SAE INTERNATIONAL

SAE AEROSPACE STANDARDS

Overview and Highlights

21.06.2016

THE IMPORTANCE OF STANDARDS

THE IMPORTANCE OF GLOBAL STANDARDS

Standards provide benefits such as:

- Defining accurate and necessary measurements
- Lowering product costs
- Improving product performance, quality, uniformity, interoperability and functionality
- Providing a method to improve health, safety, the environment, communications, competition, international trade
- Improving the quality of life

ENABLE SAFER AND MORE EFFICIENT AVIATION

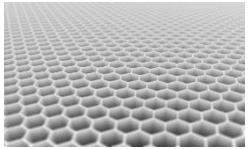
Approximately 1800 SAE International standards are used in the development of a typical aircraft.

The first aerospace standard was written in 1916.

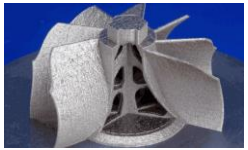
Today there are over 8500 active aerospace standards and over 17500 historical standards in circulation.

OVERVIEW OF SAE STANDARDS

NEW SAE AEROSPACE STANDARDS FOR CUTTING EDGE TECHNOLOGIES



Composite Materials

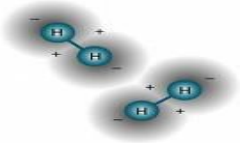


Additive Manufacturing

Fiber-optic networks

Active RFID Tags

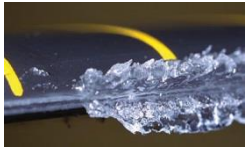
Hydrogen Fuel Cells



LED Runway Lighting and EFVS

Electronics & Avionics Corrosion Protection

Human Factors & Cockpit Electronics



Anti-Icing Technology

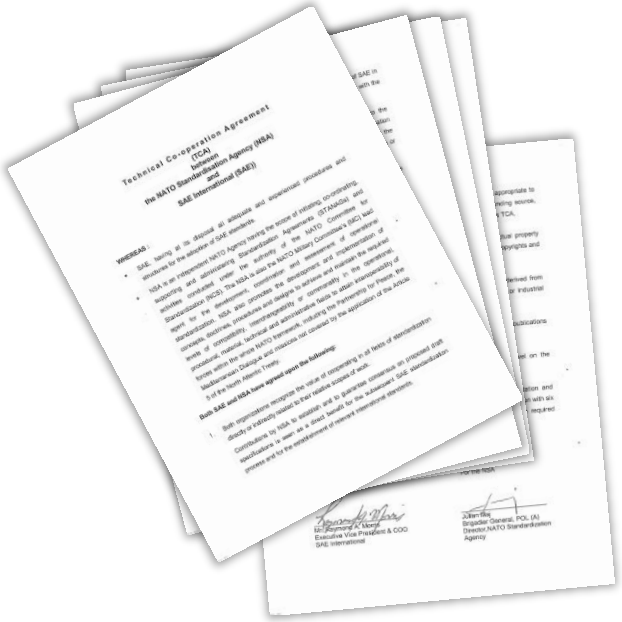
Integrated Vehicle Health Management & Prognostics

Electric & More Electric Aircraft

SAE AEROSPACE STANDARDS PROGRAM TOPICS

- Metals finishes, processes, fluids
- Nonferrous alloys
- Carbon & Low alloy steels
- Specialty steels and alloys
- Corrosion & heat resistant alloys
- Titanium
- Beryllium
- Refractory materials
- Metals engineering
- Elastomers
- Polymers
- Composite materials (fabric & resins)
- Composite repair materials
- Composite inspection
- Composite repair techniques
- Organic Coatings
- Seals and Sealants
- Maintenance chemicals and materials
- Greases
- Lubricants
- Nondestructive testing and inspection
- Mechanical/Electrical/Hydraulic actuators
- Hydraulic fluids
- Filtration
- Tubing
- Hydraulic components
- Fuel, oil, and oxidizer systems
- Pumps
- Couplings, Fittings, Hose
- Tubing installation
- Engine starting systems
- Auxiliary Power
- Nuts/Inserts
- Bolts/studs/screws
- Fluid connectors
- Ignition systems
- Emissions measurement
- Engine condition monitoring
- In-flight propulsion measurement
- Engine controls
- Support equipment and tools
- Helicopter powerplants
- Inlet flow distortion
- Avionics networks
- Aircraft store integration
- Avionic subsystems
- Embedded computing systems
- Architecture description language
- Fiber optics
- Unmanned systems
- Lightning
- Electromagnetic compatibility
- Electrical Power and equipment
- Power management
- Aircraft systems installation
- Protective devices
- Relays
- Electrical connectors
- Terminating Devices
- Wire & cable
- Safety assessment
- Human Factors
- Flight Deck tools and instruments
- Displays
- Human modeling
- Quality system standards
- Fuel operations
- Radio Frequency Identification
- Air cargo handling
- Aircraft ground equipment and systems
- Aircraft servicing
- Aircraft Deicing
- Airport snow and ice removal
- Landing gear systems
- Oxygen equipment
- Aircraft interior/exterior lighting
- Aircraft noise measurement
- Environmental systems
- Aircraft icing
- Safety equipment
- Cabin interiors
- Survival equipment
- Seats
- Maintainability
- Probabilistic Methods
- Reliability
- Structural Health Monitoring and Management
- Air Traffic Management
- Integrated Vehicle Health Management

