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QUALITY MANAGEMENT SYSTEM
DELIVERABLE SOFTWARE
9115 REVISION A
KEY CHANGES PRESENTATION
IAQG 9115 TEAM

May 2017

9100D / 9115 revision A

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BACKGROUND

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Background

- Reminder: AS9115 supercedes AS9006, which was published in March, 2003 as an Americas only standard
- Later Internationally adopted as 9115
- AS9115 - Software Supplement to AS9100
 - Adds specificity and granularity for compliance with the objectives of AS9100 requirements for Deliverable Software

Deliverable Software

- Developed or modified, airborne, shipborne, space borne or ground software
- Can be a stand alone deliverable software by contract line item or embedded in deliverable product
- Unmodified COTS components excluded



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- AS9115 SUPPLEMENTS
AS9100

- Clarifies 9100 requirements relative to deliverable software

Oversight of Certification Scheme				
9104-1 Requirements for ASD QMS Certification Program	9104-2 Oversight of ASD QMS Registration/ Certification Programs		9104-3 ASD Auditor Competency and Training Courses	
Certification Scheme QMS Standards	9100 QMS - Requirements for ASD Organizations			9101 QMS Audit Requirements for ASD Organizations
	9110 QMS - Requirements for Aviation Maintenance Organizations			
	9120 QMS - Requirements for ASD Distributors			
9102 First Article Inspection Requirement	9103 Variation Management of Key Characteristics	9107 Direct Delivery Authorization Guidance	9114 Direct Ship Guidance for Aerospace Companies	9115 QMS – Requirements for ASD Orgs – Deliverable Software
9116 Notice of Change (NOC) Requirements	9117 Delegated Product Release Verification	9131 Nonconformance Data Definition and Documentation	9132 Data Matrix Quality Reqs for Parts Marking	Qualification Procedure for Aerospace Standard Parts
9134 Supply Chain Risk Management Guideline	9136 Root Cause Analysis and Problem Solving	9138 Statistical Product Acceptance	9145 APQP / PPAP	9146 Foreign Object Damage
	9147 Unsalvageable Material		9162 Aerospace Operator Self-Verification Programs	

<http://www.sae.org/iaqg/organization/requirements.htm>



AS9100 Reference to AS9115

AS9100 Section titled “Intended Application” references AS9115:

NOTE: Organizations whose products are deliverable software, or contain deliverable software, should use the IAQG-developed 9115 standard (see Bibliography) **when planning and evaluating** the software design, development, or management activities of the organization. The 9115 standard provides guidance to the requirements of the 9100 standard when it is desired to add “software” to the 9100 quality management system scope.



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Example of standard AS9115 verbiage when AS9100 text applies with **NO** clarification needed for deliverable software

SAE INTERNATIONAL

AS9100™D

7.1.5.2 Measurement Traceability

When measurement traceability is a requirement or is considered by

7.1.5.2 Measurement Traceability

The requirements of 9100 apply. No clarification required for software.

7.1.6 Organizational Knowledge

The requirements of 9100 apply. No clarification required for software.

AS9115



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Example of standard AS9115 verbiage when AS9100 text applies **WITH** clarification needed for deliverable software

SAE INTERNATIONAL	AS9100™D
7.2 Competence	7.2 Competence
The organization shall:	The organization shall:
a determine the necessary competence of person(s) doing work under its control	

7.2 Competence	AS9115
The requirements of 9100 apply with the following clarification for software.	
Software practitioners (e.g. Engineering, Quality, Testers) shall be qualified	





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REASONS FOR REVISION

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ISO 9001 / 9100 core reasons for change

- Adapt to a changing world
- Enhance an organization's ability to satisfy its customers
- Provide a consistent foundation for the future
- Reflect the increasingly complex environments in which organizations operate
- Ensure the new standard reflects the needs of all interested parties
- Integrate with other management systems



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The “9100” needs to change, to:

- Incorporate changes made by ISO TC176 to the ISO 9001:2015 requirements
(ISO liaison organized to collaborate with the IAQG 9100 team and to obtain consideration for IAQG requirements)
- Consider Aviation, Space and Defense stakeholders’ needs identified since the last revision
(web survey performed in 2013)
- Consider clarifications to 9100 series requests issued by IAQG since the last revision
(requirements clarified or notes added)



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Why “9115” needed to change:

- AS9100 changed to align with ISO 9001:2015
- Respond to changes in software development methods
- Consider threat profiles to Aviation, Space and Defense software systems – adds themes of cybersecurity
- Advances in tools, simulations and testing capabilities
- Recognize the expanded scales of software impact such as cloud based services, mobile apps, small embedded web based servers and networked appliances
- Ensure mitigation of potential quality concerns are met for software
- Disposition the collection of feedback related to 9115 since 2010





