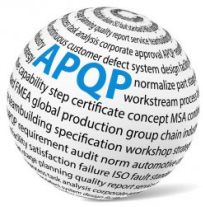
The results of this review are to be provided to the customer upon request.

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

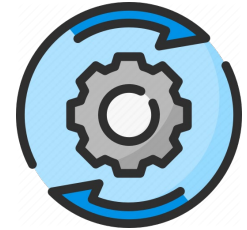


Requires the use of
Cross Functional
Teams for Design &
Development
Activities



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.



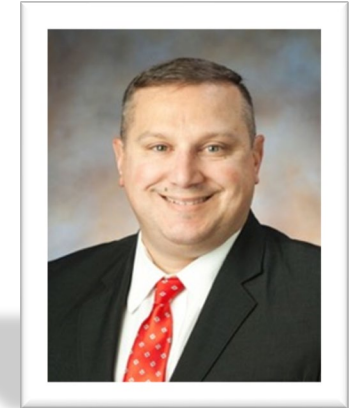
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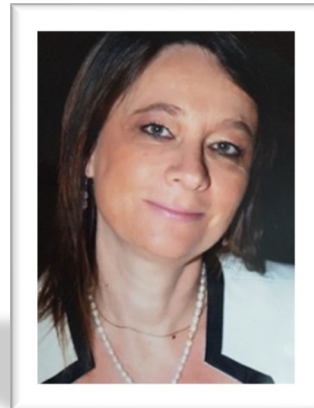
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Jim Wilson
Pratt & Whitney Canada



Catherine Catarina-Graca
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AESQ – Aerospace Engine Supplier Quality Strategy Group

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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
Björkålv Håkan
Brian Murphy
Carrie Sharkey
Catherine Belgacem
Catherine Catarina-Graca
Charles Barry
Chip Svoboda
Chris Bishop
Chris Craig
Dave Goldberg
Earl Capozzi
Ed Briggs
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Hector Mata-Collado
Helmut Weitmann
Herelio Munoz-Morales
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Ian Riggs
Inger Henström
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Jim Nelson
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Susie Neal
Sverker Johnson

Thomas Herter
Thomas Schmitt
Tobias Kranz
Todd Angus
Tony Pailing
Vince Miller
Ward Baun
Wilibald Schoder
Wolfgang Wagner
Yvonne Mansson

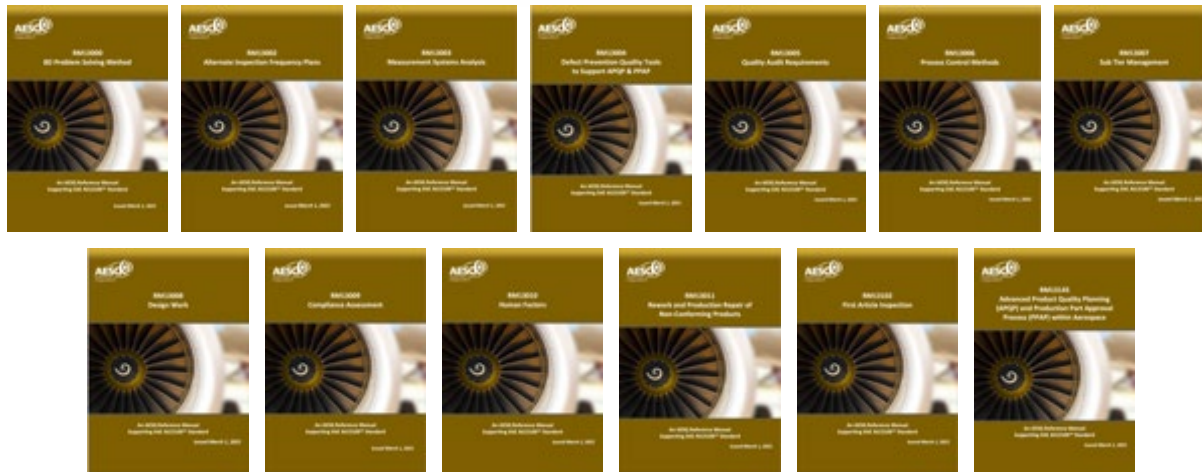


AS13100 Supporting Reference Manuals



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

AESQ – Aerospace Engine Supplier Quality Strategy Group

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AS13100 DEPLOYMENT INTRODUCTION & MILESTONES



ELIZABETH PACE

ASSOCIATE DIRECTOR, SUPPLIER QUALITY
RAYTHEON TECHNOLOGIES

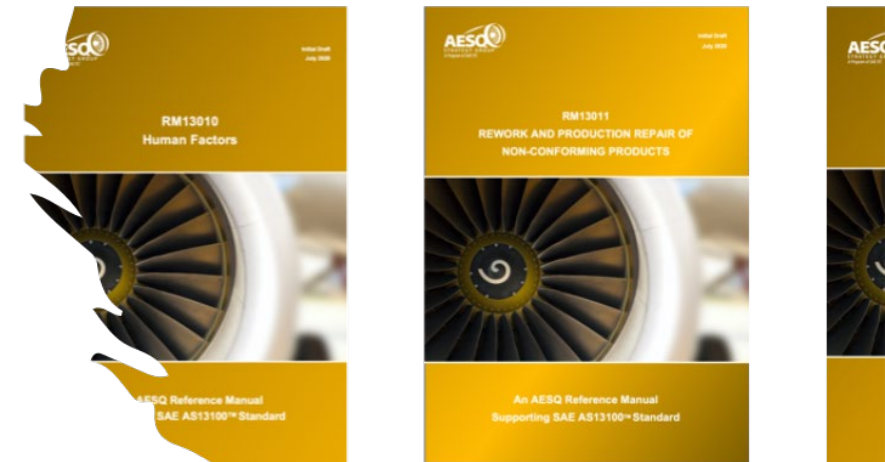
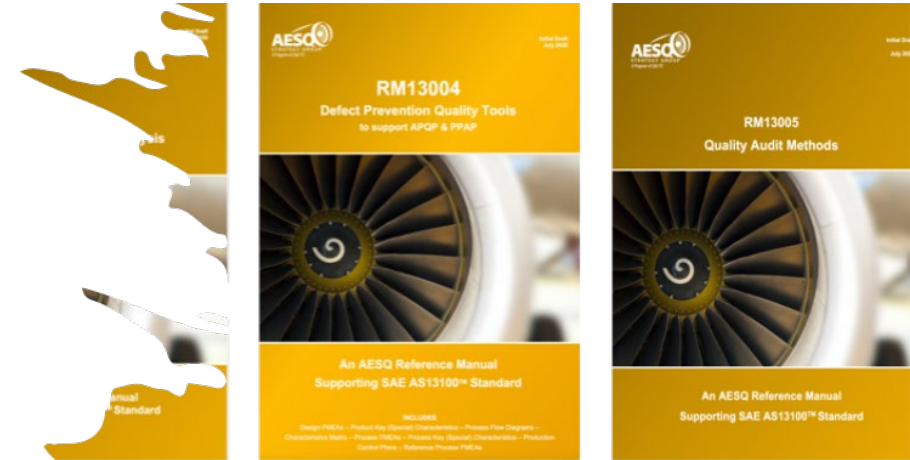
AESQ Released AS13100



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

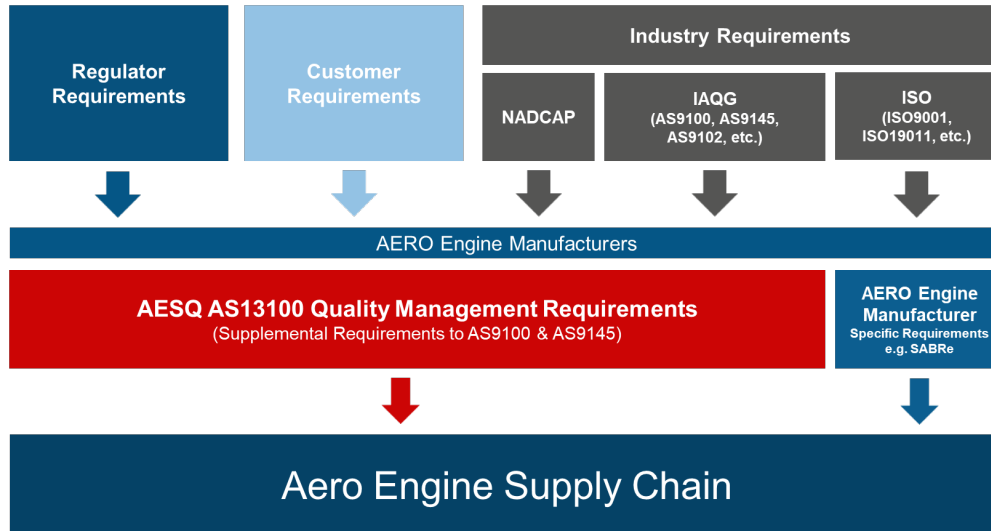
- Removal of duplicate / redundant requirements
- Builds on existing Aerospace Industry Standards where appropriate

Setting higher standards for Quality

- Adopt best practice from across industry
- Standards written by industry practitioners
- Challenging current acceptance thresholds – “raising the bar of quality performance”

Acceleration of Supplier Quality Capability Improvement

- Aligned Supplier Development activities using Common Quality Tools
- Availability of Global training and consultancy providers aligned to AESQ requirements



Committed to AS13100 Compliance on December 31, 2022



AESQ – Aerospace Engine Supplier Quality Strategy Group

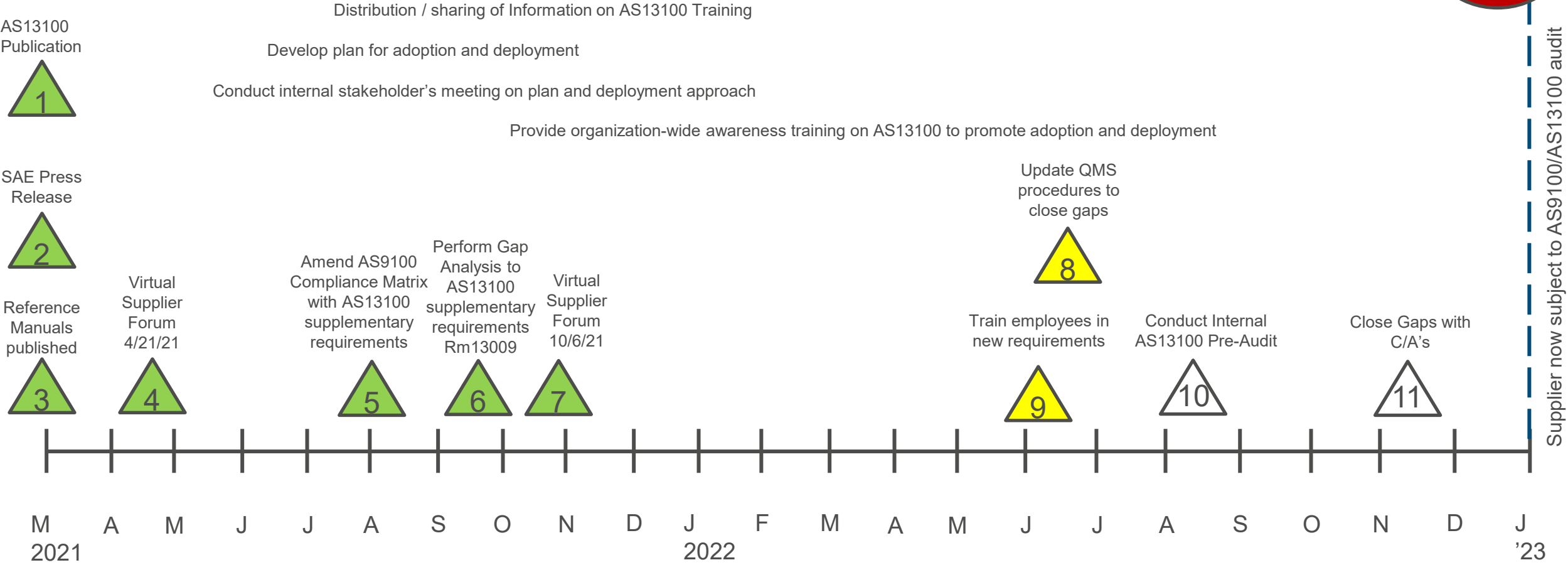
This document slide does not contain ITAR or EAR technical data. The content of this presentation slide is proprietary and confidential information of the AESQ. It is not permitted to be distributed to any third party without the written consent of the AESQ.

AS13100 Supplier Preparation Milestone Plan

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



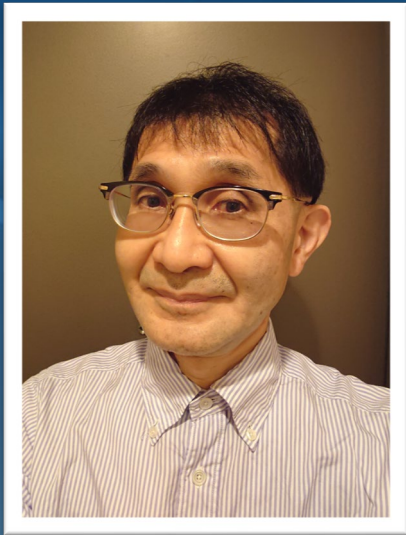
AS13100 Requirements now in effect



AESQ – Aerospace Engine Supplier Quality Strategy Group

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

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)



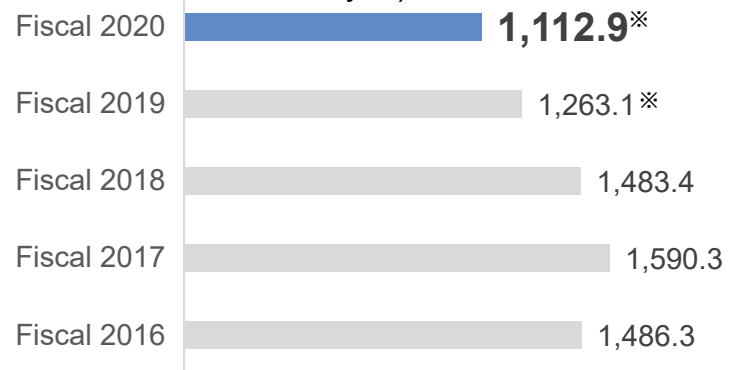
Branches in Japan
8



Overseas affiliates
143
[Subsidiaries: 121 Affiliates: 22]

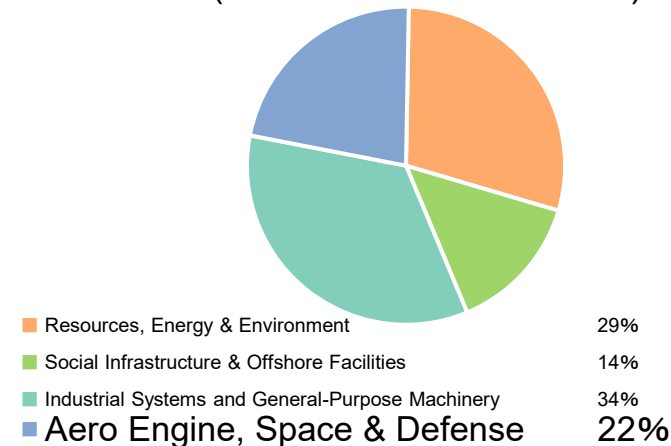
Net sales/Revenue

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 Compositions by business areas (Consolidated/fiscal 2020)



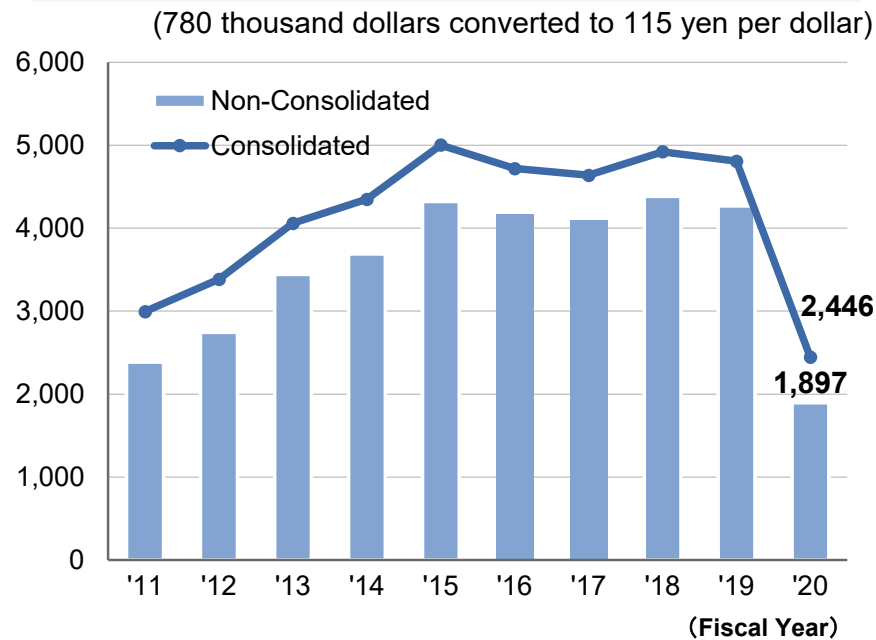
Note : The total may not be 100% owing to the exclusion of "Other" and "Adjustments".

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

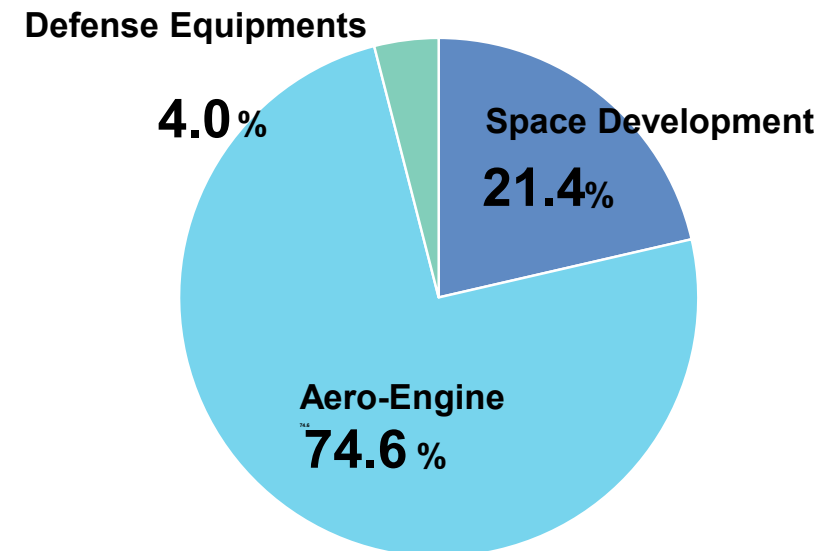
| | | |
|---|---------------------------|-----------------------------------|
| President of Business Area | | Hideo Morita |
| | | Managing Executive Officer |
| Employees (as of March 31, 2021) | (consolidated) | 6,765 |
| | (non-consolidated) | 4,212 |

| | |
|----------------------------|--|
| Operation divisions | <ul style="list-style-type: none"> ● Defense Systems Div. ● Civil Aero-Engine Div. ● Space Development Dept. ● Research & Engineering Div. ● Manufacturing Div. ● Life Cycle Solution Div. |
|----------------------------|--|

Annual Sales (Unit: 100 million yen)

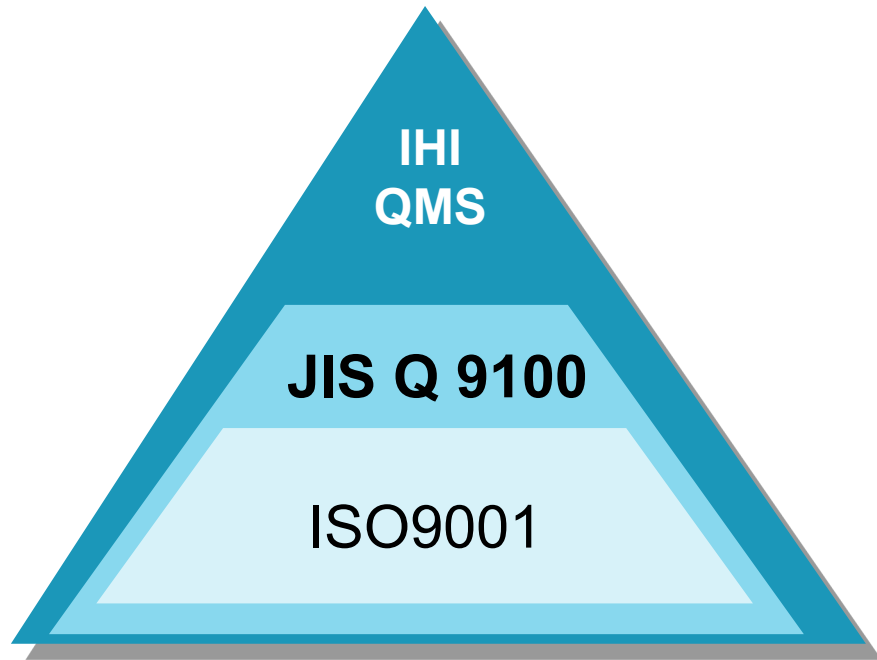


Consolidated Sales Ratio (In fiscal 2020)

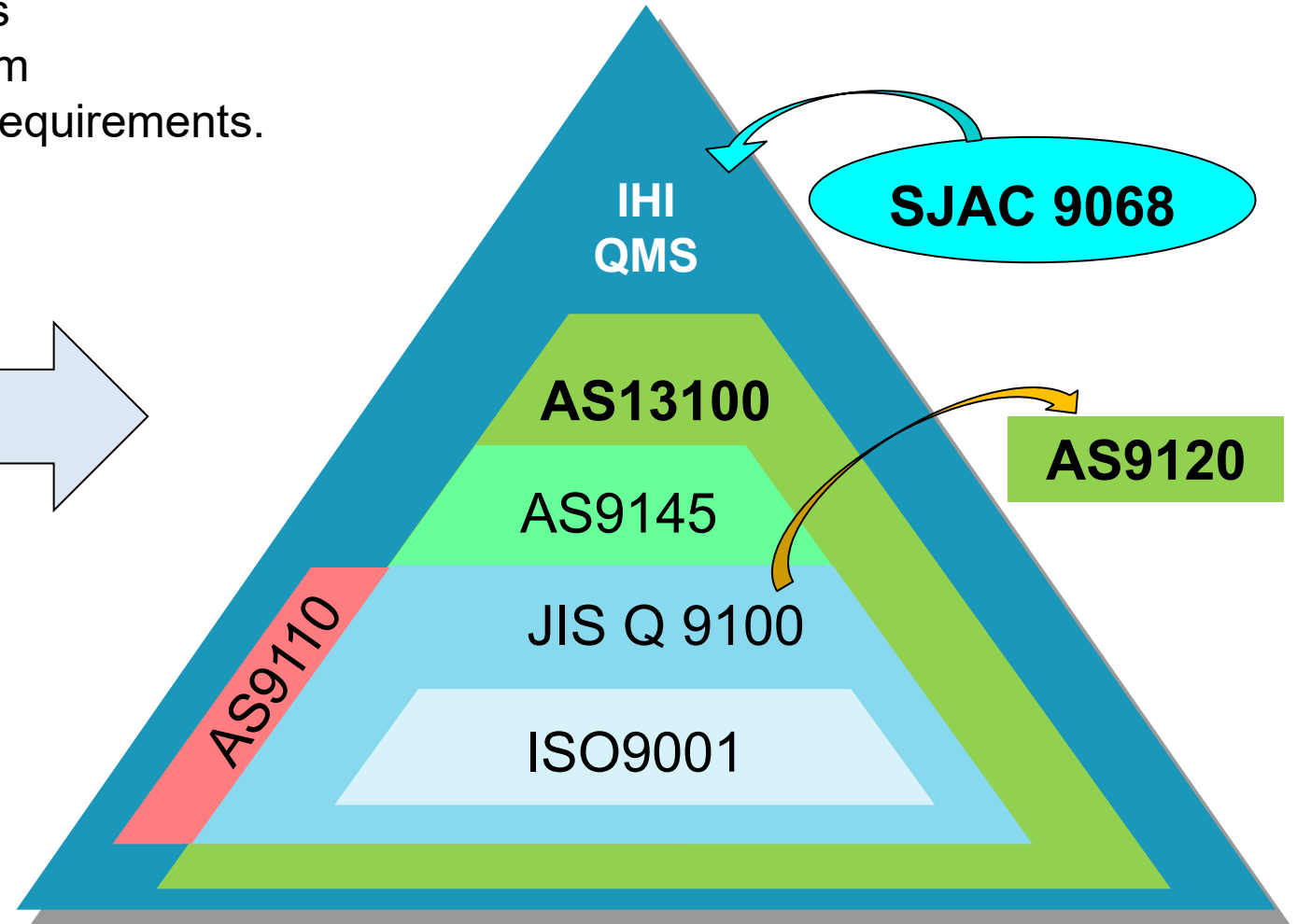
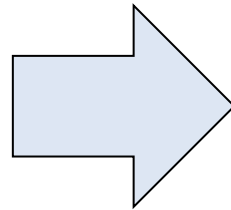