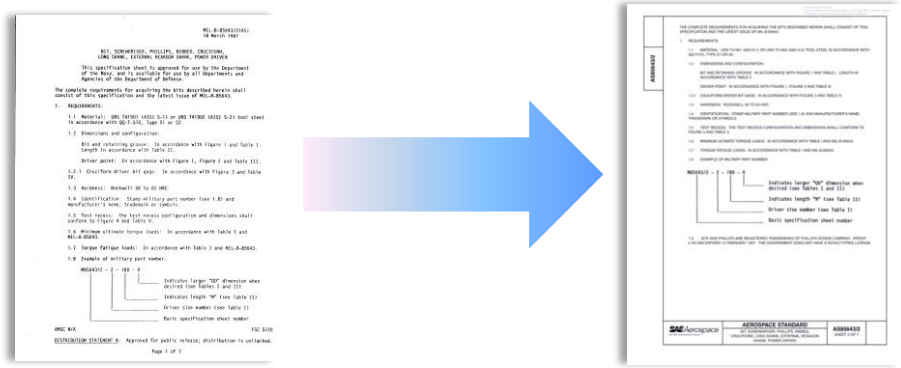
SAE and NATO



SAE is an officially recognized civilian SDO partner to NATO

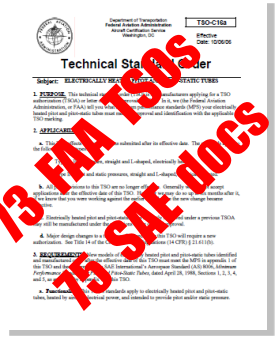
Through a Technical Cooperation Agreement, NATO supports and adopts SAE industry standards

SAE and U.S. DEPARTMENT OF DEFENSE

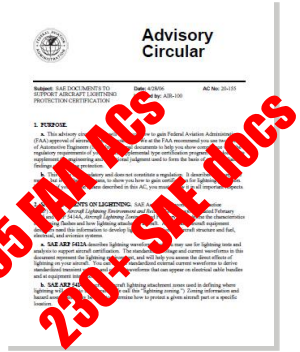


- Over 1500 Mil-Specs have been converted to SAE standards
- The US DoD has adopted more documents SAE from than any other SDO
- http://www.sae.org/standardsdev/military/

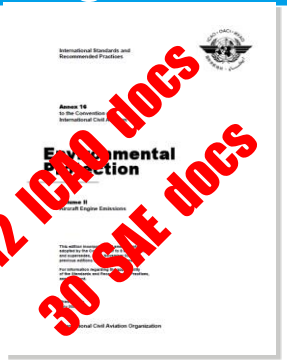
Regulations and government documents reference SAE standards to certify aircraft before entering the market.