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9100 REVISION D / 9115 REVISION A

HIGH LEVEL STRUCTURE

9100 revision D

High Level Structure (from ISO 9001)

High Level Structure

- ISO is going from 8 clauses to 10 clauses



Rationale

- Better alignment to business strategic direction
- With PDCA approach
- More compatible with other management system standards

Implementation Considerations

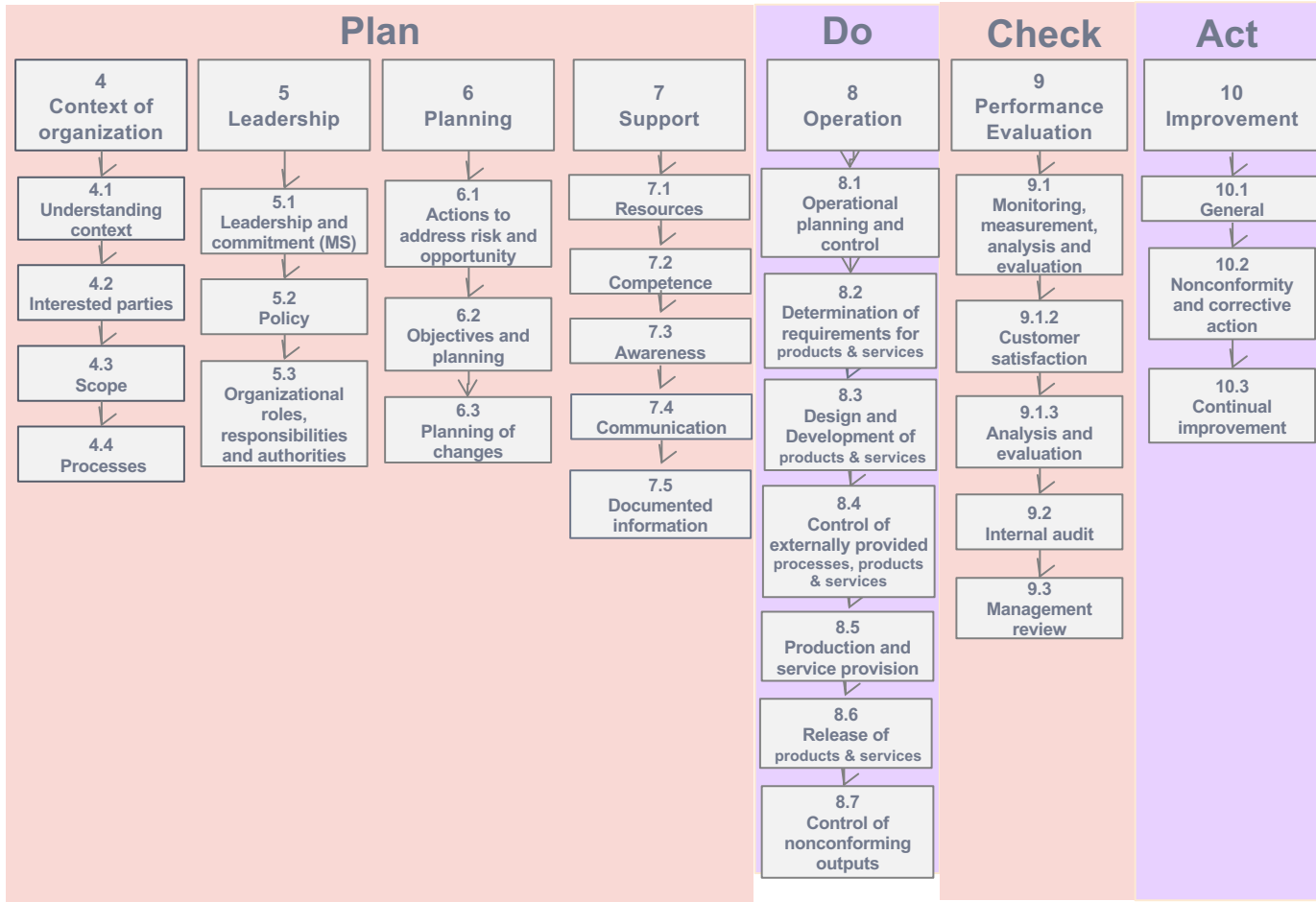
- Review your current QMS structure

(preferable to adapt the QMS structure to the Business Processes)

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9100 revision D

High Level
Structure
(from ISO 9001)





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KEY CHANGES

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High quality software is not enough

- In the past, software had to meet functional and safety requirements
- This alone is no longer adequate
- Now, software and it's environment must also be SECURE – Information Assurance



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Understanding: Information Assurance, Information Security and Cybersecurity

Information Assurance as defined in AS9115:

“The set of activities needed to protect information and information systems by ensuring availability, integrity, authentication, confidentiality, and non-repudiation including protection, detection, and reaction capabilities.