3. IHI Quality Management System Architecture

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



Previous Architecture



Current Architecture

4. Deployment Strategy Group dashboard

| Company | Milestone e 1 | Milestone e 2 | Milestone e 3 | Milestone e 4 | Milestone 4b | Milestone e 5 | Milestone e 6 | Milestone e 7 | Milestones |
|-------------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|---|
| GE Aviation | Complete | Complete | Complete | Complete | Complete | In Work | In Work | | Milestone 7: AS13100 compliance by supply base |
| GKN Aerospace | Complete | Complete | Complete | Complete | Complete | In Work | In Work | | Milestone 6: Training plan executed to supply base |
| Honeywell | Complete | Complete | Complete | Complete | | | | | Milestone 5: Training plan executed internally |
| Howmet | Complete | Complete | Complete | In Work | In Work | In Work | In Work | | Milestone 4b: Flow down of the Standard to the supply base. |
| IHI | Complete | Complete | Complete | Complete | In Work | In Work | | | Milestone 4: Communication plan executed to supply base. |
| MTU | In Work | Complete | Complete | Complete | In Work | In Work | | | Milestone 3: Communication plan executed internally. |
| PCC | In Work | In Work | In Work | | | In Work | In Work | | 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.) |
| Pratt and Whitney | Complete | Complete | Complete | Complete | In Work | | | | Milestone 1: GAP analysis being conducted. Member company committed to deployment by Dec 2022. |
| Rolls Royce | In Work | Complete | Complete | Complete | Complete | In Work | In Work | | |
| Safran | Complete | Complete | In Work | In Work | In Work | In Work | | | |

■ Complete ■ In Work

December 31, 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

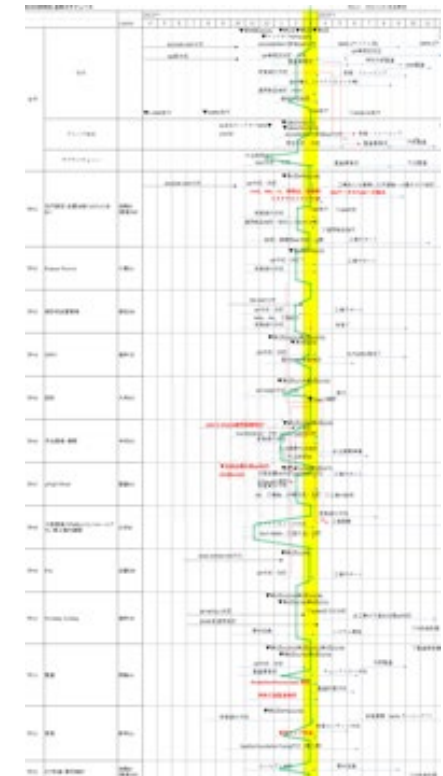
| | 2021FY | | | | | | | | | | | | 2022FY | | | | | | | | | | | |
|--------|---------------------|---|---|---|---|---|----|--|----|---|---|---|--------------------------------------|---|---|---|---|---|----|----|----|--|--|--|
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | | |
| IHI | AS13100GAP analysis | | | | | | | AS13100/RM GAP analysis | | | | | Revise Quality procedure as needed | | | | | | | | | | | |
| | Create quality plan | | | | | | | Create / Revise Quality procedure | | | | | QMS activity (1 st cycle) | | | | | | | | | | | |
| | | | | | | | | ▽Kick Off | | | | | 2 nd Cycle | | | | | | | | | | | |
| | | | | | | | | Training Auditors | | | | | Extra internal Audit | | | | | | | | | | | |
| | | | | | | | | Purchasing materials (spectrometer etc.) | | | | | Customer review / Audit | | | | | | | | | | | |
| | | | | | | | | Create education material | | | | | Education / training | | | | | | | | | | | |
| | | | | | | | | | | | | | Extra MR▽ | | | | | | | | | | | |
| S C | | | | | | | | ▽Introduction to IHI group companies | | | | | | | | | | | | | | | | |
| | | | | | | | | ▽Introduction to supplier | | | | | | | | | | | | | | | | |
| | | | | | | | | Create / Revise purchase documents | | | | | Training Auditors | | | | | | | | | | | |
| | | | | | | | | | | | | | Supplier Audit | | | | | | | | | | | |

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

7. AS13100 Deployment strategy

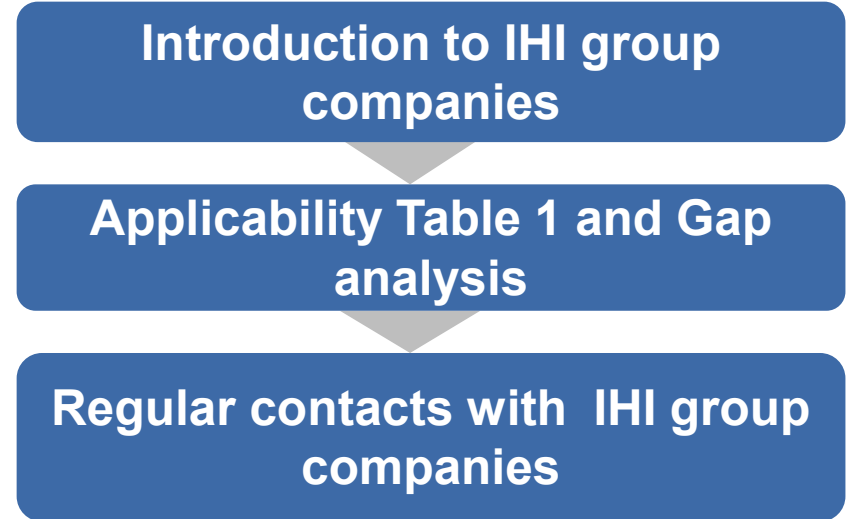
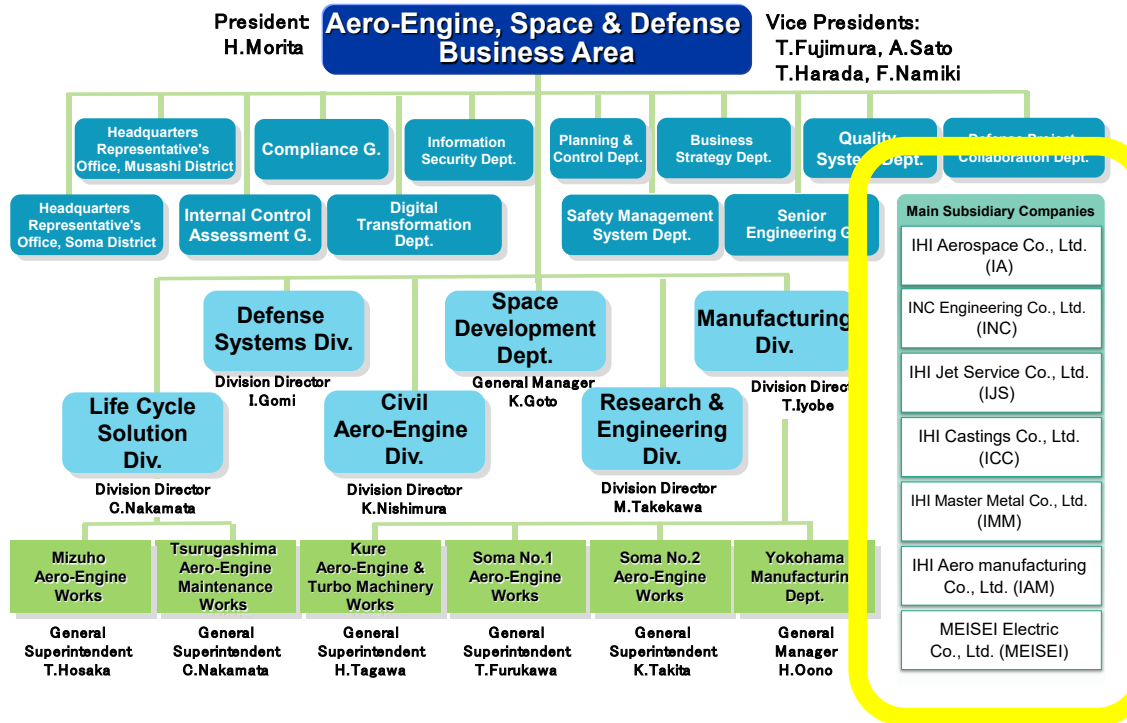
We are organizing a team and promoting the creation of IHI quality management system based on AS13100 Requirement.

| 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



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



DRIVEN BY VISIONS
OF TOMORROW

AS13100 Implementation Plan @ MTU

MTU AERO ENGINES AG – Michael Mrosewski



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, ...

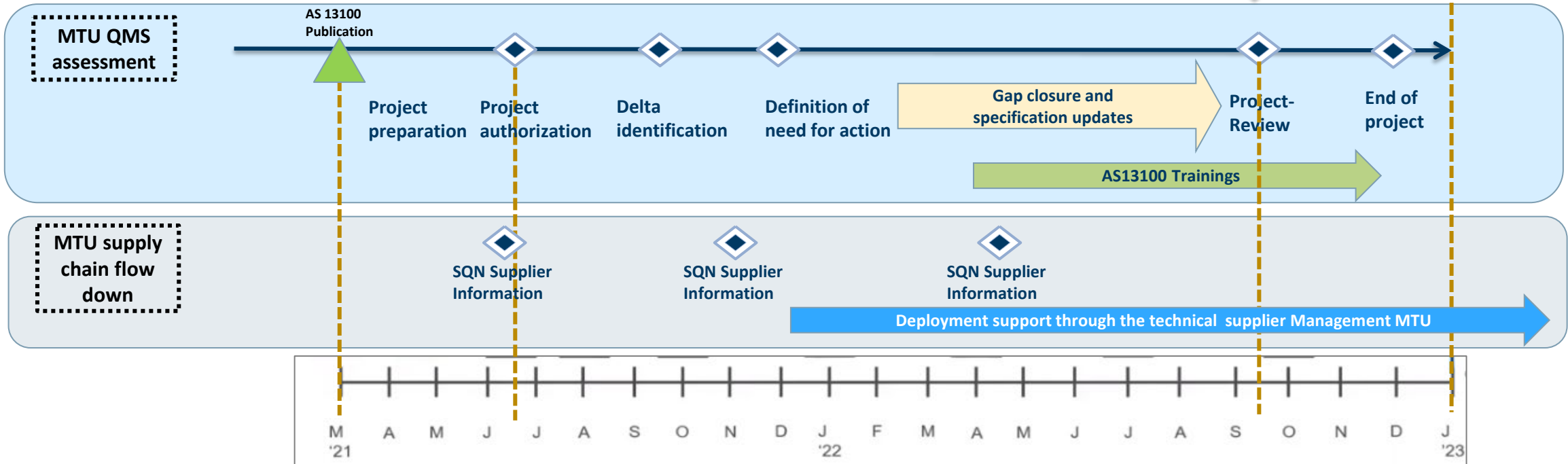
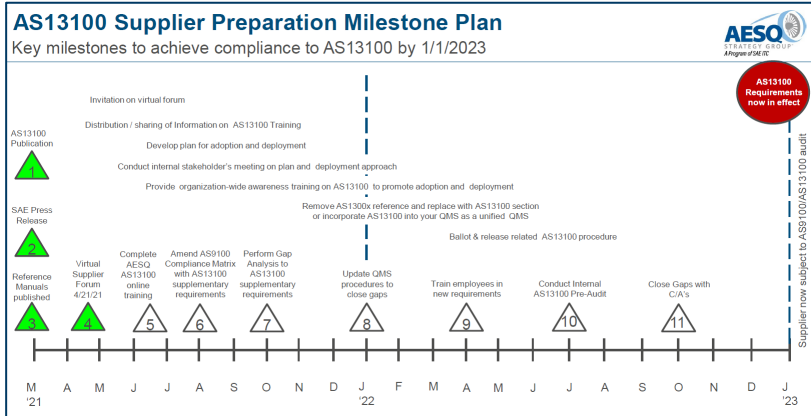
→ Core team is extended where needed, depending on the relevant topics.

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: |

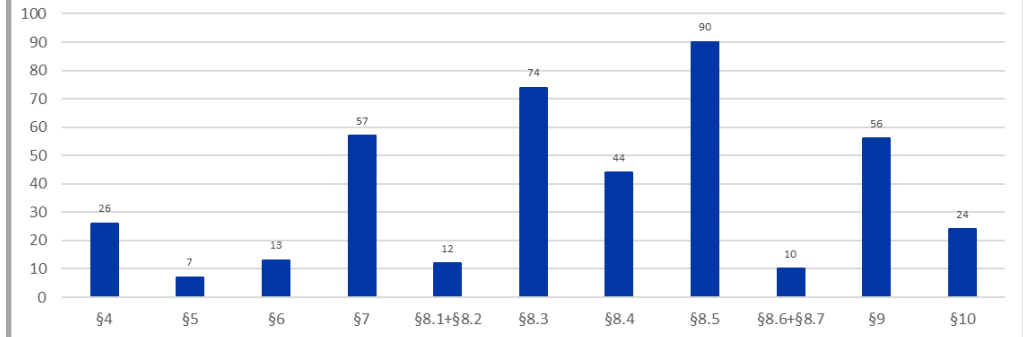
Self Assessment Compliance Status Key

- Not Compliant 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 | | |

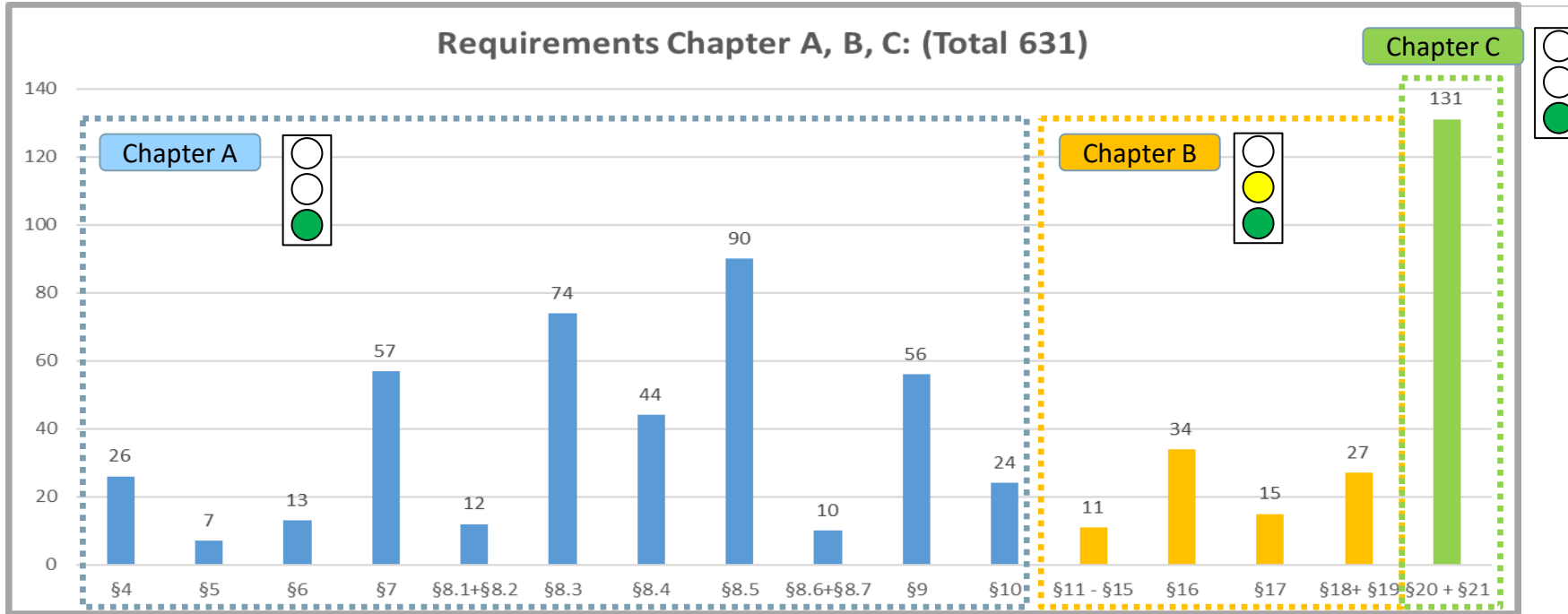
Example

Requirements Chapter A: (Total 413)



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 |



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**

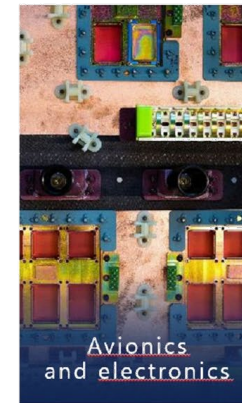
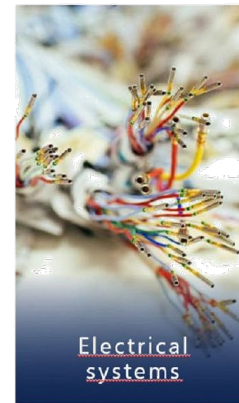


SAFRAN GROUP Activities

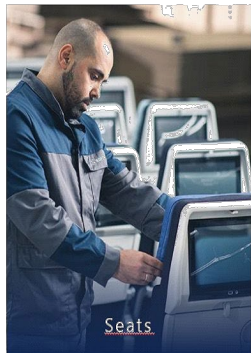
Aircraft propulsion: proven innovation and reliability to support aircraft manufacturers and airlines



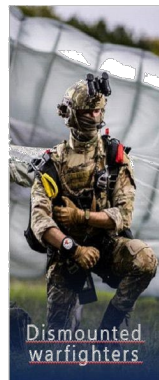
Aircraft equipment: a complete range of products and services



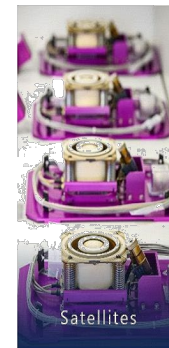
Aircraft interiors: an extended range for all types of aircraft to enhance passenger comfort



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

- 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) |

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

GRM-0123
Provider Handbook

GRF-0033
Compliance matrix to requirements

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

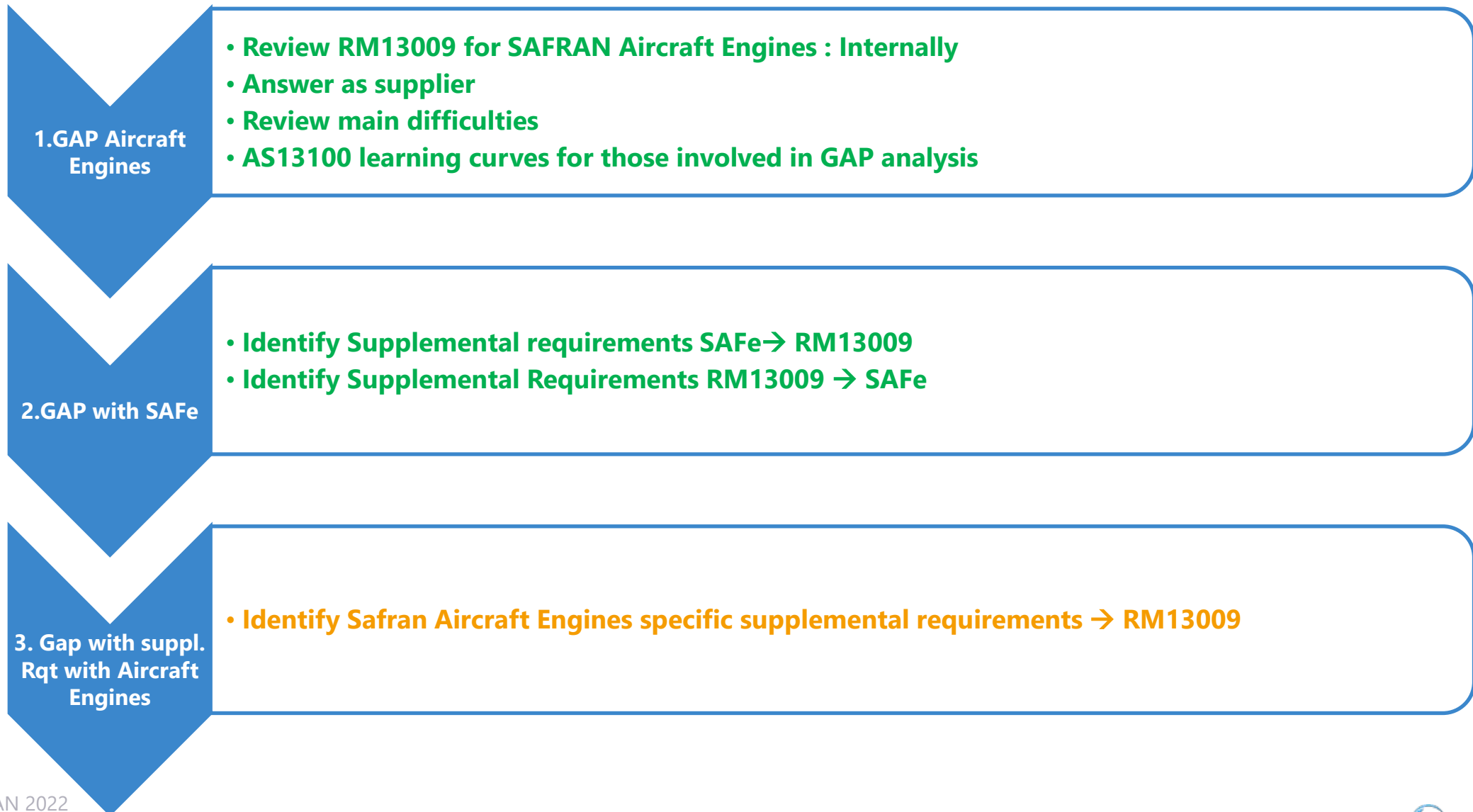
Milestone 4: Communication plan executed to supply base.

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**



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 :

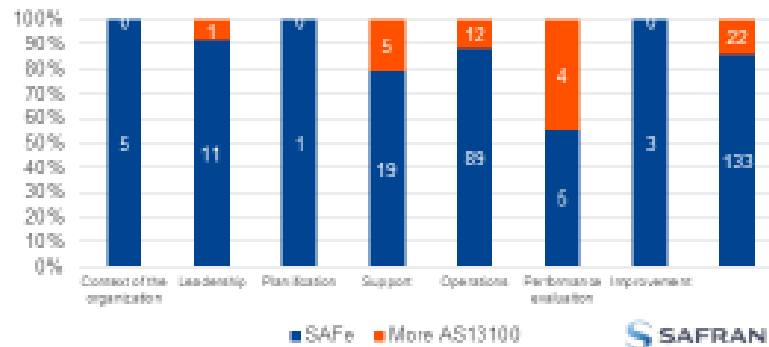
8.3.3.3 The organization shall configure and plan Design Reviews appropriate to the project considering magnitude, complexity, novelty, risk, etc., (8.3.4.3) and include those milestone dates in the design and development plan.

MORE AS13100 (some elements in (8.3.3a + Chapter 12 (APP-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. Ils ne doivent pas être copiés ni communiqués à un tiers sans l'autorisation préalable écrite de 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 :

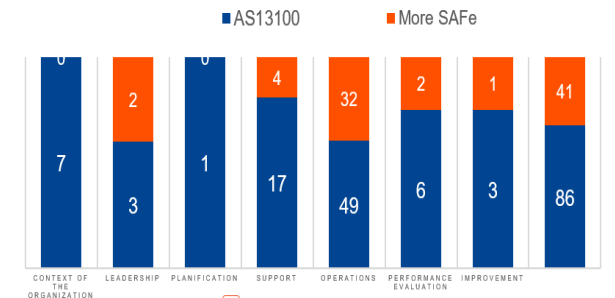
5.1.1e The Provider's commitment on these two items shall be formalized through the signing of Safran's Charter for Responsible Purchasing (document available onto Safran's Website under the reference GRF-0164). The Provider shall also initiate the invoices dematerialization to eliminate paper invoices.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

A

MORE SAFe

86 common AS13100 requirements (represented by "AS13100")

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



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)

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 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.