This includes activities conducted to reduce vulnerability of operational networks, Information Technology (IT), and computing equipment. Activities may include development of innovative and cost-effective ways to mitigate those vulnerabilities. IA may include actions to provide assured access, and transparent identification and authentication across the network or within systems of systems.”

Source: [IAQG International Dictionary](#)



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Significant addition to 9115 standard:
Enhanced cybersecurity requirements



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Cybersecurity derived themes

- Culture of Security
- Technical Security
- Software Life Cycle Security
- Supply Chain Security
- Internal Audit of Cyber Security
- Notification, Response, and Recovery

NIST Cybersecurity Framework (NIST 800-53)

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- 1.0 – Scope: provides inclusion of **mobile applications**, and **services** (e.g. cloud environment, web hosted solutions or platforms)
- 3.0 – Terms and Definitions:
 - Information Assurance – new definition
 - Interested Parties – replaces Stakeholder
 - Non-developmental Software – added Government off-the Shelf (GOTS) software to definition
 - Software Life Cycle – slight definition revision to provide clarity
 - Support Software – slight definition revision to provide clarity
 - Validation – slight definition revision to provide clarity
 - Verification – slight definition revision to provide clarity



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Note: this is the most impactful IA requirement added



- 4.0 – Context of the Organization:
 - Requirement for Organizations to include the appropriate Information Assurance elements when determining the scope of the organization’s QMS.
 - See the IAQG Supply Chain Management Handbook ([SCMH](#)) for further information.



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- 6.0 – Planning:
 - Adds software services to the list of considerations for Risk Management
 - This should include external providers, when appropriate
- 7.0 – Support:
 - 7.1.3 and 7.1.4: Focuses on information assurance considerations in infrastructure
 - 7.2: Ensures competence appropriate for the criticality and complexity to support customer and system requirements
 - 7.5.3: Requires resource retention to access legacy data



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- 8.0 – Operation:
 - Software planning addresses software related activities from project planning through product delivery and maintenance
 - Quality objectives and requirements expressed in measurable terms, including critical items and key characteristics
 - Defined rules, practices, conventions, techniques, and methodologies for development and test
 - Strong software configuration management guidance
 - Focus on product integrity and safety
 - Prevention of counterfeit software (8.1.4)



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- 9.0 – Performance Evaluation:
 - Software organizations analyze and evaluate industry data on emerging threats and vulnerabilities
 - Internal audits include software aspects of the QMS



Support materials on 9115 and software QMS:

[IAQG Supply Chain Management Handbook](#)

Home	<h3>Supply Chain Management Handbook (SCMH)</h3> <p>Terms of Use</p> <p>The SCMH materials are provided without copyright restriction by the IAQG to assist with the advancement of best practices within the Aviation Space and Defense Industries (AS&D). Use of the SCMH and its contents is at the discretion of the user, and the applicability and suitability of the materials is the sole responsibility of the user. Reproductions of SCMH materials in whole or in part is permitted provided it is acknowledged in any presentation or use that the source of the material is the IAQG SCMH and it is the intellectual property of the IAQG for the benefit of the AS&D industry.</p> <p>Should SCMH materials either in whole or in part be used for internal or external training, informational dissemination, or presented to third parties without formal agreement of IAQG, the presentation or training shall NOT be represented as being IAQG approved or an SCMH initiative. Modifications or additions to the SCMH materials may be incorporated so long as it does not change the context or objectives of the material.</p> <p>The incorporated IAQG maintains intellectual property rights to the SCMH materials.</p> <p>Do you accept these Terms?</p> <p>Accept Terms and Launch SCMH ></p>	Quick Links
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	Acronyms	

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Questions?

IAQG

Raymond Wright – IDR
raymond_wright@raytheon.com

AAQG

Inez Gronewold – SDR
inez.gronewold@collins.com

APAQG

Satoshi Kikuchi – APAQG SDR
s-kikuchi@hirec.co.jp

EAQG

Hartwig Flory – EAQG SDR
hartwig.flory@airbus.com





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