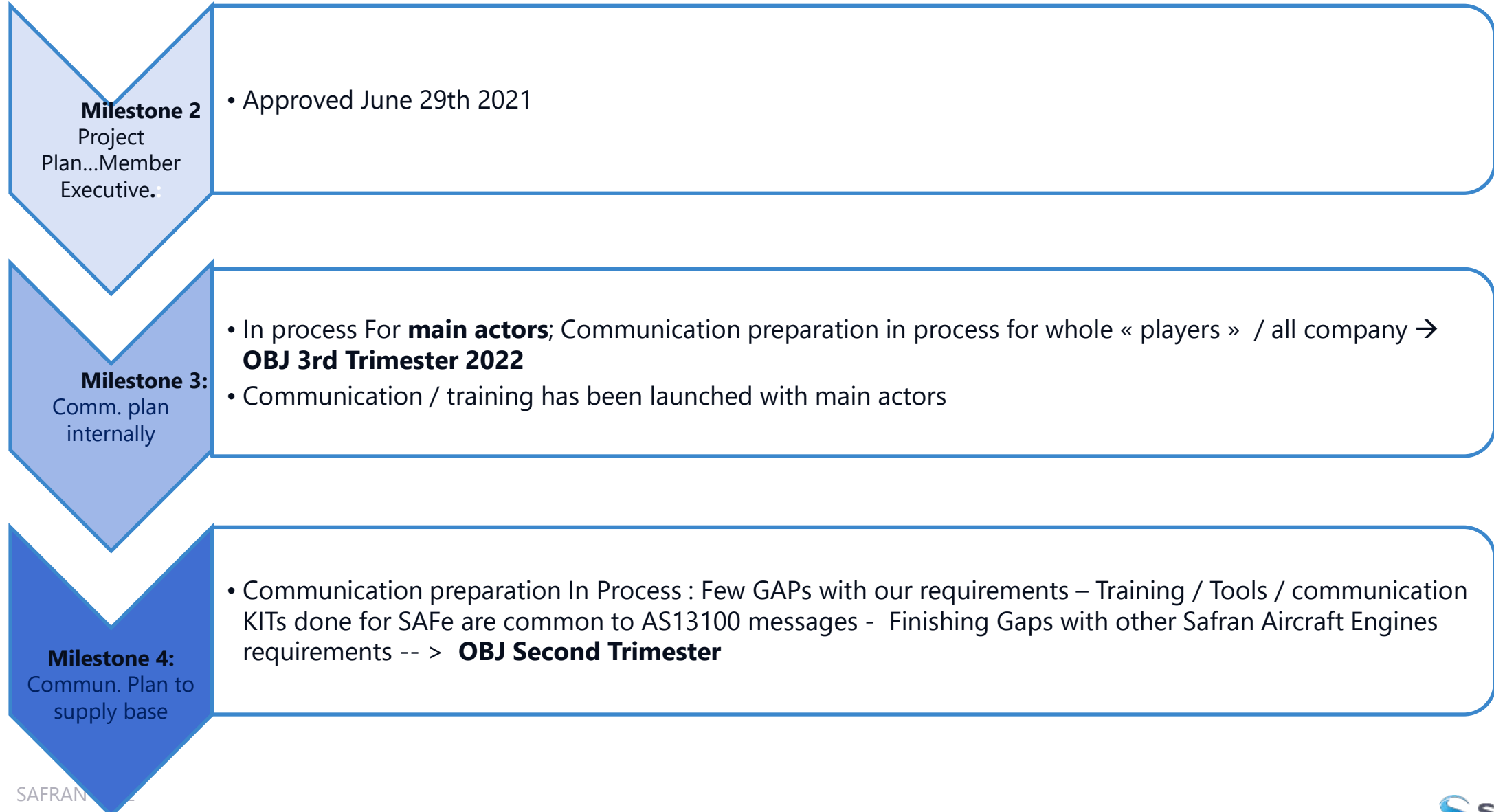
GRF-0033
Compliance matrix to
SAFe requirements

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**



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

Milestone 5
Training plan
executed internally

- Already started with main Actors but will be extended 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



GREG HYATT

SUPPLIER METALLURGICAL CONTROL SPECIALIST - JAPAN
ENGINEERING / SUPPLIER QUALITY
PRATT & WHITNEY

TRANSITION OF ASQR-01 -> AS130XX

ASQR JOURNEY HAS PROGRESSED, AND NOW IS 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

SAE INTERNATIONAL
AEROSPACE STANDARD
AS13100™
 Issued 2021-03
 AESQ Quality Management System Requirements for Aero Engine Design and Production Organizations

RATIONALE
 This standard has been created by the SAE G-22 Aerospace Engine Supplier Quality (AESQ) Technical Committee to harmonize and simplify supplier quality requirements that are in addition to the requirements of AS1300 Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations and S142 Advanced Product Quality Planning and Production Part Approval Process.

FOREWORD
 To assure customer satisfaction, the aviation, space, and defense industry organizations have to produce and continually improve safe, reliable products that equal or exceed customer and regulatory authority requirements.

AS13100 Compliance Self Assessment Chapter A

| | | | |
|--------------------|---|----------|-----------|
| Organization Name: | Pratt and Whitney | Date: | 10/9/2021 |
| Completed By: | J. Massicot/T. Carpenter/E. Capozzi/S. Shilberg/P. T. | Version: | Initial |

Self Assessment Compliance Status Key

- Red: Not Compliant with the requirement, No Plan in place to resolve.
- Yellow: Not compliant but there is a plan in place with a scheduled completion date.
- Green: Fully compliant to all points identified under each clause and referenced in the Management System.
- Black: 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 | T&C/PWA-001/ASQR-01 (Page 8, 4.2.6) | C |
| 4.1 | Understanding the needs and expectations of interested Parties - Supplemental Requirements | INTERNAL: Management System Manual EXTERNAL: ASQR-01 | C |
| 4.1.1 | Determining the scope of the quality management system - Supplemental Requirements | INTERNAL: Mgt Sys for N/A as PWA does not develop product software but buys it (e.g. Catia/PLM software) EXTERNAL: ASQR-01 5 | C |
| 4.1.2 | Deliverable Software | INTERNAL: PWA registered by 951 | C |
| 4.1.3 | Identification Body and scope | INTERNAL: ASQR-01 EXTERNAL: PWA access controlled by Seat W/Access/DCAM has access to any PWA OASIS system | C |
| 4.1.4 | Access to OASIS and NADCAP Databases | INTERNAL: ASQR-01 INTERNAL: PWA has compliance matrix (supplemental & OASIS) also completing (RM13000 matrix) EXTERNAL: Resolution Eagle Eye to inform supplier to complete RM13000 compliance matrix & gap analysis | A |
| 4.1.5 | Compliance Matrix & Scope | INTERNAL: Resolution Eagle Eye to inform supplier to complete RM13000 compliance matrix & gap analysis | A |

AS13100 Chapter A | Results Chapter B | Results Chapter C | Results Table | Results Chapter | Compliance Plan | Version Control

United Technologies
 AEROSPACE SUPPLIER QUALITY REQUIREMENTS
 Number: ASQR-01
 Revision: 1.6 7/7/20
 Effective Date: 6/24/2018
 Page 1 of 17

Supplier Quality System Requirements

INTRODUCTION
 This document defines supplier quality requirements as agreed upon by the following business entities herein referred to as "Member".

| | |
|------------------------|------|
| Pratt & Whitney | PW |
| Pratt & Whitney Canada | PWC |
| UTC Aerospace-Systems | UTAS |

This document has been developed based upon the requirements of the International Aerospace Quality Group (IAQG) AS9100 - Quality Management Systems - Requirements for Aviation, Space and Defense Organizations. This document identifies unique requirements for RTX UTC Member companies.

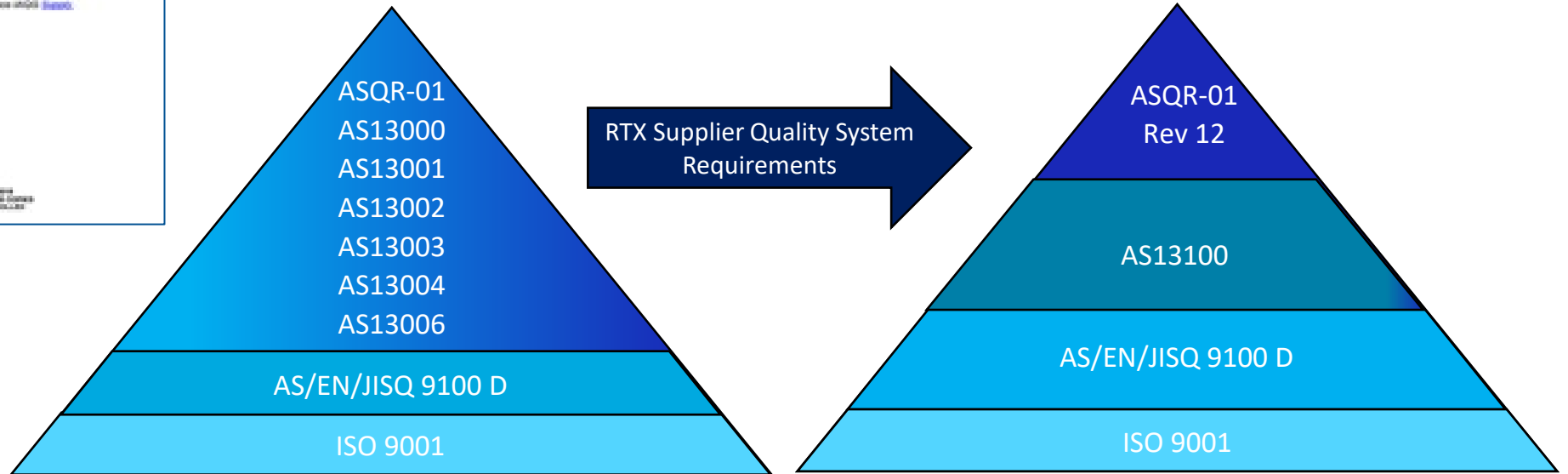
When a supplier provides product or service to more than one Member, the requirements contained herein are to be uniformly applied for each individual Member.

Note: For guidelines on implementing supply chain best practices, reference IAQG Supply Chain Management Handbook (SCMH).



TRANSITION OF ASQR-01 -> AS13100

ASQR JOURNEY HAS PROGRESSED, AND NOW IS INFLUENCED BY AS13100



TRANSITION OF ASQR-01 -> AS13100

ASQR JOURNEY HAS PROGRESSED, AND NOW IS INFLUENCED BY AS13100

ASQR-01 Revision 12

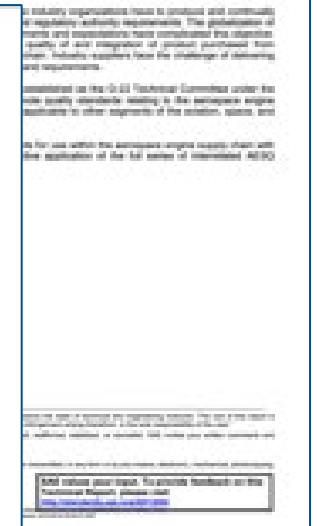
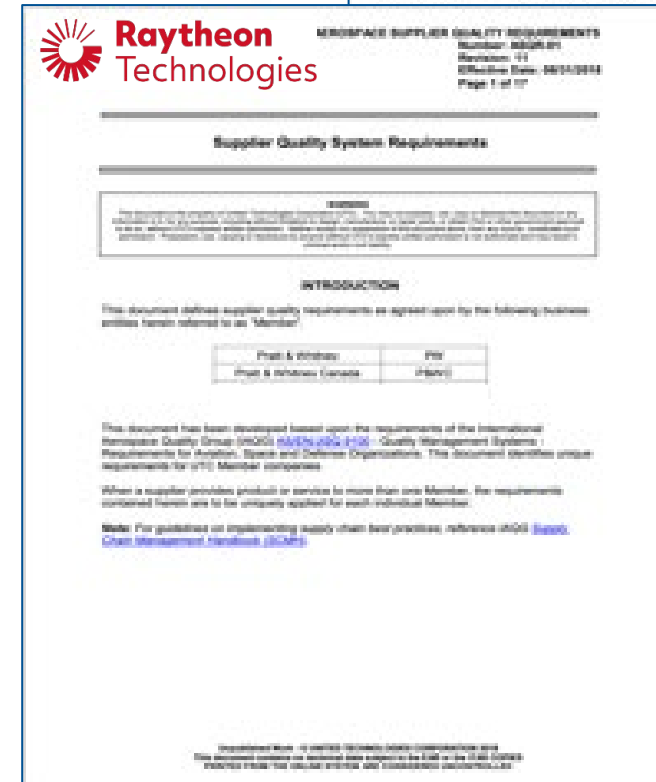
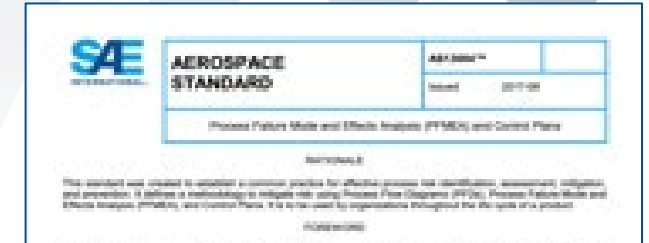
Current requirements of ASQR-01 Rev 11 at **174** pages forecast to drop to **102** pages, a 41% reduction.

“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.

EAGLE EYES


Quality Lessons Learned

Applicability:
 Pratt & Whitney Pratt & Whitney Canada

AESQ PUBLISHES AS13100 SUPPLEMENTARY REQUIREMENTS TO AS9100 – ANN



SUPPLIER QUALITY



**Eagle Eye
Lessons Learned**

Applicability:
 Pratt & Whitney Pratt & Whitney Canada

AS13100

Pratt and Whitney will be requiring the deployment and implementation of the new AS9100 quality system *System Requirements* by the Aerospace Engine Division. **AS13100 as defined in customer-specific quality requirements** between engine manufacturer and Pratt & Whitney's partner Engines, we recommend the Forum on Wednesday October 19, 2022, at 11:00am EST (-5GTM) to review the new requirements and the free supplier implementation of this new standard. For more information, go to the AESQ website (<http://www.aesq.org>), videos, templates, and other resources.

As Pratt & Whitney's partner Engines, we recommend the Forum on Wednesday October 19, 2022, at 11:00am EST (-5GTM) to review the new requirements and the free supplier implementation of this new standard. For more information, go to the AESQ website (<http://www.aesq.org>), videos, templates, and other resources.

For any questions, feel free to contact:
 Earl Capozzi, Global Supply earl.capozzi@prattwhitney.com
 Pete Teti, Technical Fellow, peter.teti@prattwhitney.com

No. 21-13

| Time/Date | Agenda Topic |
|---|---|
| 2022 - February 22, 24 8:00am-10:00am EST (Tues/Thurs) 1:00pm-3:00pm EST (Tues/Thurs) | - Timeline of Expectations - Completing the RM13009 Self-evaluation - RM13009 results of P&W - ASQR-01 revision 12 update |
| 2022 - Apr 12, 14 8:00am-10:00am EDT (Tues/Thurs) 1:00pm-3:00pm EDT (Tues/Thurs) | - Q&A Session – Gap Assessment - Scope of applicability for P&W suppliers |
| 2022 - May 24, 26 8:00am-10:00am EDT (Tues/Thurs) 1:00pm-3:00pm EDT (Tues/Thurs) | - Q&A Session - Review the new ASQR01 / ASQR-01 Gap Assessment checklist - Training employees on new requirements - Conduct AS13100 & ASQR-01 internal Audit |
| 2022 - Jul 19, 21 8:00am-10:00am EDT (Tues/Thurs) 1:00pm-3:00pm EDT (Tues/Thurs) | - Validating closure of audit findings completed and ready for 1/1/23 |
| 2022 - Sep 20, 22 8:00am-10:00am EDT (Tues/Thurs) 1:00pm-3:00pm EDT (Tues/Thurs) | - Q&A Session – Topic to be determined based on Quality Mangers questions and feedback |
| 2022 - Nov 15, 17 8:00am-10:00am EST (Tues/Thurs) 1:00pm-3:00pm EST (Tues/Thurs) | - Q&A Session – Topic to be determined based on Quality Mangers questions and feedback |

Export Classification: [No Technical Data]
P&W PROPRIETARY INFORMATION

AS13100 DEPLOYMENT DASHBOARD



ELIZABETH PACE
ASSOCIATE DIRECTOR, SUPPLIER QUALITY
RAYTHEON TECHNOLOGIES

Deployment Strategy Group Dashboard



| Company | Milestone 1 | Milestone 2 | Milestone e 3 | Milestone e 4 | Milestone 4b | Milestone 5 | Milestone 6 | Milestone 7 | Milestones |
|-------------------|-------------|-------------|---------------|---------------|--------------|-------------|-------------|-------------|---|
| GE Aviation | Complete | Complete | Complete | Complete | Complete | In Work | In Work | | Milestone 7: AS13100 compliance by supply base |
| GKN Aerospace | Complete | Complete | Complete | Complete | Complete | In Work | In Work | | Milestone 6: Training plan executed to supply base |
| Honeywell | Complete | Complete | Complete | Complete | Complete | Complete | Complete | | Milestone 5: Training plan executed internally |
| Howmet | Complete | Complete | Complete | In Work | In Work | In Work | In Work | | Milestone 4b: Flow down of the Standard to the supply base. |
| IHI | Complete | Complete | Complete | Complete | In Work | In Work | Complete | | Milestone 4: Communication plan executed to supply base. |
| MTU | Complete | Complete | Complete | Complete | In Work | In Work | Complete | | Milestone 3: Communication plan executed internally. |
| PCC | In Work | In Work | In Work | Complete | Complete | Complete | In Work | | 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.) |
| Pratt and Whitney | Complete | Complete | Complete | Complete | In Work | In Work | In Work | | Milestone 1: GAP analysis being conducted. Member company committed to deployment by Dec 2022. |
| Rolls Royce | In Work | Complete | Complete | Complete | Complete | In Work | In Work | | |
| Safran | Complete | Complete | In Work | In Work | In Work | In Work | Complete | | |

December 31, 2022

■ Complete

■ In Work

■ At Risk

■ Off Plan

AESQ – Aerospace Engine Supplier Quality Strategy Group

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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














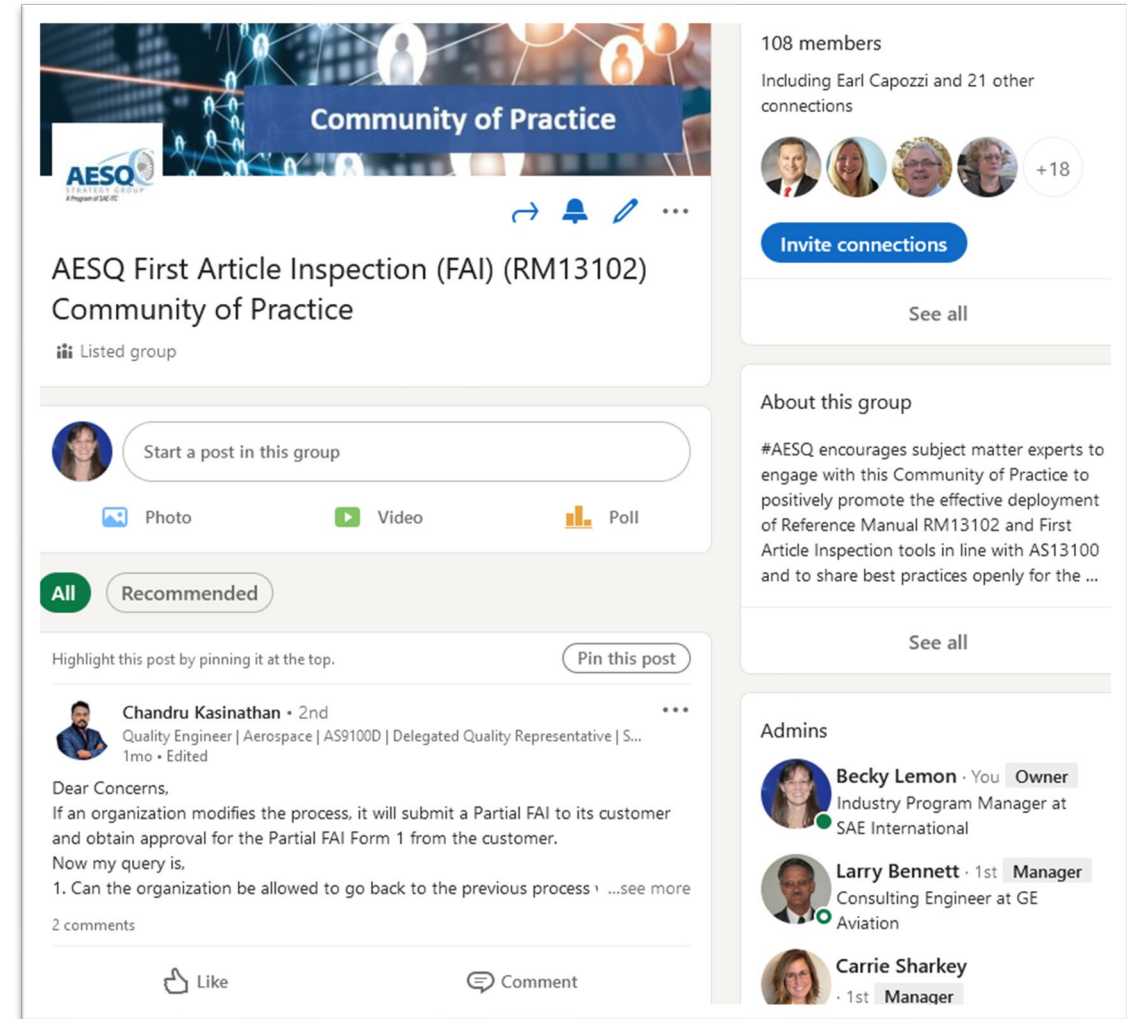
| Subject Matter Interest Group | Team Leader | Deputy Team Leader | Team Size | Charter | Regular Meetings | Activity Schedule | Web Page | Linkedin/COP Page | Events |
|--|-----------------------------------|--------------------|-----------|-------------|------------------|-------------------|-----------|-------------------|-------------|
| Problem Solving Methods (RM13000) | Marnie Ham (GE) | Completed | Completed | Completed | Completed | Completed | Completed | Completed | Completed |
| DPRV Training (AS13001) | Earl Capozzi (P&W) | Completed | Completed | Completed | In Work | Not Started | Completed | Completed | In Work |
| Process Control (incl. Inspection Frequency) (RM13002 & RM13006) | Pete Teti (P&W) | Completed | Completed | In Work | In Work | In Work | Completed | Completed | In Work |
| MSA (RM13003) | Simon Gough-Rundle (RR) | Completed | In Work | Not Started | Completed | Completed | Completed | Completed | Not Started |
| Defect Prevention Quality Tools (RM13004) | Ian Riggs (RR) | Completed | Completed | In Work | Completed | Completed | Completed | Completed | Completed |
| Quality Audit Methods (RM13005) | Tony Pailing (RR) | Not Started | Completed | Not Started | In Work | Not Started | Completed | Completed | Not Started |
| Sub-tier Management (RM13007) | Vince Miller (Howmet) | Completed | In Work | In Work | Completed | In Work | Completed | Completed | In Work |
| Design Methods (RM13008) | Lena Eckerbom Wendel (GKN) | Completed | Completed | In Work | Completed | In Work | Completed | Completed | In Work |
| Human Factors (RM13010) | Catherine Catarina-Graca (Safran) | Not Started | Completed | Completed | Completed | Completed | Completed | Completed | Completed |
| First Article Inspection (RM13102) | Carrie Sharkey (RR) | Completed | Completed | Completed | Completed | Completed | Completed | Completed | Completed |
| APQP & PPAP (RM13145) | Karl Evans (RR) | Completed | Completed | Completed | Completed | Completed | Completed | Completed | In Work |

AESQ – Aerospace Engine Supplier Quality Strategy Group

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

| | | |
|---|--|-------------|
|  | 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 |



Community of Practice

AESQ First Article Inspection (FAI) (RM13102) Community of Practice

Listed group

108 members
Including Earl Capozzi and 21 other connections

Invite connections

See all

About this group

#AESQ encourages subject matter experts to engage with this Community of Practice to positively promote the effective deployment of Reference Manual RM13102 and First Article Inspection tools in line with AS13100 and to share best practices openly for the ...

See all

Admins

- Becky Lemon** · You · Owner
Industry Program Manager at SAE International
- Larry Bennett** · 1st · Manager
Consulting Engineer at GE Aviation
- Carrie Sharkey** · 1st · Manager

Start a post in this group

Photo Video Poll

All Recommended

Highlight this post by pinning it at the top. Pin this post

Chandru Kasinathan · 2nd
Quality Engineer | Aerospace | AS9100D | Delegated Quality Representative | S...
1mo · Edited

Dear Concerns,
If an organization modifies the process, it will submit a Partial FAI to its customer and obtain approval for the Partial FAI Form 1 from the customer.
Now my query is,
1. Can the organization be allowed to go back to the previous process? ...see more

2 comments

Like Comment

AESQ UPCOMING EVENTS



[About](#) [News](#) [Documents](#) [Activities](#) [Events](#) [Membership](#) [Contact AESQ](#)



| | | | |
|------------------|--|---------|----------------|
| 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



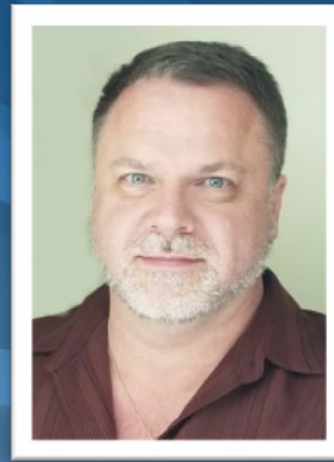
Return in 1 Minute



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

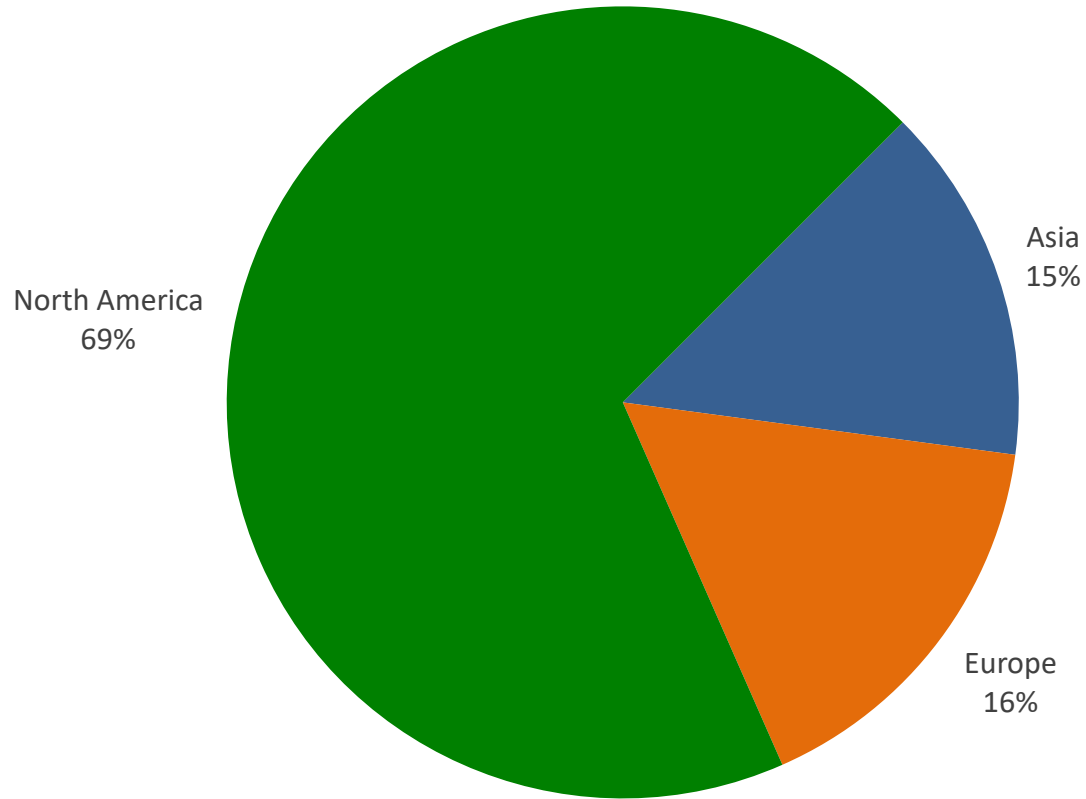
- 158 respondents
- Familiar with AESQ for existing AS13XXX documents
- Create a baseline for deployment well before the deadline
- Basic AS13100 familiarity
- Collected feedback to drive actions

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

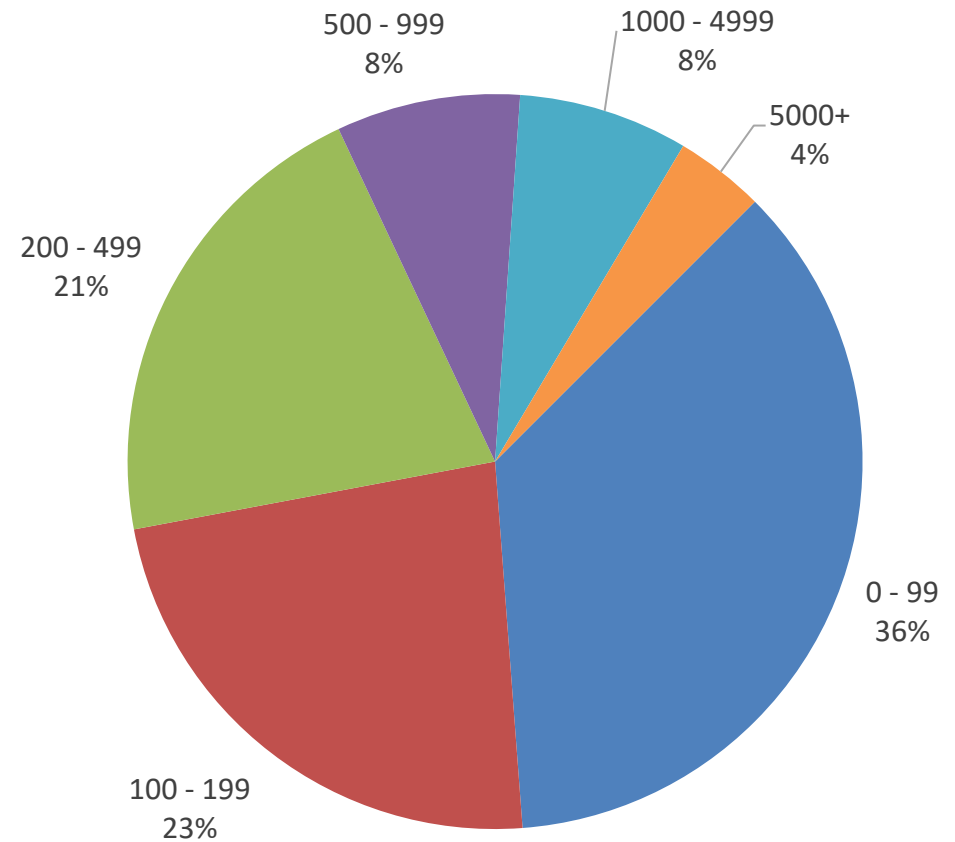
- 13 questions, both objective and open-ended
- 482 respondents to date
- 608 comments and suggestions being analyzed for actions

Respondent Demographics

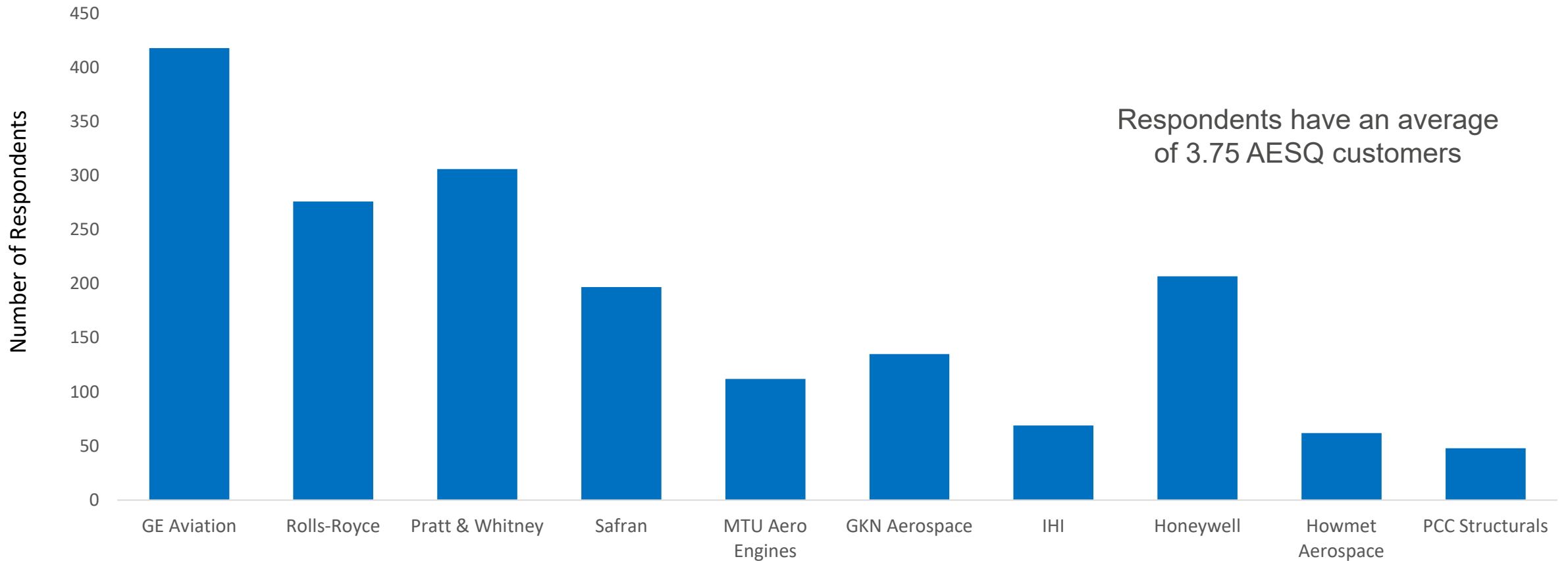
Respondent Location



Respondent Company Size



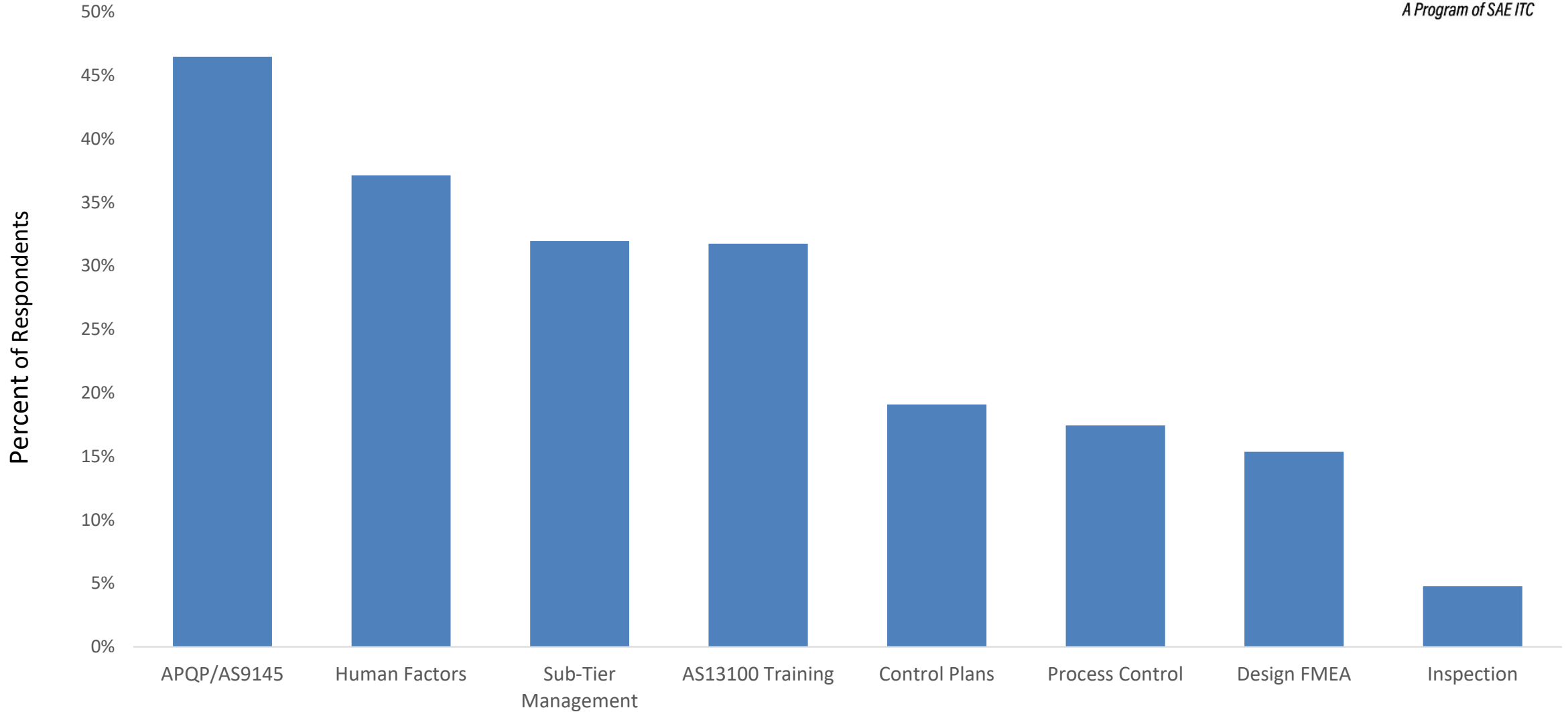
Respondents Supply to Multiple AESQ Members



Evolution of Implementation Status



Where Can We Help?



Learning Opportunities Offered by the AESQ



Recorded Past Events

| | |
|---|--|
| <p>AESQ RM13000 Problem Solving Methods Supplier Feedback Webinar presented April 20, 2022 RM13000 Problem Solving Methods Supplier Feedback Video</p> | |
| <p>AESQ First Article Inspection (FAI) RM13102 Webinar presented April 13, 2022 First Article Inspection Presentation First Article Inspection Video</p> | |
| <p>AESQ Human Factors Webinar presented January 12, 2022 Human Factors Webinar Presentation Human Factors Webinar Video</p> | |
| <p>AESQ™ Human Factors Webinar presented November 30, 2021 Human Factors Webinar Video Human Factors Webinar Presentation Human Factors Question & Answers</p> | |

Upcoming Webinars

AESQ UPCOMING EVENTS

| Category | Event Title | Format | Date |
|-----------|--|---------|----------------|
| 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 |

LinkedIn: Communities of Practice

10 COMMUNITIES OF PRACTICE (COP) LAUNCHED - 1,393 MEMBERS COLLECTIVELY

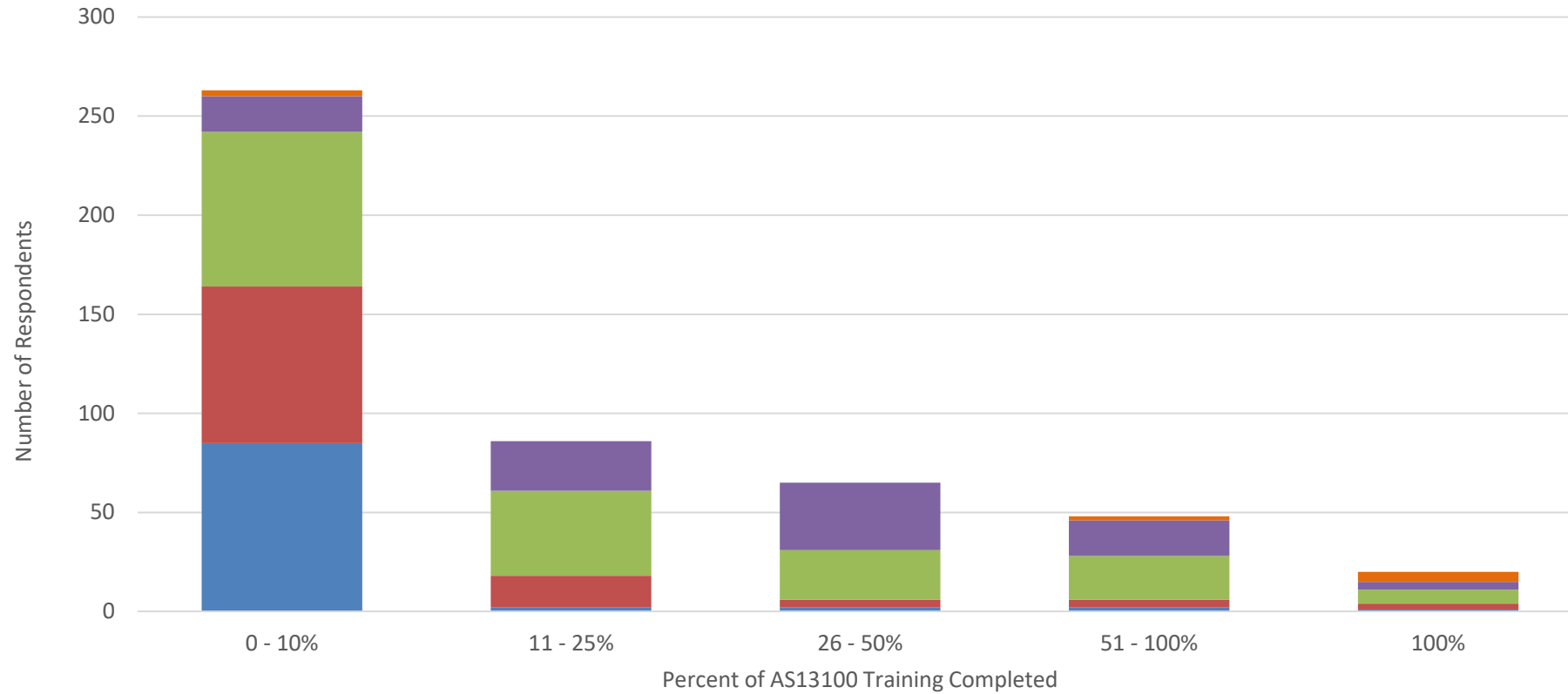
The screenshot shows a list of 10 LinkedIn Communities of Practice (COP) for AESQ, including:

- AESQ APQP & PPAP (RM1145) Community of Practice
- AESQ Quality Audit Methods (RM1305) Community of Practice
- AESQ Problem Solving Methods (RM1300) Community of Practice
- AESQ First Article Inspection (FAI) (RM13102) Community of Practice
- AESQ Sub-Tier Management (RM1307) Community of Practice
- AESQ Design Work & Production Repair/Rework (RM1308 & RM1301) Community of Practice
- AESQ Measurement Systems Analysis (MSA) (RM1303) Community of Practice
- AESQ Human Factors (RM1304) Community of Practice
- AESQ Defect Prevention Tools for APQP (RM13004) Community of Practice
- Aerospace DPRO Community of Practice

The detailed view of the 'AESQ First Article Inspection (FAI) (RM13102) Community of Practice' shows it has 108 members and includes a post from Chandu Kalathur regarding a Partial FAI process.

What You Told Us

AS13100 Implementation vs. Training Status



- The organization believes we are now compliant with AS13100
- The RM13009 gap analysis has been completed and a gap closure action plan is in place
- The compliance gap analysis of RM13009 has been initiated and is in process
- We have purchased a copy of AS13100 and are reviewing it
- Compliance activities have not yet begun

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 Compliant 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 DASIS 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 | | |
| 5.3.5.1 | Design Records Retention | | |
| 5.3.5.2 | Radiographic Film Record Retention | | |
| 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 | | |

APQP DEPLOYMENT



KARL EVANS
APQP TECHNICAL PROJECT MANAGER
ROLLS-ROYCE

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

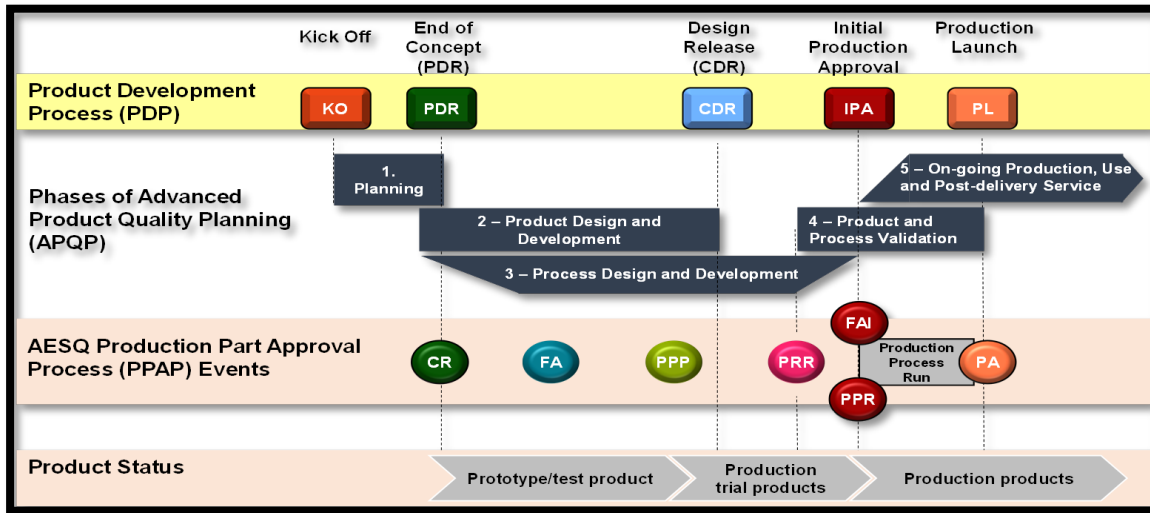


Application within Rolls-Royce of AS13100/9145 APQP and PPAP

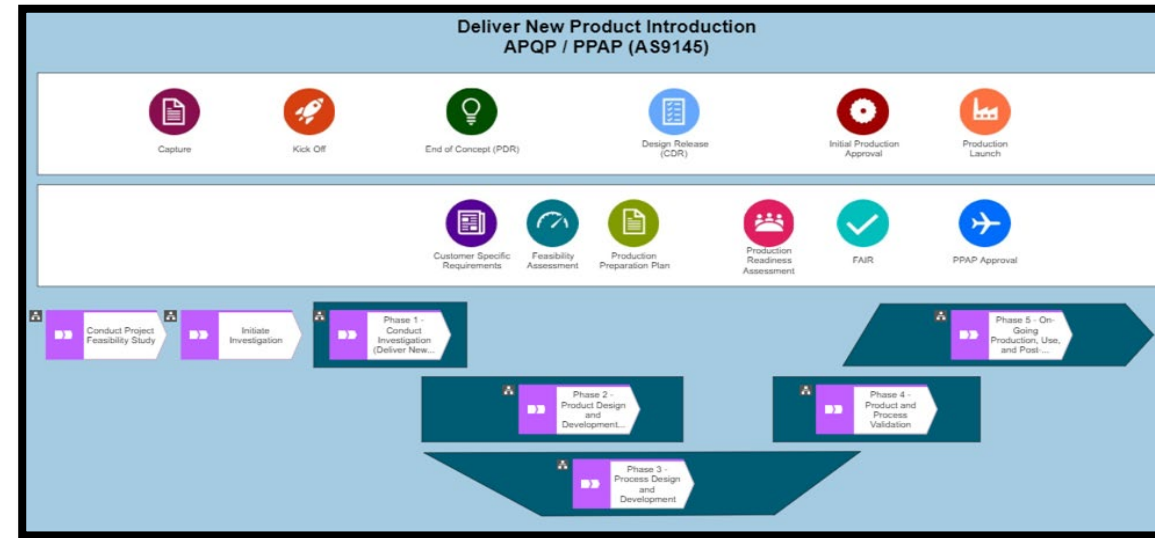


Ourselves...Rolls-Royce Civil Aerospace is fully committed to APQP, PPAP and Cross functional working.
Our Customers...they are asking for this.
Our Suppliers...AS13100 APQP and PPAP means we have significantly reduced our Customer Specific Requirements.

AS13100 APQP & PPAP Timing Chart



Rolls-Royce Management System



Our Journey to APQP



2010

2017

2021

2022

Quality Improvement drivers

Build in Quality

Zero Defects

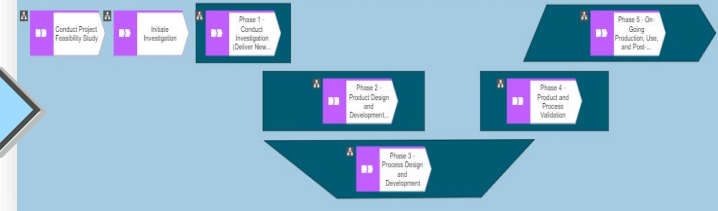
Quality Management Processes

PPAP

IPPR

APQP
Early trials

APQP and PPAP



Quality Planning Activities

Adoption of Industry Standards

SPC

CCF > KCF

PFMEA

DFMEA

KPC/CI

SABRe

#1

#2

#3

Adoption of Industry Standards

#4

- NPI Requirements
- No industry std
- RR Specifics (extensive)

- APQP & PPAP
- No industry std
- RR Specifics (lots)

- APQP & PPAP
- AS9145
- RR Specifics (fewer)

- APQP & PPAP
- AS13100/ AS9145
- RR Specifics (min.)

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

Project Planning & Management

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

Define practices for concern
management

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.

It's a Team Sport

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

Each time you start

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

People Process

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

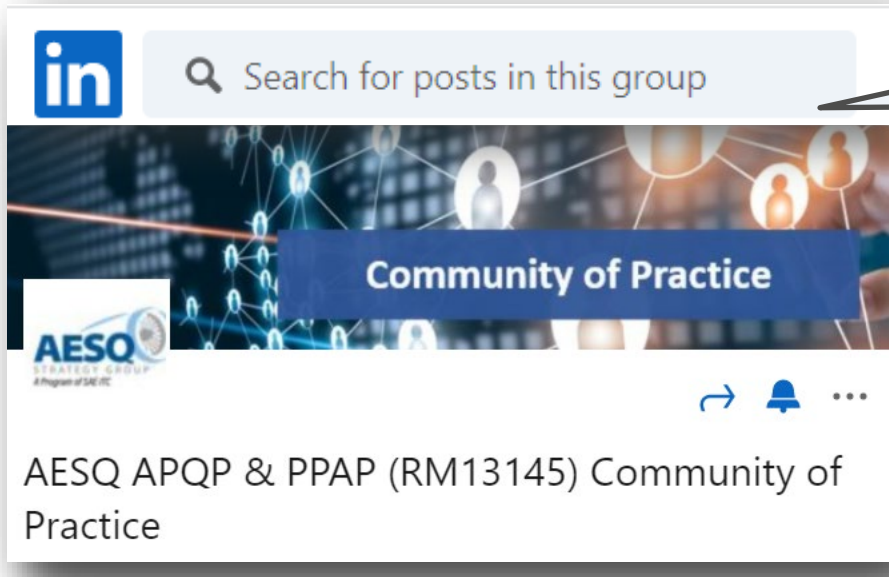
Progress with a Plan

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



Use "RM13145" it contains a volume of good practices



Raise questions, share ideas & good practices

APPROACH AND ADVANCEMENT TOWARDS AS13100

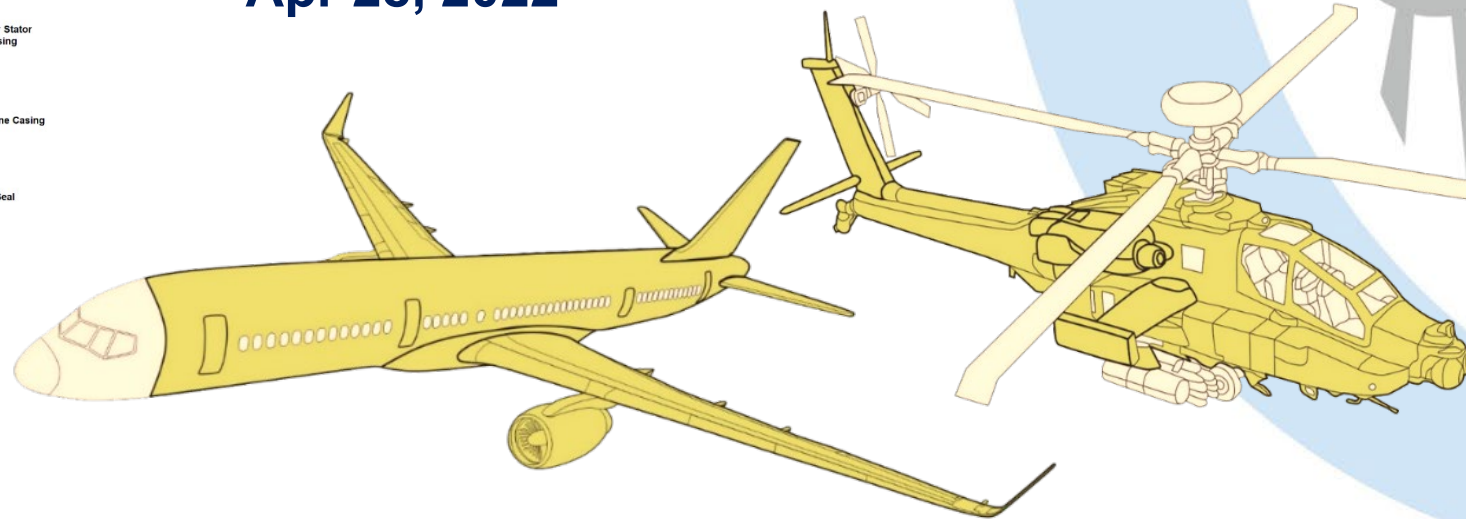
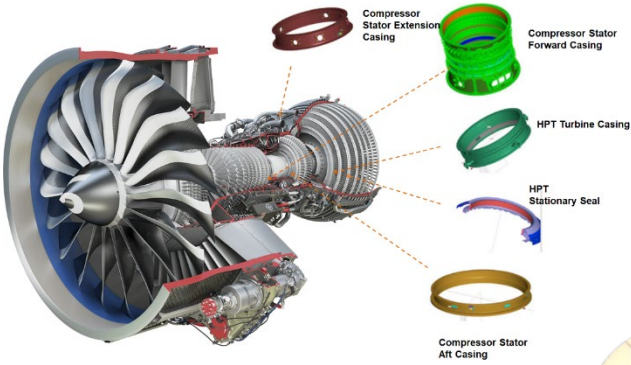


MANI RATHINAM RAJAMANI
DEPUTY MANAGER – QUALITY ENGINEERING
TATA ADVANCED SYSTEMS LIMITED



APPROACH AND ADVANCEMENT TOWARDS AS13100

Apr 28, 2022



“Propelling India Forward”

AESQ – Aero Engine Supplier Quality Strategy Group

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CONTENT

- **TASL INTRODUCTION.**
- **TASL JOURNEY WITH AESQ™ TEAM.**
- **TASL AS13100 TRANSITION & DEPLOYMENT FRAMEWORK**
- **AS13100 TASL TRANSITION MILESTONE PLAN**
- **TRANSITION COMMON QUESTIONS/CHALLENGES AND THEIR MITIGATIONS.**
- **AESQ™ AS13100 REQUIREMENTS STRUCTURE.**
- **AS13100 DEPLOYMENT - QMS STRATEGY, GAP-ANALYSIS & CALLOUTS STUDY.**
- **AS13100 vs CUSTOMER SPECIFIC REQUIREMENTS SUPPLIER UNDERSTANDING.**
- **APPROACH TO INTEGRATION OF APQP AND APQP CORE TOOLS.**
- **AS13100 DEPLOYMENT SUPPORT AT SUB-TIER SUPPLIERS.**
- **AS13100 PRACTITIONER & APQP CFT TRAININGS.**
- **TOOLS FOR EFFECTIVE IMPLEMENTATION OF AS13100.**
- **POTENTIAL BENEFITS OF IMPLEMENTING AS13100**
- **AS13100 TRANSITION BEST PRACTICES & LESSONS LEARNT**



200 mi

TATA ADVANCED SYSTEMS LIMITED (TASL)

Who are We & What We Do?

TATA
TATA ADVANCED SYSTEMS

ENGINEERING SERVICES

SPECIAL PROCESSES

TOOL DESIGN & FABRICATION

SHEET METAL FORMING

COMPOSITE STRUCTURES

METAL MACHINING

MAJOR ASSEMBLIES & AIRFRAMES

AERO-ENGINE COMPONENTS MANUFACTURING, SPECIAL PROCESS & ASSEMBLY

NAGPUR
TASL - N
Metallic & Composite COE Facility

NAGPUR

HYDERABAD

HYDERABAD
TASL and JV's (TSAL, TLMAL, TBAL)
Metallic, Assembly & Aero-engines COE Facility

BENGALURU
TASL - B

Composite COE Facility

BENGALURU

AESQ - Aero Engine Supplier Quality Strategy Group

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TASL JOURNEY WITH AESQ™ TEAM



JAN-2014

Qualify as an Aero-Engine Detail Parts Supplier.



NOV-2014 & 2015

First Aero-Engine Projects Qualification & Contract

Active Work Groups and Projects

| Item No. | Item Name | Requirement | Approval Status | Approval Date | Requester | Status |
|----------|-----------|-----------------------------------|-----------------|---------------|-----------|-----------|
| 1 | AS13005 | Internal Audit Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 2 | AS13006 | Process Control Methods | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 3 | AS13007 | Supplier Management | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 4 | AS13008 | Supplier Performance Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |

Deputy Manager
marjamani@tasl.aero

Tata Advanced Systems Ltd
Liaison

OCT,2017

Apply and Join G-22 Aero-Engine Supplier Quality (AESQ™) as a Liaison Member.

| Item No. | Item Name | Requirement | Approval Status | Approval Date | Requester | Status |
|----------|-----------|-------------------------------------|-----------------|---------------|-----------|-----------|
| 1 | AS13005 | Internal Audit Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 2 | AS13006 | Process Control Methods | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 3 | AS13007 | Supplier Management | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 4 | AS13008 | Supplier Performance Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 5 | AS13009 | Supplier Financial Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 6 | AS13010 | Supplier Environmental Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |
| 7 | AS13011 | Supplier Social Requirements | Approved | 2015-11-10 | MARJAMANI | COMPLETED |

MAY,2018

Participation in Aero-Engine AS13006 Standard Feedback Review

G-22 Aerospace Engine Supplier Quality (AESQ) Committee

- AS13005 - Documents Post December 2020 Rater
- AS13006 - Documents Post December 2020 Rater
- AS13007 - Documents Post December 2020 Rater
- AS13008 - Documents Post December 2020 Rater
- AS13009 - Documents Post December 2020 Rater
- AS13010 - Documents Post December 2020 Rater
- AS13011 - Documents Post December 2020 Rater

JUL & DEC,2020

Participation in Aero-Engine AS13100 Standard and Reference Manual Review and Feedback

APR,2021

Transition to AS13100 Standard and Reference Manual requirements by Dec, 2022.

AESQ – Aero Engine Supplier Quality Strategy Group

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TASL AS13100 TRANSITION & DEPLOYMENT FRAMEWORK



**CY 2023:
IMPROVE & SUSTAIN**

IMPROVEMENT

- CONTINUALLY STRIVE FOR IMPROVEMENT OF PROCESS, PEOPLE, PERFORMANCE TO ACHIEVE ZERO DEFECTS.

**CY 2021:
PLANNING**

PLANNING

- IDENTIFY, COLLECT, COLLATE, STUDY AND RECOGNIZE REQUIREMENTS AND UTILIZE GUIDANCE MATERIALS FOR DEPLOYMENT.

**CY 2022 Q3 & Q4:
REVIEW & EFFICACY**

REVIEW

- MONITOR AND REPORT EFFECTIVENESS OF IMPLEMENTATION WITH ACTIONS FOR IMPROVEMENT.

**CY 2022 Q1 & Q2:
EDUCATE & EXECUTE**

EXECUTION

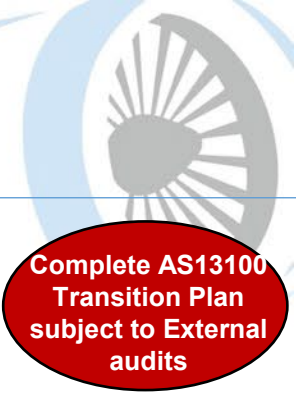
- DEVELOP AND DEPLOY PROCEDURES, PROCESS FLOWS, TRAINING, SOFTWARES AND TOOLS.

AESQ - Aero Engine Supplier Quality Strategy Group

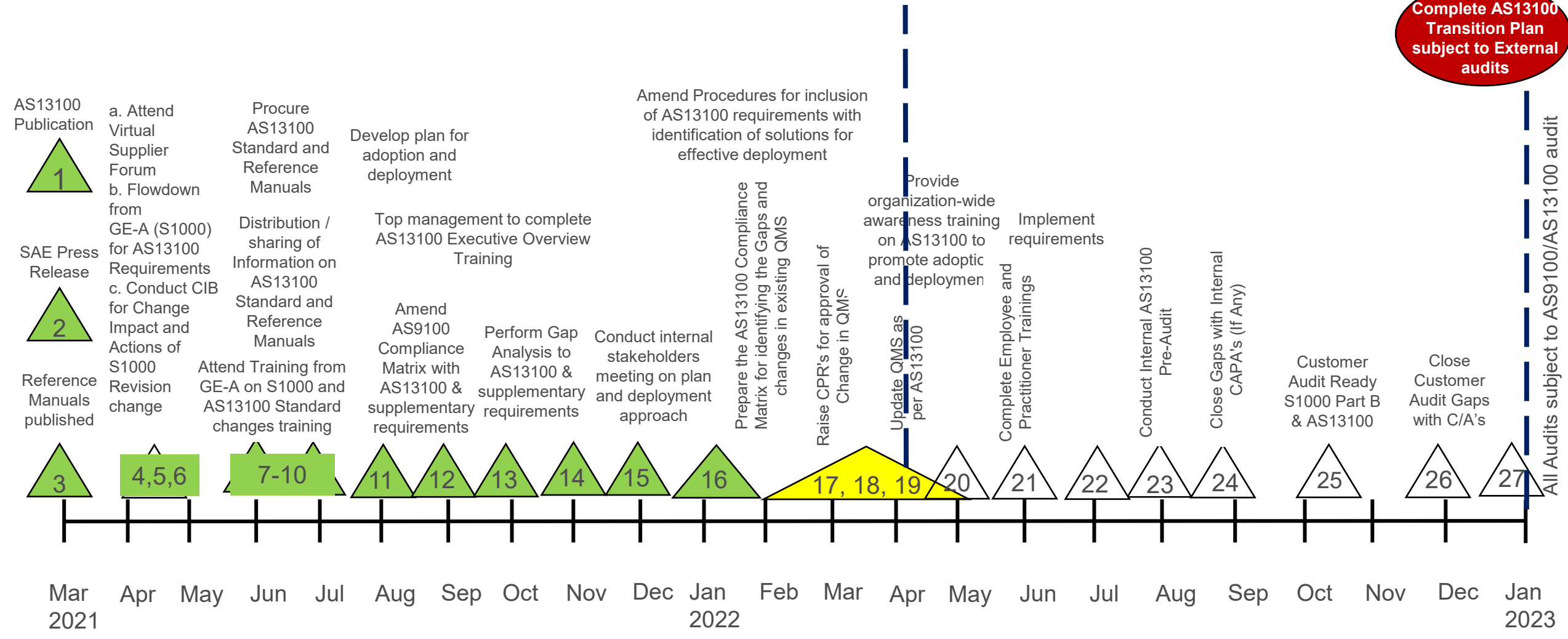
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AS13100 TASL TRANSITION MILESTONE PLAN

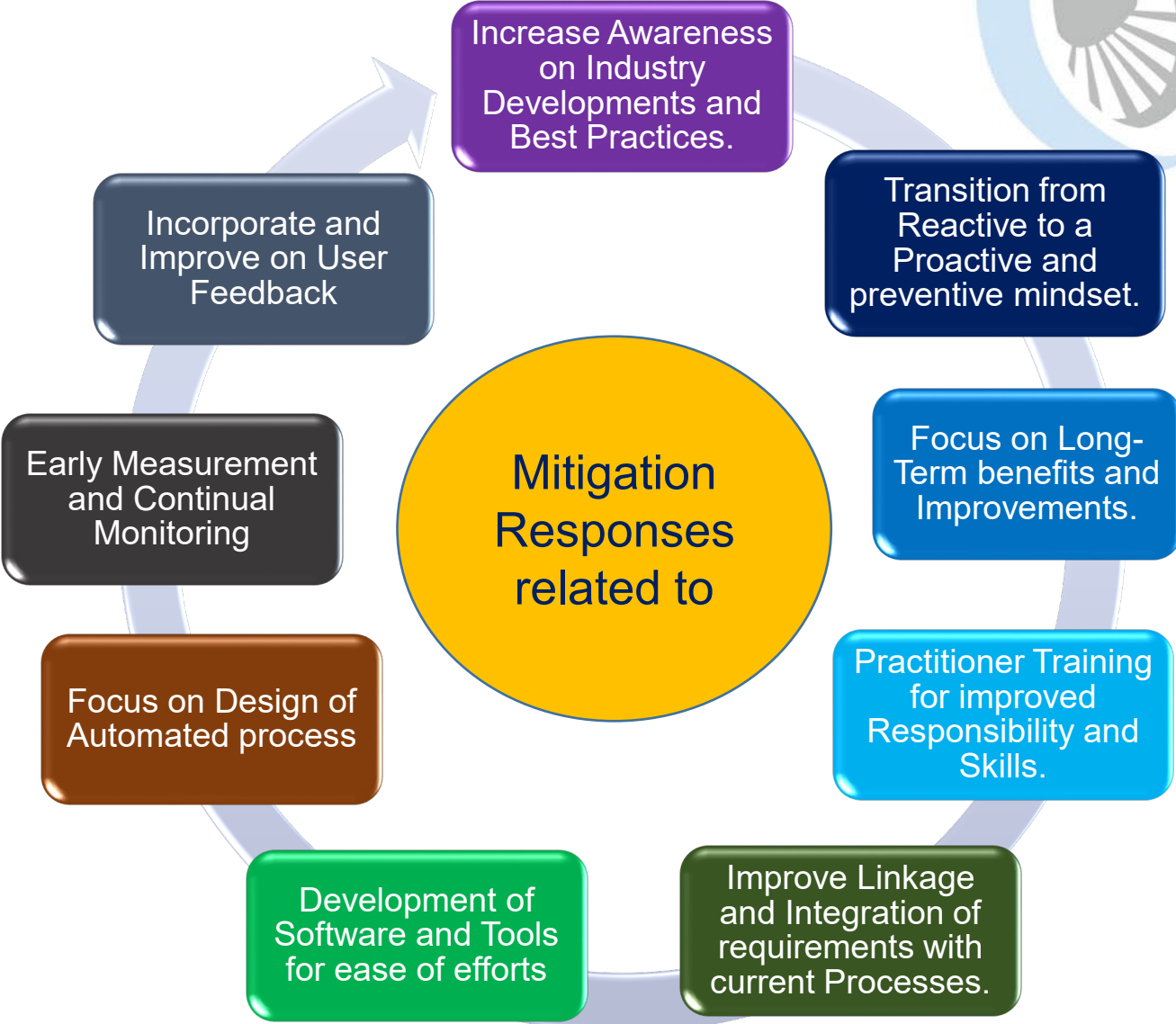
TASL to achieve Key milestones compliance to AS13100 requirements by 12/31/2022



Complete AS13100 Transition Plan subject to External audits



COMMON QUESTIONS/CHALLENGES AND THEIR MITIGATIONS



AESQ™ AS13100 REQUIREMENTS STRUCTURE

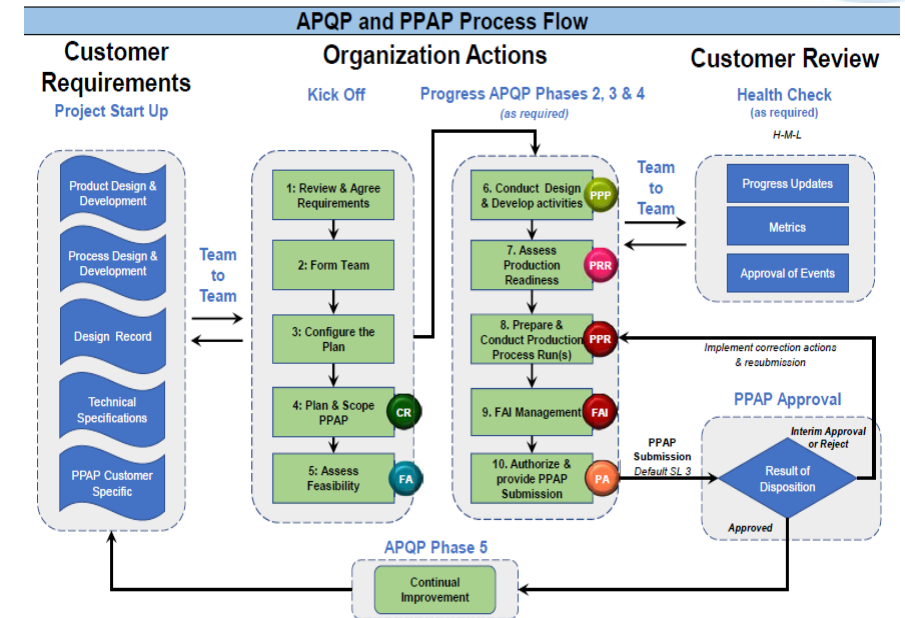
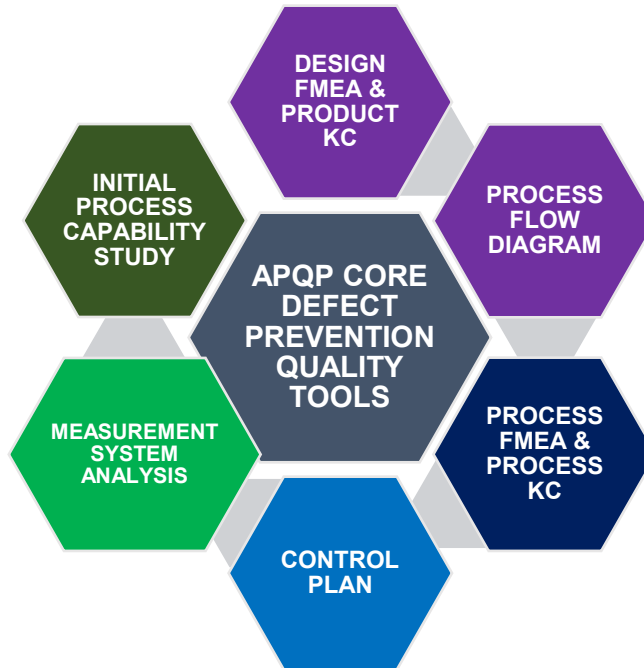
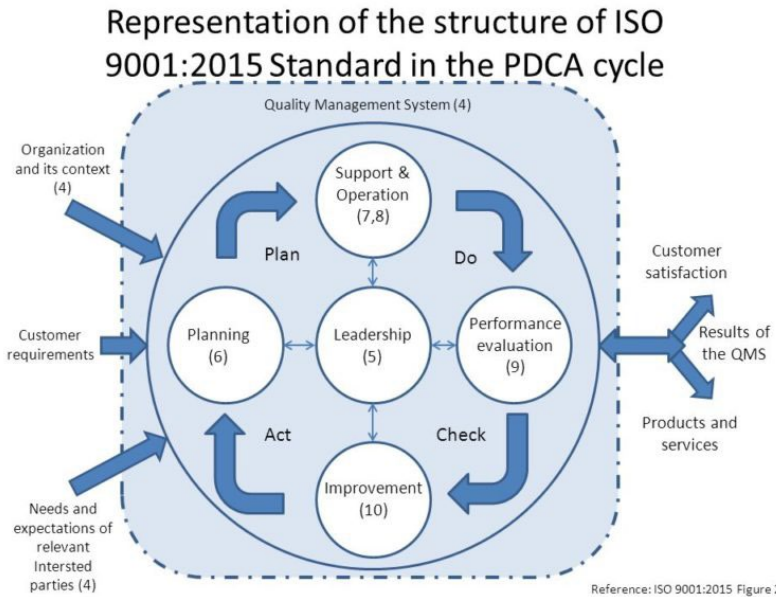
Chapter A
9100 QMS



Chapter C
CORE DEFECT PREVENTION TOOLS



Chapter B
9145 APQP/PPAP



9100 SUPPLEMENTAL REQUIREMENTS TRANSITION OF AS1300x STANDARDS

DEPLOYMENT OF APQP METHODOLOGY



13 REFERENCE MANUALS

GUIDANCE FOR REQUIREMENTS DEPLOYMENT

INTEGRATED CHAPTER A, B AND C WITH NEW PRODUCT INDUSTRIALIZATION

AS13100 QMS DEPLOYMENT STRATEGY (QMS VS STANDARD VS CUSTOMER REQUIREMENTS STUDY)

SABRe
Supplier Management System Requirements

Civil and Defence Aerospace
Revision 1.0
July 2021

United Technologies
AEROSPACE SUPPLIER QUALITY REQUIREMENTS
Number: ASQR-01
Revision: 11
Effective Date: 08/12/2018
Page 1 of 17

Supplier Quality System Requirements

INTRODUCTION

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GE Aviation
Aviation Quality Specification

AEROSPACE QUALITY SYSTEM REQUIREMENTS FOR SUPPLIERS
Specification Number: S-SPEC-1
aeQMS #: S-1000
Issue Date: Apr 1, 2021

Core Document – Part A

Table of Content

Paragraph Title

1.0 INTRODUCTION

2.0 SCOPE

3.0 REFERENCES

4.0 DEFINITIONS

5.0 REQUIREMENTS

6.0 MANAGEMENT SYSTEMS

7.0 PRODUCT REALIZATION

8.0 MEASUREMENT, ANALYSIS, AND IMPROVEMENT

9.0 LEGAL COMPLIANCE

10.0 RECORDS MANAGEMENT

11.0 TRAINING

12.0 SUPPLIER MANAGEMENT

13.0 RISK MANAGEMENT

14.0 INFORMATION SECURITY

15.0 ENVIRONMENTAL, HEALTH, AND SAFETY

16.0 SOCIAL RESPONSIBILITY

17.0 OTHER REQUIREMENTS

Customer Flowdown Documents

Perform Gap Analysis (RM13009) for

| Applicable Sites | OEM Programs of |
|------------------|------------------|
| TASL Hyderabad | GE-A |
| TSAL Hyderabad | GE-A & RR |
| TASL Bangalore | GE-A, RR and P&W |
| TASL Nagpur | RR |

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SE INTERNATIONAL
AEROSPACE STANDARD
AS13100™
Issued 2021-03

RATIONALE

This standard has been created by the SAE G-22 Aerospace Engine Supplier Quality (AESQ) Technical Committee to harmonize and simplify supplier quality requirements that are in addition to the requirements of ASQ Quality Management System (QMS) Requirements for Aerospace, Quality and Customer Organizations and ASQ Advanced Product Quality Planning (APQP) Requirements for Aerospace.

Previously the Aerospace Engine Manufacturers based their supplier quality requirements on 9100 but had differing supplemental requirements and guidance across with largely the same intent. These supplemental requirements originate from the need to meet Regulatory, Customer, Industry, and Aerospace requirements that are not explicitly covered in 9100 and 9142.

This standard sets out to one understanding, efficiency, as customers, the primary intent processes, clarity, consistent. These common supplements therefore distinct guidance.

To ensure customer satisfied improve safe, reliable product. The production of this standard is the objective of providing a common set of requirements for the delivery of product to meet the customer's needs.

The ASQ G-22 Aerospace Quality Council is developing, safety, principles defined within this.

The AESQ strategy is to provide Advanced Product Quality Planning and Process Control to enable the supply chain to achieve Zero Defects.

AESQ

RM13000
8D Problem Solving Method

AESQ

RM13004
Defect Prevention Quality Tools to Support APQP & PPAP

AESQ

RM13008
Design Work

AESQ

M13145
Just Quality Planning Production Part Approval (J) within Aerospace

AESQ Reference Manual
Supporting SAE AS13100™ Standard

AESQ Reference Manual
Supporting SAE AS13100™ Standard

AESQ Reference Manual
Supporting SAE AS13100™ Standard

Standard and 13 Reference Manual Requirements

TASL's PROCESS CLASSIFICATION FRAMEWORK (PCF)

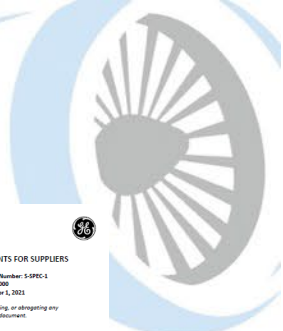


Update QMS Documentation for Customer Specific and Standard requirements.

- **QM** – No Update
- **AEOM** – Create
- **QAP** - Update
- **SOP** – Update
- **POI** – Create
- **Software** - Update
- **Templates** - Create

- CPD Corporate Policy Directive
- QM Quality Manual
- OM Operating Manual
- SOP Standard Operating Procedure
- OI Operating Instruction
- POI Project Operating Instruction
- QAP Quality Assurance Plan
- All Forms, Flowcharts, Annexes, etc.

AS13100 GAP-ANALYSIS APPROACH USING RM13009



Revision Date : 16-04-2022

AS13100 Compliance Plan

| Clause | Clause title | Organization's Process Reference (or comment) | Action | Owner | Completion Due Date | % Completion | Date Closed | Status (Auto Field) |
|--------|--------------|---|--------|-------|---------------------|--------------|-------------|---------------------|
| | | | | | | | | |

AS13100 STANDARD AND REFERENCE MANUALS REQUIREMENTS STUDY AND REVIEW

| S.No | Chapter | Clause Number | Clause Name | Shall | Should | May | Can | Call | Note |
|-------|---------------------|---------------|---|-------|--------|-----|-----|------|------|
| 1 | INTRODUCTION | 1 | APPLICABLE DOCUMENTS | 0 | 1 | 1 | 3 | 0 | 0 |
| 2 | INTRODUCTION | 2 | APPLICABLE DOCUMENTS | 2 | 0 | 2 | 0 | 0 | 2 |
| 3 | AS13100 - Chapter A | 3 | TERMS AND DEFINITIONS | 5 | 1 | 4 | 18 | 0 | 18 |
| 4 | AS13100 - Chapter A | 4 | CONTEXT OF ORGANIZATION | 15 | 1 | 0 | 2 | 2 | 1 |
| 5 | AS13100 - Chapter A | 5 | LEADERSHIP | 5 | 0 | 0 | 0 | 1 | 0 |
| 6 | AS13100 - Chapter A | 6 | PLANNING | 2 | 0 | 1 | 0 | 0 | 0 |
| 7 | AS13100 - Chapter A | 7 | SUPPORT | 44 | 4 | 5 | 3 | 9 | 6 |
| 8 | AS13100 - Chapter A | 8.1 | Operational Planning and Control | 3 | 0 | 0 | 1 | 0 | 0 |
| 9 | AS13100 - Chapter A | 8.2 | Requirements for Products and Services | 8 | 0 | 0 | 0 | 0 | 0 |
| 10 | AS13100 - Chapter A | 8.3 | Design and Development of Products and Services | 39 | 0 | 0 | 2 | 6 | 1 |
| 11 | AS13100 - Chapter A | 8.4 | Control of Externally Provided Processes, Products, and Services | 30 | 1 | 1 | 3 | 3 | 3 |
| 12 | AS13100 - Chapter A | 8.5 | Production and Service Provision | 21 | 0 | 6 | 2 | 2 | 1 |
| 13 | AS13100 - Chapter A | 8.6 | Release of Products and Services | 4 | 0 | 0 | 0 | 0 | 0 |
| 14 | AS13100 - Chapter A | 8.7 | Control of Nonconforming Outputs | 3 | 1 | 0 | 0 | 1 | 0 |
| 15 | AS13100 - Chapter A | 9 | PERFORMANCE EVALUATION | 39 | 2 | 5 | 4 | 8 | 8 |
| 16 | AS13100 - Chapter A | 10 | IMPROVEMENT | 17 | 1 | 1 | 1 | 9 | 2 |
| 17 | AS13100 - Chapter B | 11-19 | 9145 - APQP and PPAP - AESQ's Supplemental Requirements | 14 | 1 | 7 | 7 | 25 | 16 |
| 18 | AS13100 - Chapter C | 20-21 | Core Defect Prevention Quality Tools to Support APQP and PPAP - Supplemental Requirements | 62 | 14 | 13 | 10 | 15 | 15 |
| 19 | APPENDIX A | APPENDIX A | STANDARD RELATIONSHIPS | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | APPENDIX B | APPENDIX B | AS13100 REQUIREMENTS APPLICABILITY MATRIX - ORGANIZATION TYPES AND FLOWCHARTS DEFINING TO WHOM THEY APPLY | 1 | 0 | 0 | 2 | 0 | 1 |
| TOTAL | | | | 314 | 27 | 46 | 57 | 81 | 67 |

Study Customer Flowdown Documents

Compare customer requirements from SABRe and GE documents to identify superseding requirements.

For Applicable Clauses, brainstorm with process owners on incorporation steps of

- Standard and Customer requirements.
- suggested RM Guidance process.
- Process flow and Steps.
- Implementation Timeline.
- Change Requests.
- Procedure Updates.
- Trainings.
- Tools and Software.
- Audit reporting and results review.

For Not Applicable Clauses Record Rationale in Documented Information

| S.No | RM Number | RM Name | RR SABRE4 | | | GE S1000 & S1002 | | | AS13100 | | |
|--------------------|-----------|-----------------------|---|--------------------|----------|------------------|--------------------|----------------------|---------|--------------------|----------------------|
| | | | Clause | Clause Requirement | Call out | Clause | Clause Requirement | Requirement Call out | Clause | Clause Requirement | Requirement Call out |
| 1 | RM 13009 | Compliance Assessment | | | | | | | | | Shall |
| Clause Requirement | | | <p>The organization shall conduct an A assessment to ensure that the scope includes the full scope of this standard recommendations on how to complete assessment</p> | | | | | | | | |
| | | | <p>2. AEOM should also call-out the AS13100 self-assessment as detailed in RM13009</p> | | | | | | | | |

Compare Customer and Standard documents for Superseding requirements

Action Plan for Implementation of superseding requirement

AS13100 CHAPTER A (QMS) CALLOUTS



Shall
(237)

Should
(12)

Can
(38)

May
(26)

Audit
(6)

Upon Request
(4)

Note
(35)

Documented Process
(7)

Responsible & Practitioner
(10)

Documented Procedure
(0)

Documented Information
(30)

Customer Approval
(21)

Assessment
(8)

See
(41)

Evidence
(7)

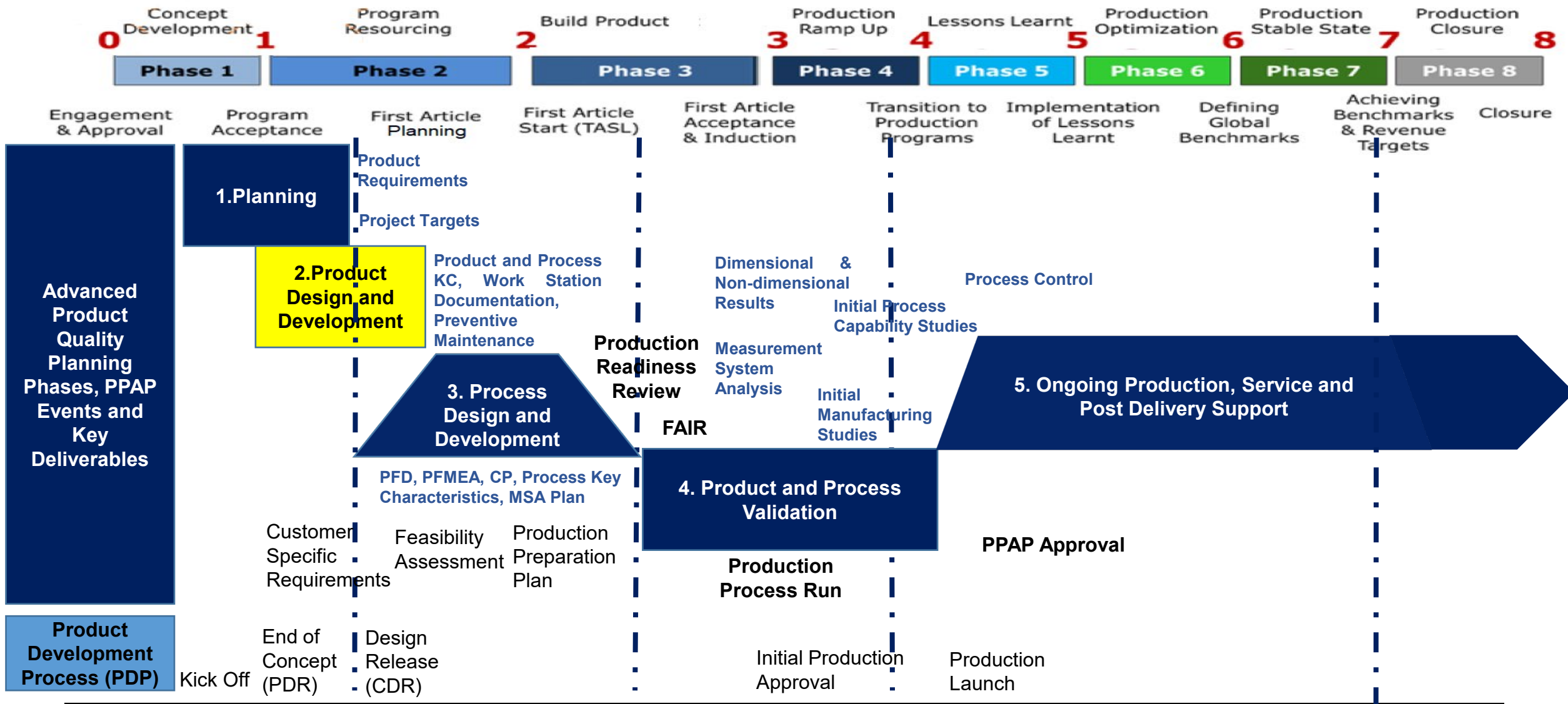
Similar analysis done for AS13100 Chapters B, C and Customer Specific Flowdown documents

SUPERSEDING REQUIREMENTS UNDERSTANDING METHODOLOGY

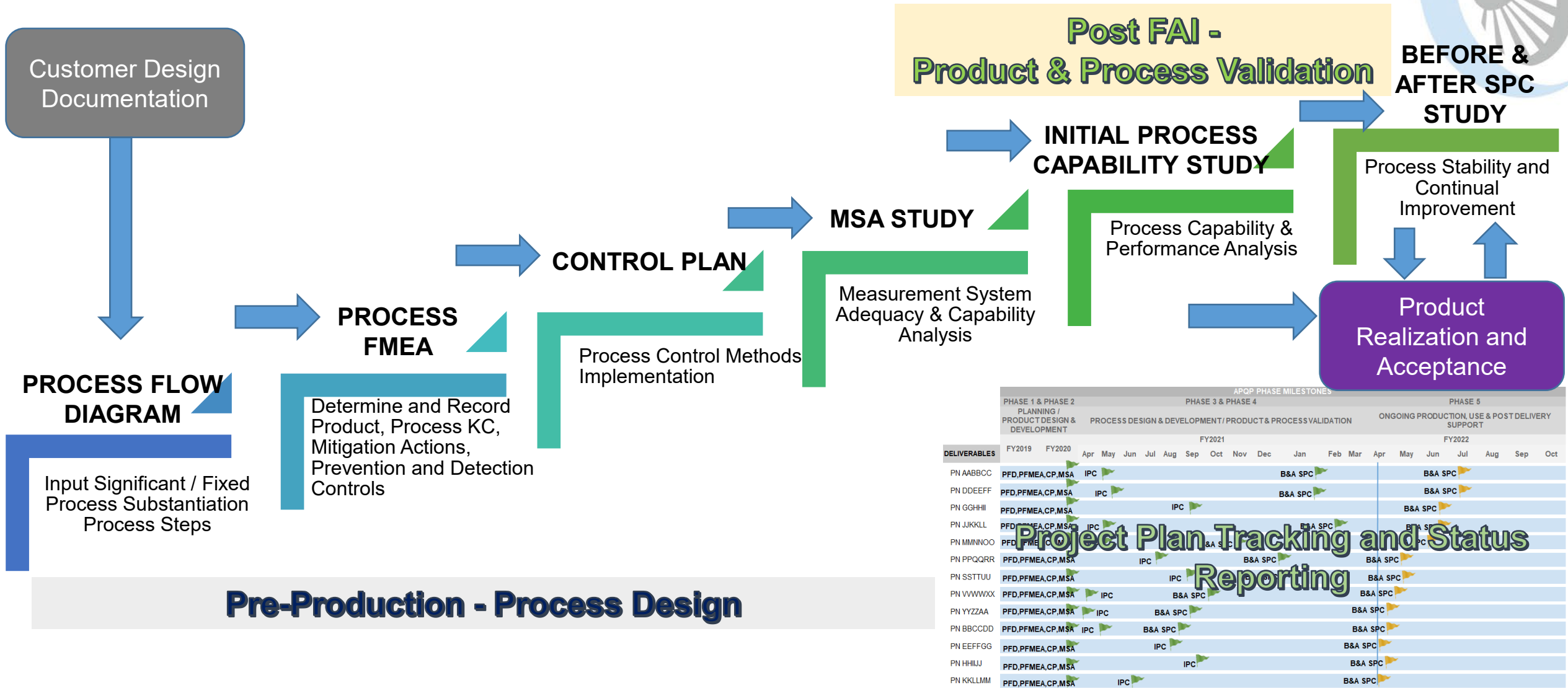


| | Customer Documents (S1000, SABRe4, ASQR01,etc.) | AS13100 Standard | Understanding | Recommended Actions |
|--------------------------|---|--------------------|---|--|
| Call-out Type | Shall | Shall | Shall Requirement | Incorporate requirements in existing QMS Process. |
| | Shall | Should, May, Can | Shall Requirement | Customer and Applicable statutory, regulatory requirements supersedes, hence incorporate requirements in existing QMS Process. |
| | Should, May, Can | Shall | Supplier should discuss and follow Voice of Customer (VOC) for implementation | Mutually agree on Applicability for incorporation or exclusion. |
| | Should, May, Can | Should, May, Can | Supplier should discuss and follow Voice of Customer (VOC) for implementation | Mutually agree on Applicability for incorporation or exclusion. |
| | No Flowdown | Shall Requirements | Supplier shall follow AS13100 Standard | Incorporate requirements in existing QMS Process. |
| | Shall Requirements | No Flowdown | Supplier shall follow Customer Flowdown document | Customer and Applicable statutory, regulatory requirements supersedes, hence incorporate requirements in existing QMS Process. |
| | Should, May, Can | No Flowdown | Supplier should follow Customer Flowdown document | Mutually agree on Applicability for incorporation or exclusion. |
| | No Flowdown | Should, May, Can | Supplier should discuss and follow Voice of Customer (VOC) for implementation | Mutually agree on Applicability for incorporation or exclusion. |
| | NOTE | No Flowdown | Supplier shall follow Customer Flowdown document | Customer and Applicable statutory, regulatory requirements supersedes, hence incorporate requirements in existing QMS Process. |
| | No Flowdown | NOTE | Supplier shall follow AS13100 Standard | Incorporate requirements in existing QMS Process. |
| | NOTE | NOTE | Supplier should discuss and follow Voice of Customer (VOC) for implementation | Mutually agree on Applicability for incorporation or exclusion. |
| | See RM13--- Documents | See RM13--- | Review the associated statement for determining the applicability | Review the associated statement for determining the applicability. |

APPROACH ON INTEGRATION OF APQP AND PROGRAM GATES



APPROACH ON INTEGRATION OF APQP CORE TOOLS



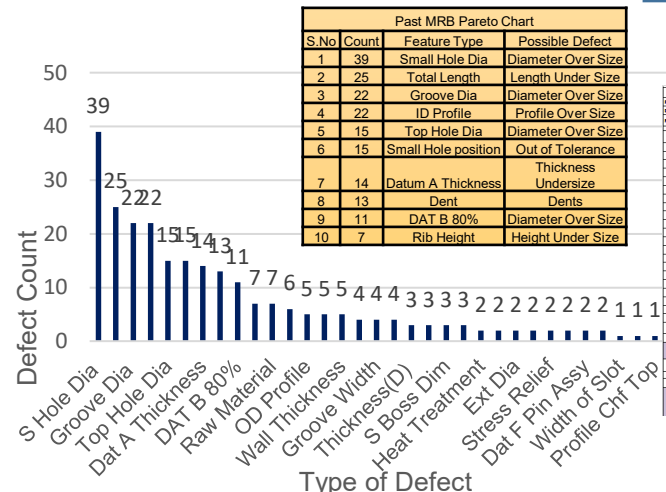
PROCESS FMEA AS PROACTIVE RISK ANALYSIS TOOL



| Rev | Rev Description | Rev Date | Rev By | Rev Appr |
|-----|-----------------|------------|----------|----------|
| 1 | Initial Release | 2010-01-01 | J. Smith | M. Jones |
| 2 | Design Change | 2010-03-15 | J. Smith | M. Jones |
| 3 | Material Change | 2010-05-20 | J. Smith | M. Jones |
| 4 | Process Change | 2010-07-10 | J. Smith | M. Jones |
| 5 | Final Release | 2010-09-01 | J. Smith | M. Jones |

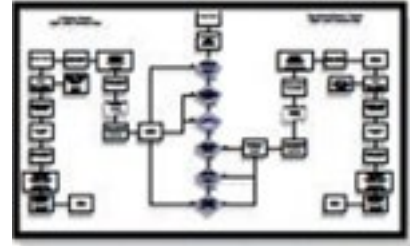
DFMEA

Customer Inputs: Severity, Design Failure Modes and Product KC's



Past MRB's Inputs from Customer

Material Release to Shipment of Conforming product



Process Flow

Process Steps, Product KCs & CIs

| Rev | Rev Description | Rev Date | Rev By | Rev Appr |
|-----|-----------------|------------|----------|----------|
| 1 | Initial Release | 2010-01-01 | J. Smith | M. Jones |
| 2 | Design Change | 2010-03-15 | J. Smith | M. Jones |
| 3 | Material Change | 2010-05-20 | J. Smith | M. Jones |
| 4 | Process Change | 2010-07-10 | J. Smith | M. Jones |
| 5 | Final Release | 2010-09-01 | J. Smith | M. Jones |

GD&T SHEET
CPD's and Product KC's (Critical, Major and CPD)

Process Risk Analysis (PRA)

Part PFMEA

| Rev | Rev Description | Rev Date | Rev By | Rev Appr |
|-----|-----------------|------------|----------|----------|
| 1 | Initial Release | 2010-01-01 | J. Smith | M. Jones |
| 2 | Design Change | 2010-03-15 | J. Smith | M. Jones |
| 3 | Material Change | 2010-05-20 | J. Smith | M. Jones |
| 4 | Process Change | 2010-07-10 | J. Smith | M. Jones |
| 5 | Final Release | 2010-09-01 | J. Smith | M. Jones |

Standardized Best practice

| Rev | Rev Description | Rev Date | Rev By | Rev Appr |
|-----|-----------------|------------|----------|----------|
| 1 | Initial Release | 2010-01-01 | J. Smith | M. Jones |
| 2 | Design Change | 2010-03-15 | J. Smith | M. Jones |
| 3 | Material Change | 2010-05-20 | J. Smith | M. Jones |
| 4 | Process Change | 2010-07-10 | J. Smith | M. Jones |
| 5 | Final Release | 2010-09-01 | J. Smith | M. Jones |

PFMEA Output

RPN – As per RM13004

Process KCs & Product KCs, CIs that require monitoring

Baseline / Reference Process PFMEA

- PFMEA Action Plan with Resp. and Estimated Date of Completion and Revised RPN Number.
- Explore New Processes for Defect Prevention and Detection Controls

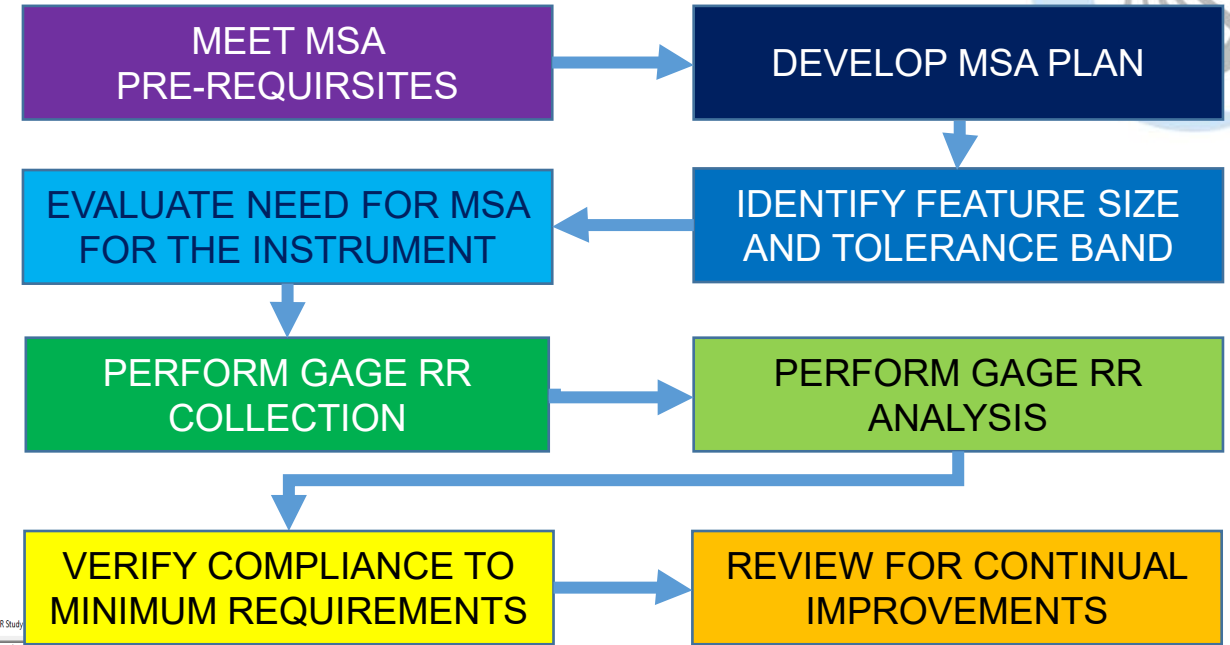
| Rev | Rev Description | Rev Date | Rev By | Rev Appr |
|-----|-----------------|------------|----------|----------|
| 1 | Initial Release | 2010-01-01 | J. Smith | M. Jones |
| 2 | Design Change | 2010-03-15 | J. Smith | M. Jones |
| 3 | Material Change | 2010-05-20 | J. Smith | M. Jones |
| 4 | Process Change | 2010-07-10 | J. Smith | M. Jones |
| 5 | Final Release | 2010-09-01 | J. Smith | M. Jones |

Control Plan

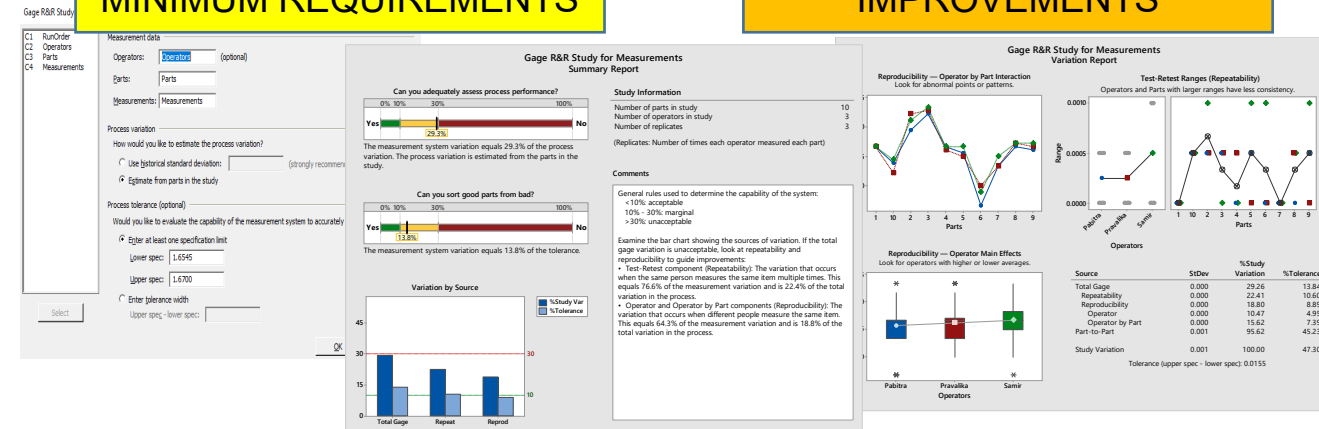
Functional Owner : Manufacturing Engineering
Functional Team Members : Customer Representatives (Design, MAE, PQE, Sourcing), Quality, Production, Supply Chain.

MSA STUDY FOR MEASUREMENT CAPABILITY CONTROL

- Template Development for MSA Plan and Gage RR
- Mutually Agreed Selection of Characteristics for MSA Study like
 - Product-Process KC's, Critical and Major Characteristics.
 - Characteristics with Past MRB and Tighter Tolerances.
- Selection of Instruments based on Feature Size, Tolerance, Feature Type and measurement system capability.
- MSA commonly Applied when
 - New measurement instruments used,
 - Change in Design tolerances implemented,
 - External Turnbacks/escapes occur, etc.
- Analyze Failure modes of Inspection process.
- Determine Need for Type 1 Gage study, when applicable.
- Collect Data from production parts for Gage RR analysis and Review for Improvements.



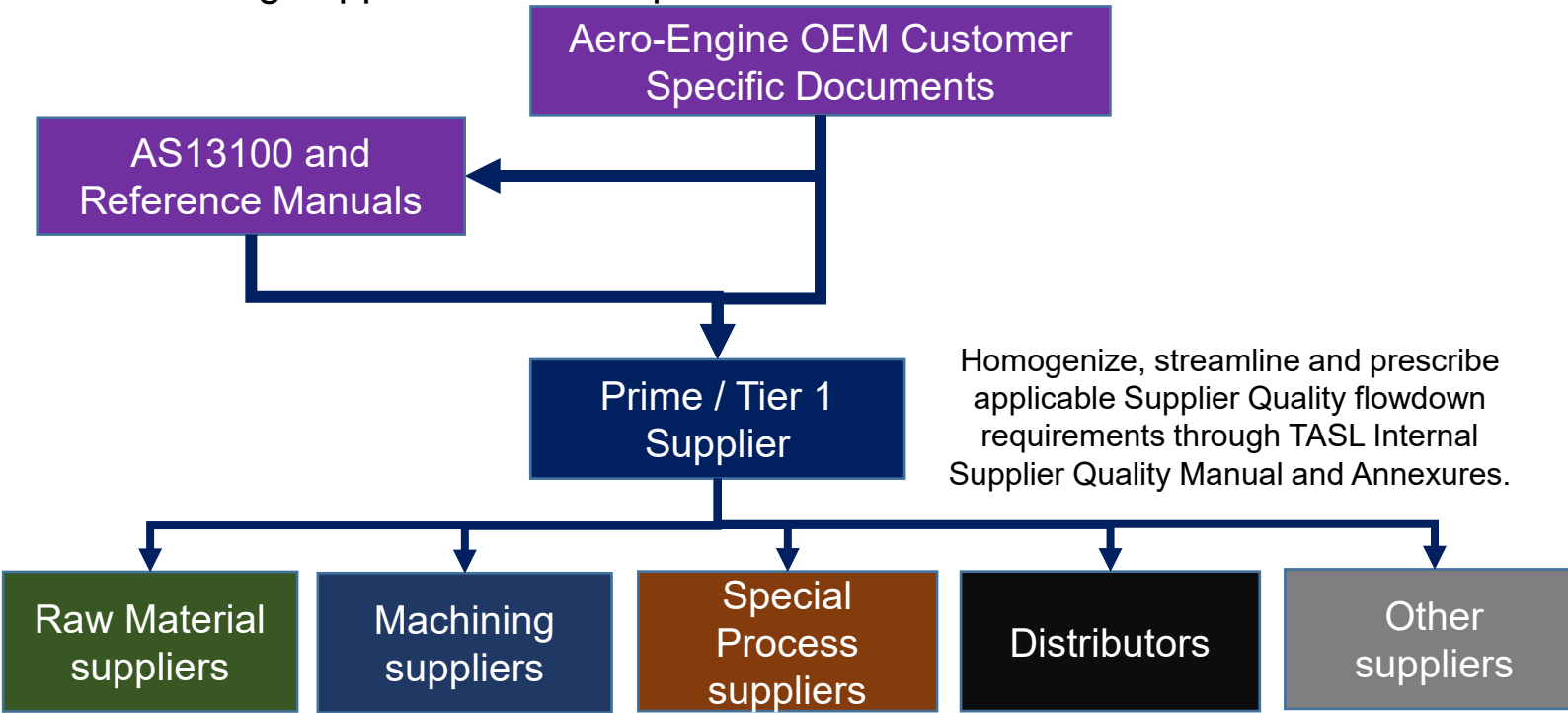
| Measurement system variation | Status |
|------------------------------|--------------|
| <10% | ACCEPTABLE |
| 10% - 30% | MARGINAL |
| >30% | UNACCEPTABLE |



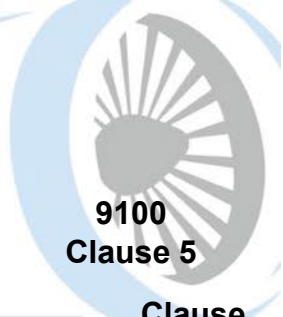
AS13100 DEPLOYMENT SUPPORT AT SUB-TIER SUPPLIERS

Supporting Activities :

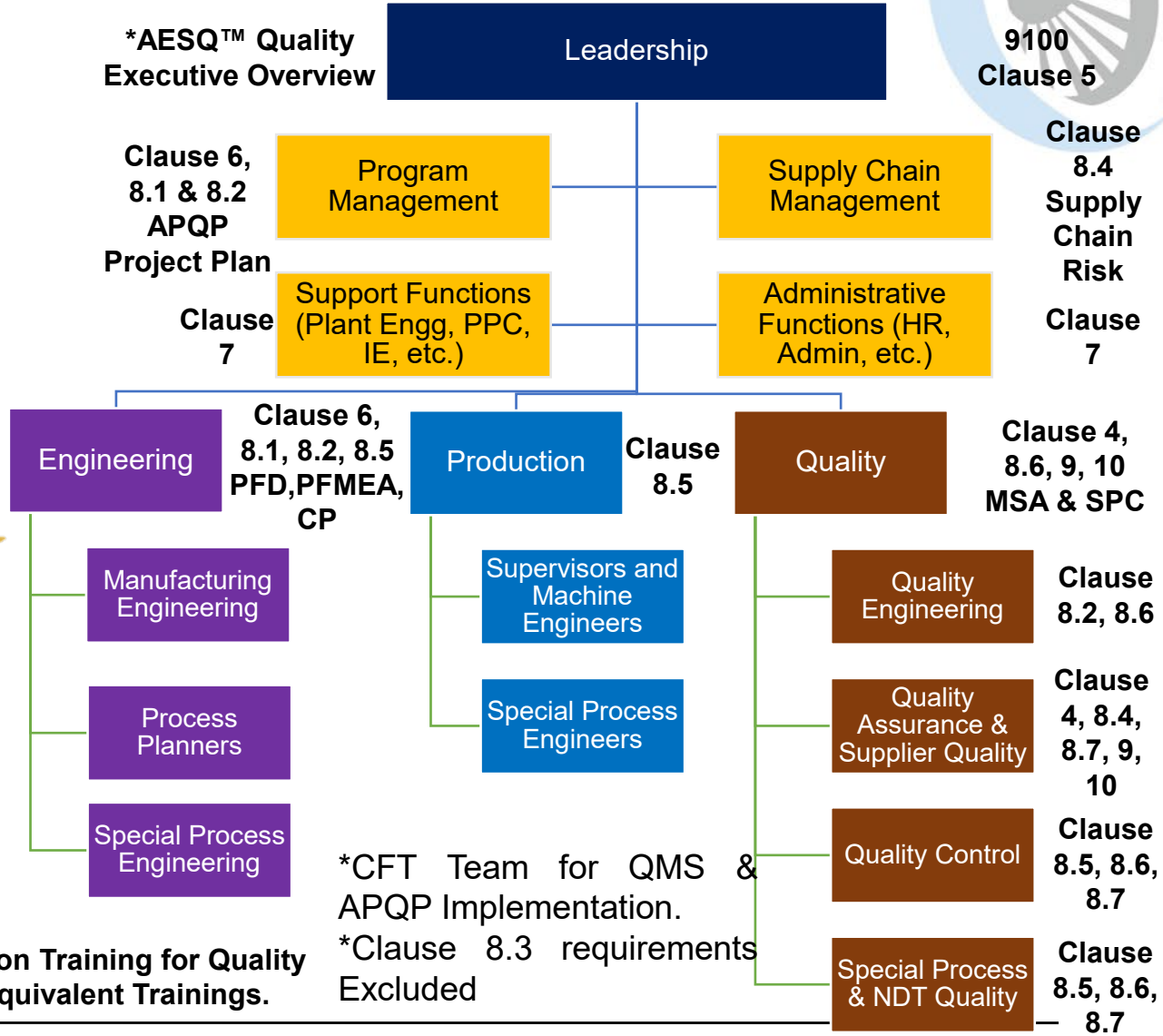
- Standardize and simplify the supplier quality flowdown requirements.
- Trainings to Sub-tier Cross Functional Teams for deployment.
- Support suppliers to improve current QMS processes.
- Periodic reviews on supplier performance and improvements.
- Integrate supplier surveillance audits to check effectiveness of implementation.
- Rewarding suppliers with best performance.



AS13100 PRACTITIONER & APQP CFT TRAININGS



***For FY 2022
AESQ™ Quality Foundation Training for Quality Leaders = QF204 and Equivalent Trainings.**



***CFT Team for QMS & APQP Implementation.
*Clause 8.3 requirements Excluded**

TOOLS FOR EFFECTIVE IMPLEMENTATION OF AS13100 (SOFTWARE TOOLS AND TEMPLATES)



8D Analysis Report

Customer Project Customer Complaint Internal Repeated Issue MRB Notification No

Source Insp. External Scrap RFT/RW Yes No

1. Define Team

Name

5. Define and Implement Corrective Action Plan

What Who Dept. EDC ADC Standardization Yes/No Who EDC

PFMEA Risk Register

3. Containment / Immediate actions

Actions

6. Evaluate

Verify the implementation of corrective & Preventive action

When Who Status Sign

8. Effectiveness verification

When Who Evidence verified Status Sign

*Team Sign off for the closure of RCCA (Team list shall be as per the 1st D-Define team)

6. Evaluate Results

Verify the implementation

Name Sign Name Sign Name Sign Name Sign Name Sign

TASL Templates

Work Instruction Documentation Plan

Completed On: _____

Approved by (Quality Engineer): _____

| Operation # | Operation Description | Workstation | Type of Documentation Required | | | | Type of Information Included in Documentation | | | | | | | | | | Status | | | |
|-------------|-----------------------|--------------|--------------------------------|-----------------------|-------------|------------------------------------|---|-------|--------|----------|-----------|---------|----------------|------------------|--------|--------------------------------------|--------|------------------|----------------------|------------------------------|
| | | | Work Instruction | Inspection/Facet Plan | Maintenance | Work Order/Collection Check Sheets | Control Plan | Tools | Gauges | Fixtures | Materials | Methods | Record Keeping | Quality Criteria | Safety | Documentation is Business Controlled | | Ready for Review | Approved by Operator | Approved by Quality Engineer |
| 10 | Material Release | None | X | X | | | | | | | | | | | | | | | | |
| 20 | Rough Mill | Excello 0305 | X | X | X | | | | | | | | | | | | | | | |
| 30 | Turn Off Side | Mazak 0027 | X | X | X | | | | | | | | | | | | | | | |
| 40 | Turn Fwd Side | Mazak 0028 | X | X | X | | | | | | | | | | | | | | | |
| 50 | Mill ID features | Okuma 2000 | X | X | X | | | | | | | | | | | | | | | |
| 60 | Deburr | Bench | X | X | X | | | | | | | | | | | | | | | |
| 70 | Clean | Spray booth | X | | | | | | | | | | | | | | | | | |
| 80 | FPI | FPI Line | X | X | | | | | | | | | | | | | | | | |

Customer Specific Templates

Production Readiness Review

Review Completed On: _____

Part Number: _____

Quantity: _____

Full Production Start Date: _____

| Item | Definition of Complete | Accountable | Status (Complete or Working) | Open Action Item(s) | Commit Date to close open items |
|-----------------------------|-------------------------|------------------------|------------------------------|---------------------|---------------------------------|
| 2.09 Feasibility Assessment | All Action Items Closed | Manufacturing Programs | | | |
| Manufacturing Planning | All Action Items Closed | Manufacturing Engineer | | | |
| Tooling | All Action Items Closed | Manufacturing Engineer | | | |
| Inspection and Gauging | All Action Items Closed | Quality Engineer | | | |
| Equipment & TPM | All Action Items Closed | Facilities Manager | | | |
| SPC | All Action Items Closed | Quality Engineer | | | |
| Sub-tier Management | All Action Items Closed | Sourcing/Procurement | | | |
| Workforce | All Action Items Closed | Human Resources | | | |
| Other Items | All Action Items Closed | Manufacturing Programs | | | |

Summary

Engine Program: _____ Value Stream: _____

PIN _____

Nomenclature _____

Source _____

Qty. Affected _____

Requirement _____

Condition _____

When Found / QEM issued _____

Est. resolve date _____

Impact to customer (int. & ext.) / Who? _____

Internal to Shop Customer Shop Engn. Assmt

Root Cause

How was the N/C generated? Why was the NC not detected? What is the Systemic Root Cause?

1st Why 1st Why 1st Why

2nd Why 2nd Why 2nd Why

3rd Why 3rd Why 3rd Why

4th Why 4th Why 4th Why

5th Why 5th Why 5th Why

Containment

Containment Actions

Corrective Action

Action

QMS Management Review

Agenda - Inputs

| Item | AS9100 | AS13100 |
|---|-------------------------------------|-------------------------------------|
| 1. Status of actions from previous management reviews | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. In external and internal issues that are relevant to the quality management system | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Customer satisfaction and feedback from relevant interested parties | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. The extent to which quality objectives have been met | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Process performance and conformity of products and services | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Nonconformities and corrective actions | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Monitoring and measurement results | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Audit results | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. The performance of external providers | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. On-time delivery performance | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. The adequacy of resources | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. The effectiveness of actions taken to address risks and opportunities | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 13. Opportunities for improvement | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. Recommendations for improvement | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. Cost of non-quality | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. Manufacturing / Assembly Right First Time | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. Customer scorecards (where available) | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 18. Human Factors reporting | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

AESQ™ Templates

APQP Project Charter

Deliverable Timeline definitions & Resource Management

Standard Process Libraries

Creating a Process Flow from the Library

Auto linked PFMEA

Inspection Validation - Auto generated from Control Plan

Problem Solving Linkage

Linkage of PFD/PFMEA/CP To APQP Projects

Deliverables Completion with Output Document attachments

Linkage PFMEA to Problem Solving

8D to PFMEA Link - 8D Induced to do list

POTENTIAL BENEFITS OF IMPLEMENTING AS13100



Improved Internal and External communication



Increased Throughput and Productivity



Improved Knowledge management



Error proofing product and process designs



Proactive, Early Detection and mitigation of quality and design issues



Adopt Industry Best Practices

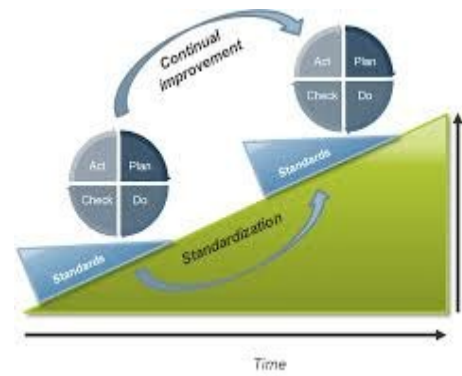


INDICATORS

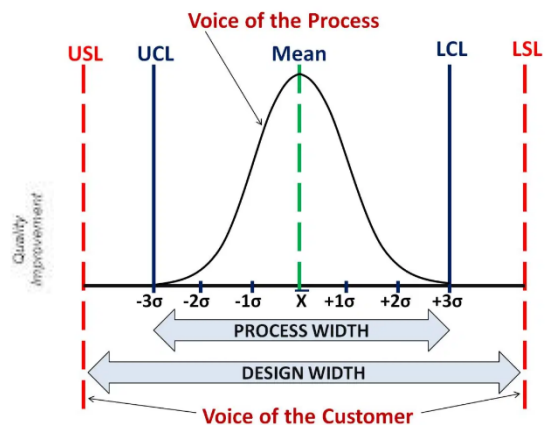
Aid to Meet Key Process Performance Indicators



Feedback based process Improvements



Promotes Continual Improvement



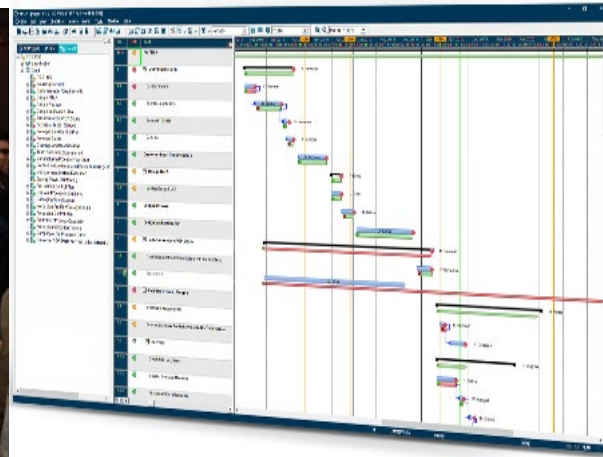
Evaluate and Improve process performance and capability

And Many More

AS13100 TRANSITION BEST PRACTICES & LESSONS LEARNT



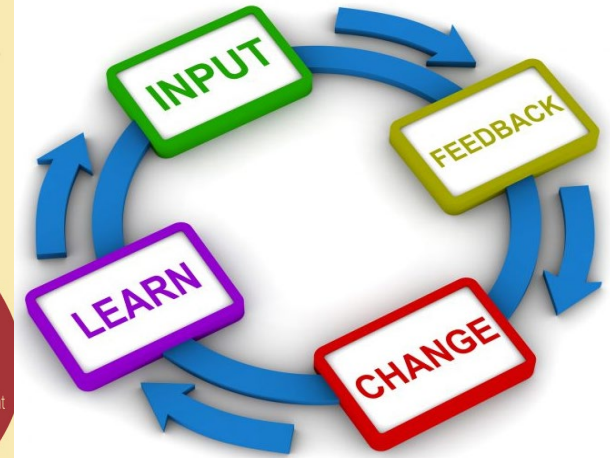
Early Engagement of Leadership and Customers



Integration of APQP and Program Management



Customer best practice deployment



Focus on Process Improvement Initiatives



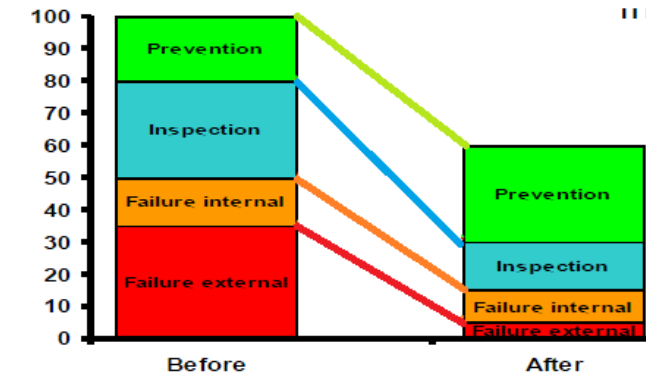
Promotes CFT involvement for Compliance and Improvements



Standardized Baseline Supplier Audit requirements

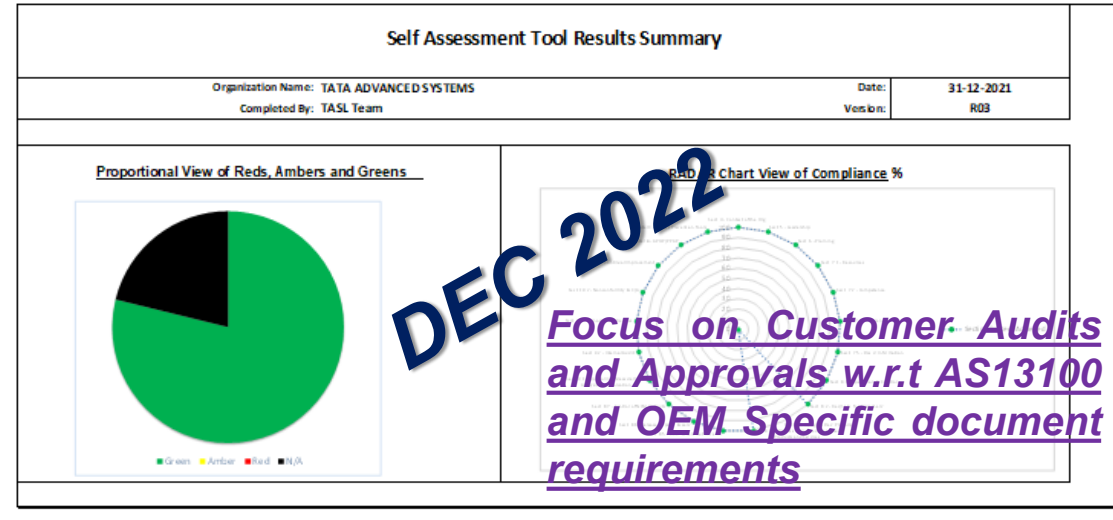
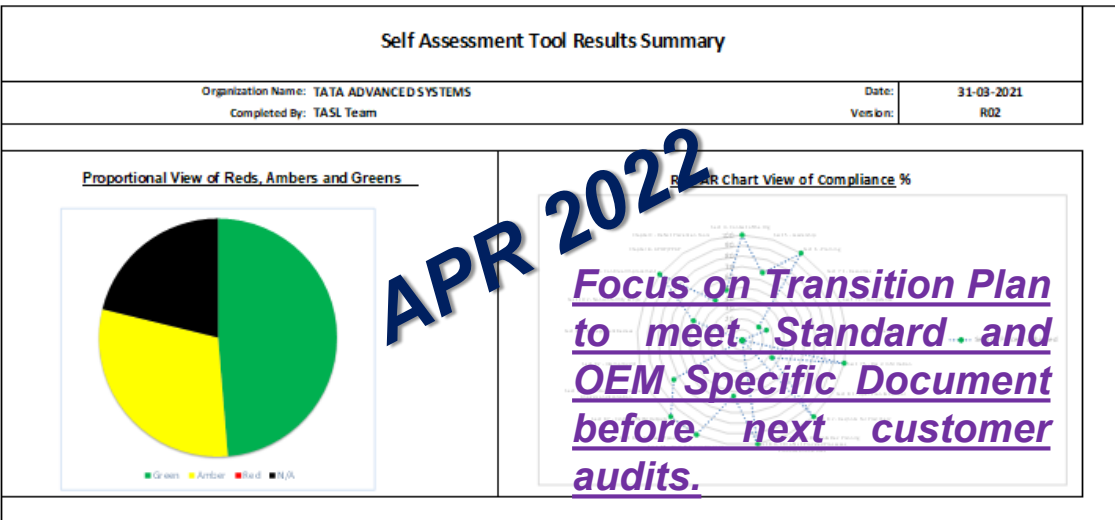
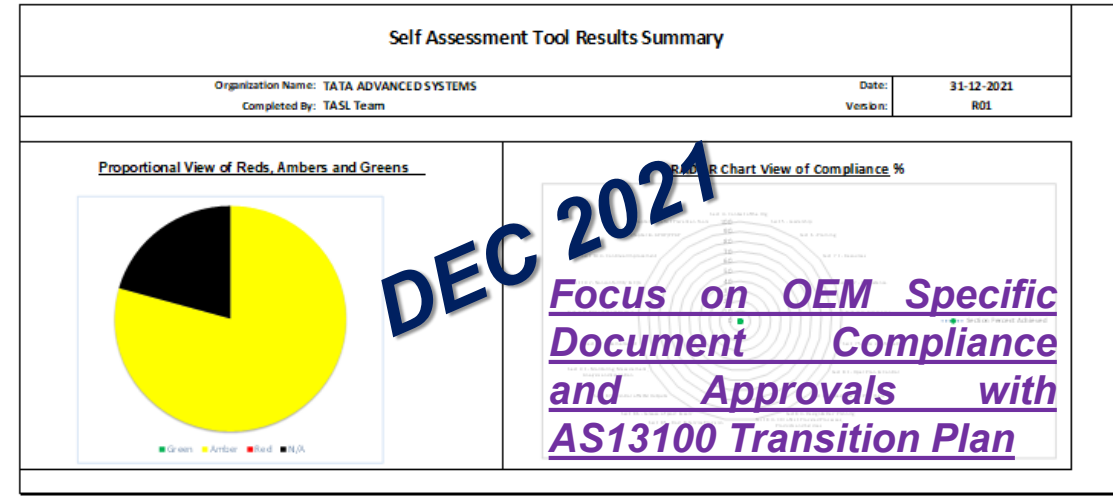
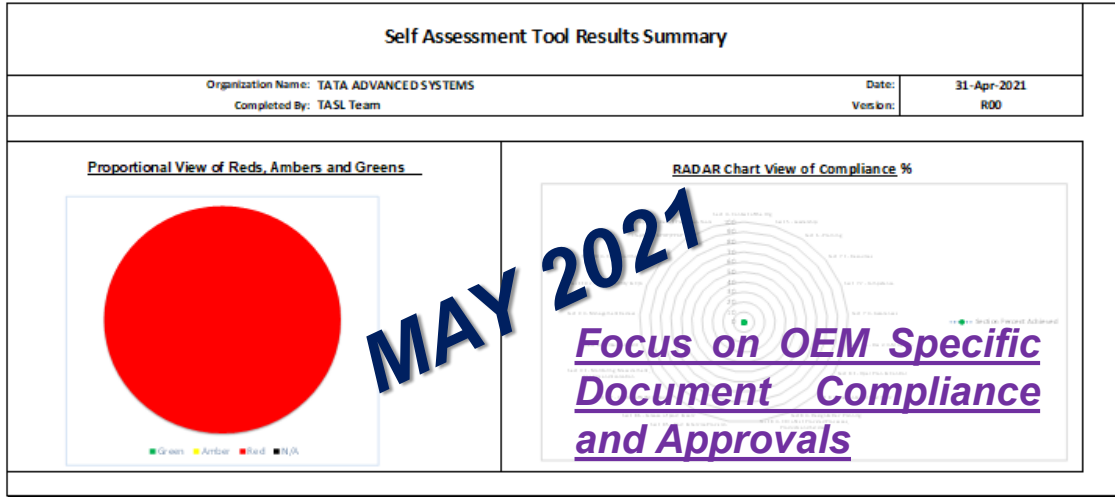
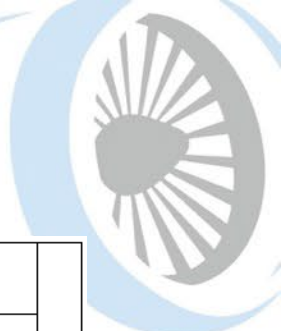


Enhances capability to meet KPI's and Customer satisfaction



Defect Prevention with Rapid Industrialization

TASL AS13100 TRANSITION PHASES AND FOCUS



AESQ – Aero Engine Supplier Quality Strategy Group

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AESQ

HOW TO GET INVOLVED



JUN SAKAI
CHIEF ENGINEER
IHI CORPORATION

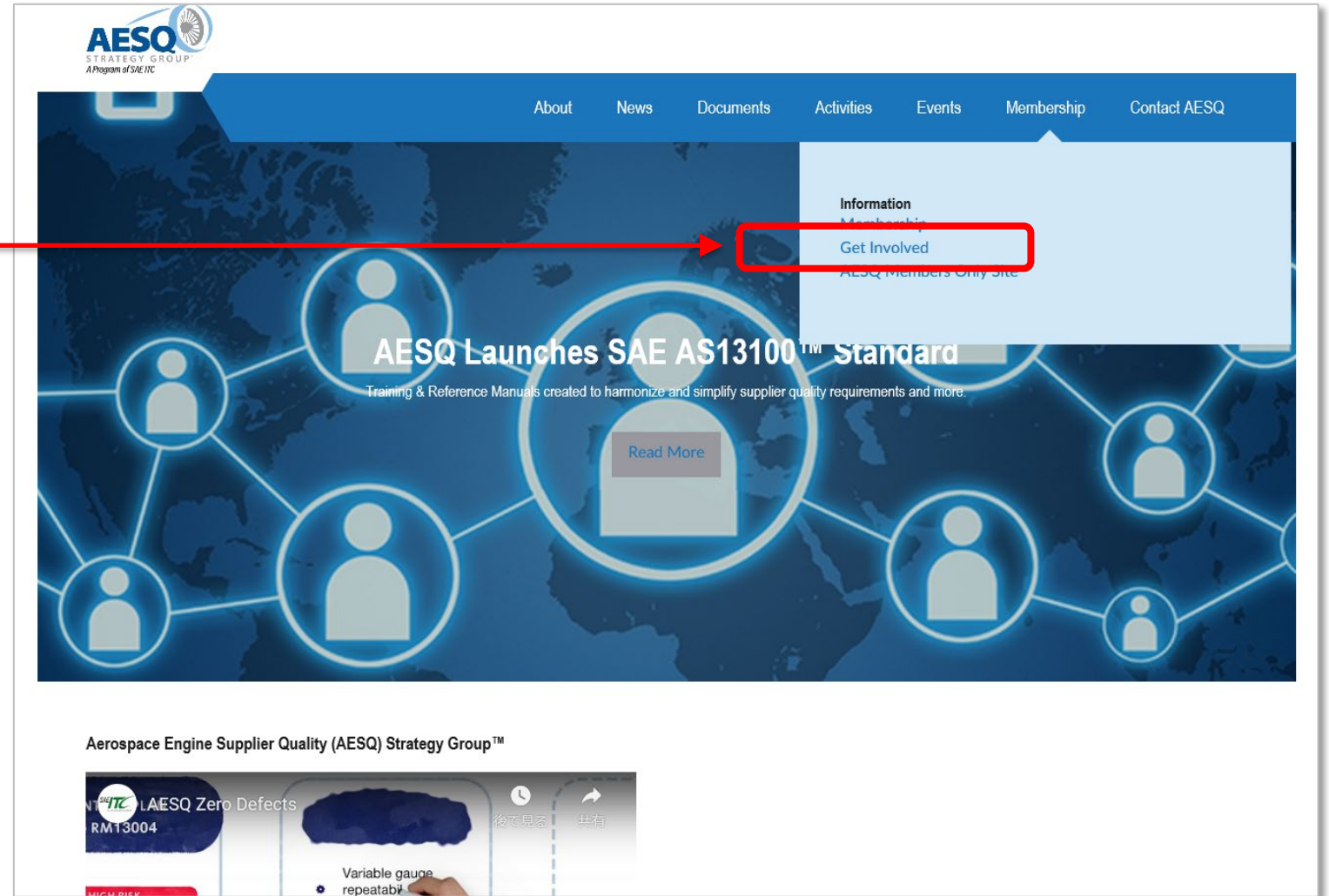
How to Get Involved - Overview



- 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

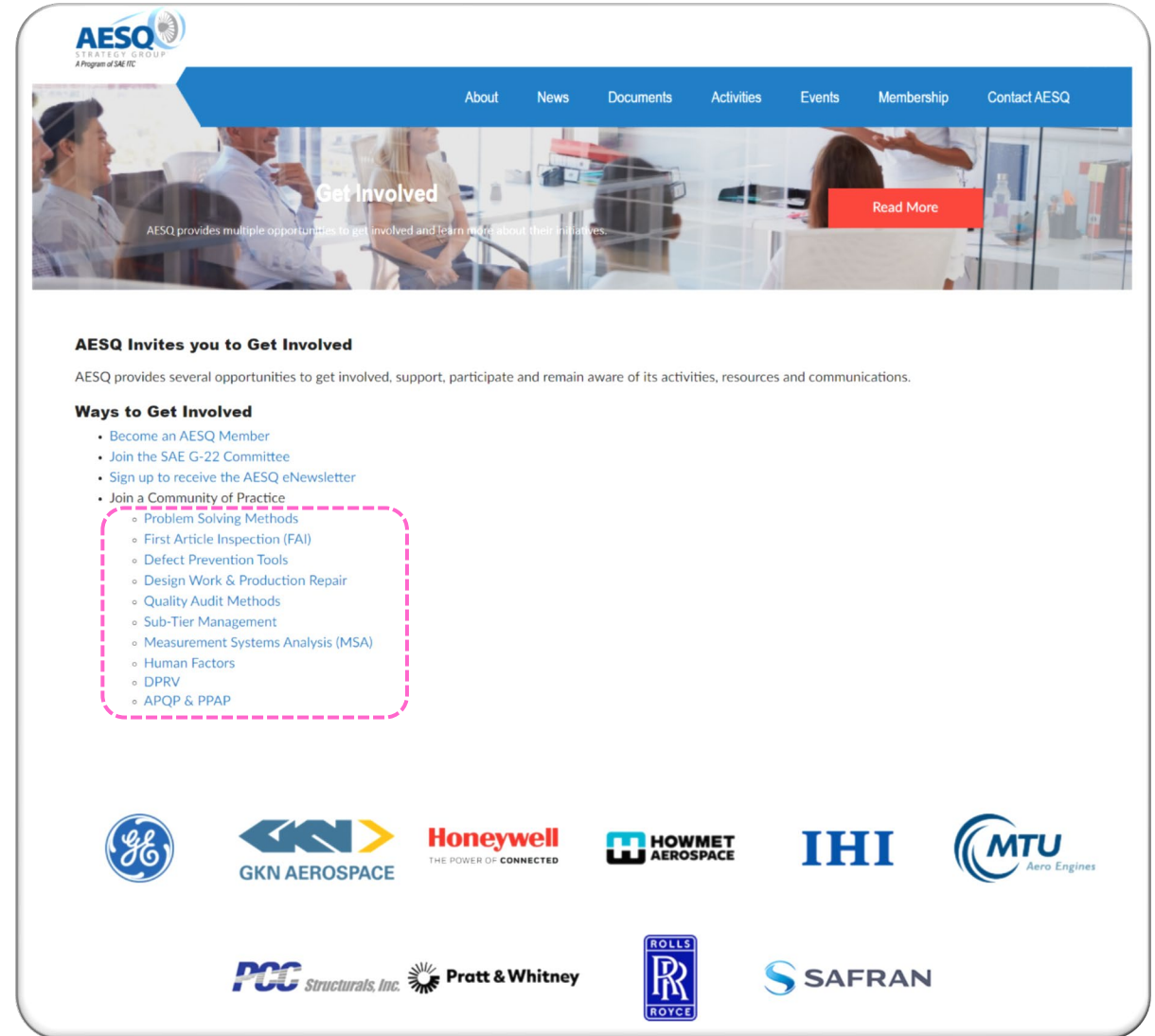
- Go to AESQ Homepage
<https://aesq.sae-itc.com/>
- Click “Get Involved”



“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



The screenshot shows the AESQ website's 'Get Involved' page. At the top is a navigation bar with links for About, News, Documents, Activities, Events, Membership, and Contact AESQ. Below the navigation bar is a hero image of people in a meeting, with the text 'Get Involved' and a 'Read More' button. The main content area features the heading 'AESQ Invites you to Get Involved' followed by a paragraph: 'AESQ provides several opportunities to get involved, support, participate and remain aware of its activities, resources and communications.' Below this is a section titled 'Ways to Get Involved' with a bulleted list: 'Become an AESQ Member', 'Join the SAE G-22 Committee', 'Sign up to receive the AESQ eNewsletter', and 'Join a Community of Practice'. The 'Join a Community of Practice' item is expanded to show a list of communities: 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, and APQP & PPAP. At the bottom of the page are logos for various aerospace companies: GE, GKN Aerospace, Honeywell, Howmet Aerospace, IHI, MTU Aero Engines, PCC Structural, Inc., Pratt & Whitney, Rolls Royce, and Safran.



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

- 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.

The screenshot displays two LinkedIn group pages. The left page is for the 'AESQ Human Factors (RM13010) Community of Practice' with 50 members. The right page is for the 'AESQ APQP & PPAP (RM13145) Community of Practice' with 191 members. Both pages show group descriptions, member lists, and a poll for the APQP/PPAP group.

AESQ Human Factors (RM13010) Community of Practice
 Members: 50
 Description: #AESQ encourages subject matter experts to engage with this Community of Practice to positively promote the use of Reference Manual RM13010 to support deployment of Human Factors in line with the SAE AS13100 Standard a...

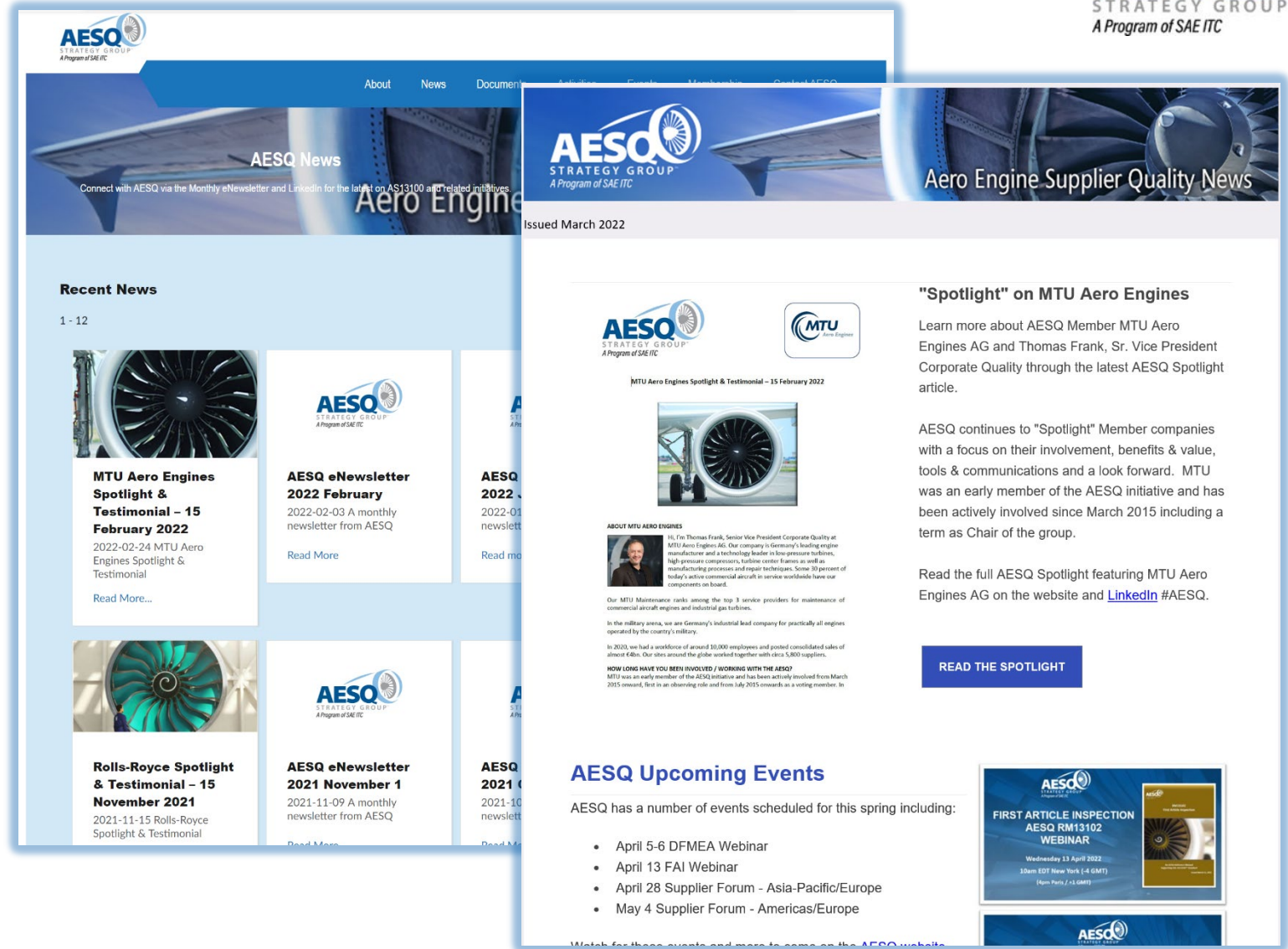
AESQ APQP & PPAP (RM13145) Community of Practice
 Members: 191
 Description: #AESQ encourages subject matter experts to engage with this Community of Practice to positively promote the use of Reference Manual RM13145 to support deployment of APQP & PPAP in line with AS13100 and to share best ...

Poll: The AESQ are planning a Webinar on APQP/PPAP. Which aspect will benefit your company?

| | |
|--------------------------------|-----|
| Creating the APQP Project Plan | 41% |
| Cross functional team working | 41% |

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

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



The screenshot displays the AESQ website interface. At the top, there is a navigation bar with links for 'About', 'News', 'Documents', 'Aero Engine', 'Aero Engine Supplier Quality News', and 'Aero Engine'. Below the navigation bar, a banner features the AESQ logo and the text 'Aero Engine' and 'Aero Engine Supplier Quality News'. The main content area is divided into two columns. The left column, titled 'Recent News', lists two articles: 'MTU Aero Engines Spotlight & Testimonial – 15 February 2022' and 'Rolls-Royce Spotlight & Testimonial – 15 November 2021'. The right column, titled 'AESQ Upcoming Events', lists several events: 'April 5-6 DFMEA Webinar', 'April 13 FAI Webinar', 'April 28 Supplier Forum - Asia-Pacific/Europe', and 'May 4 Supplier Forum - Americas/Europe'. A 'READ THE SPOTLIGHT' button is visible below the MTU article. The bottom of the page features a blue banner with the AESQ logo and the text 'Watch for these events and more to come on the AESQ website'.

“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



The screenshot shows the AESQ website's "Membership Opportunities" page. The header includes navigation links: About, News, Documents, Activities, Events, Membership, and Contact AESQ. The main content area features a large image of silhouettes of people in a meeting, with the text "Membership Opportunities" and "AESQ provide two levels of membership to engage with the Aero Engine supply chain." A red "Read more" button is visible. Below the image, the page is organized into sections: "Membership Overview" (welcoming new members), "Membership Benefits & Levels" (listing benefits like contributing to working groups, participating in forums, and gaining visibility), "Membership Levels" (distinguishing between Strategy Group Members and regular Members), and "Annual Membership Dues" (listing dues for Strategy Group Membership at \$8,000 and regular Membership at \$1,000 per organization per annum). A "Membership Application" link is at the bottom, followed by contact information: "For more information, please contact info@aesq.sae-itc.org."

“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 | |

AESQ – Aerospace Engine Supplier Quality Strategy Group

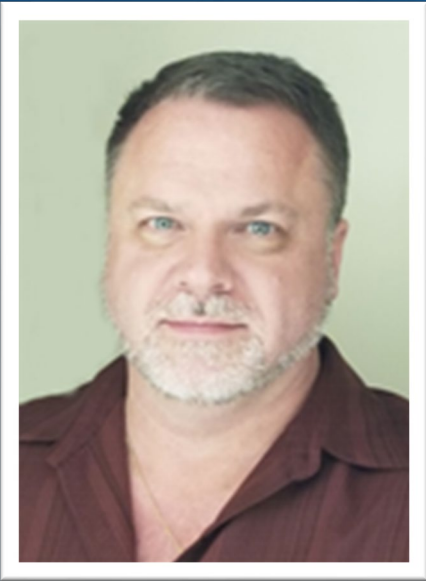
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“Get Involved” – Additional Options

- 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



UZAM KHAN
SUPPLIER QUALITY EXECUTIVE
ROLLS-ROYCE

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



AESQ – Aerospace Engine Supplier Quality Strategy Group

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