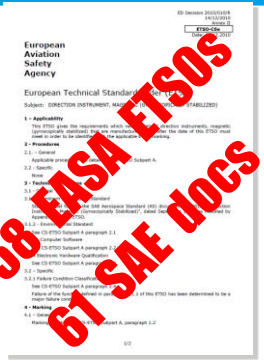
Example FAA TSO
Mandatory compliance



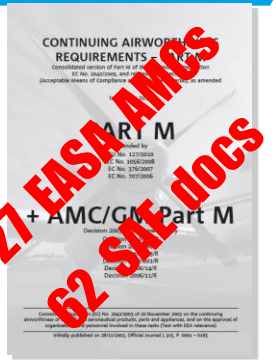
Example FAA AC
Guidance material



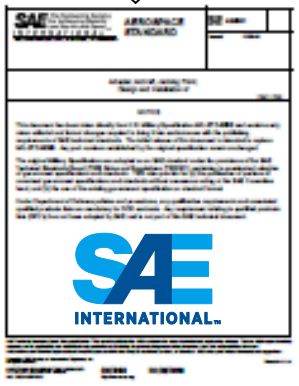
Example ICAO Annex
Mandatory compliance



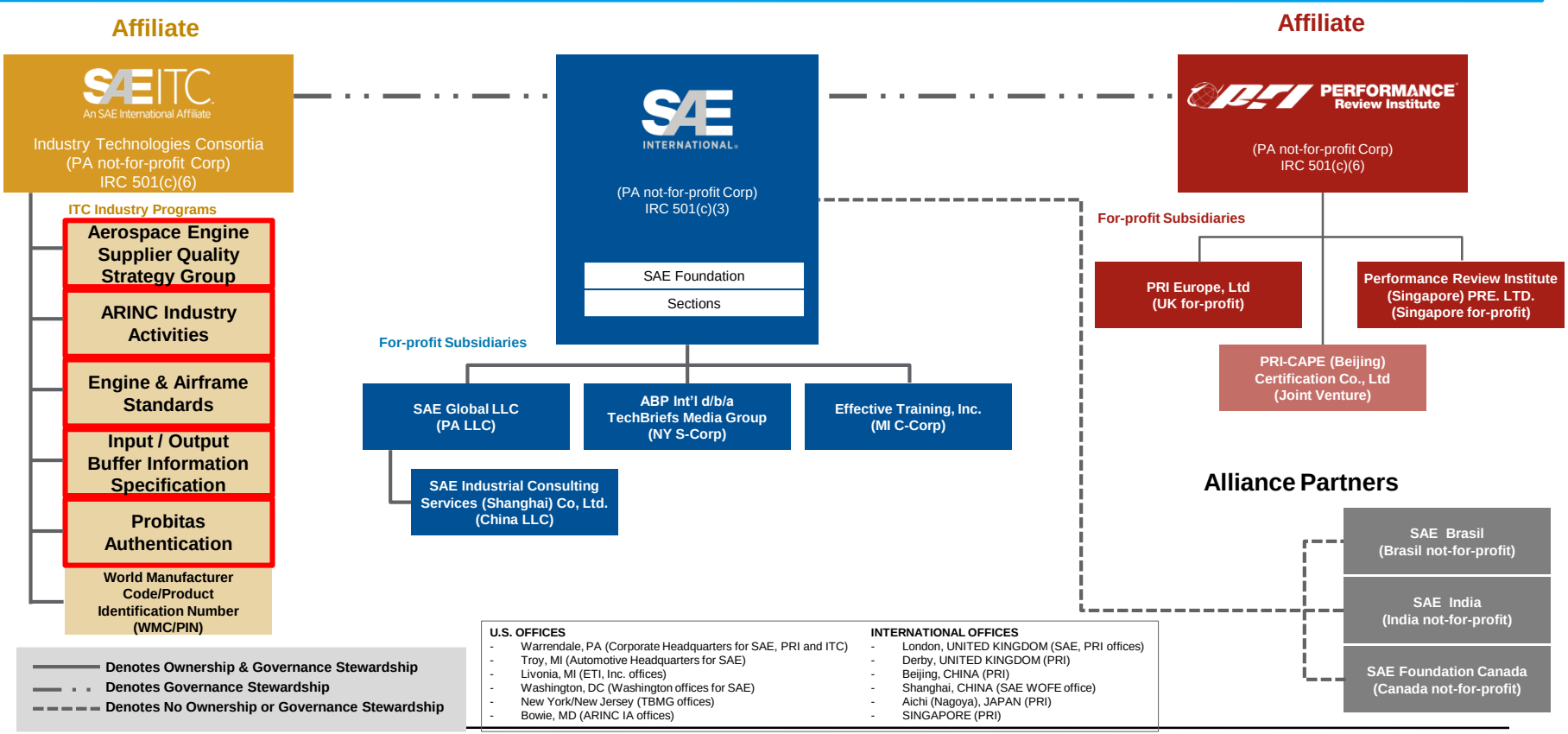
Example EASA ETSO
Mandatory compliance



Example EASA AMC
Guidance material

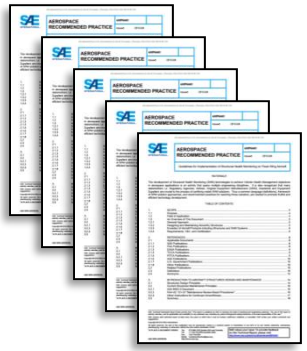


SAE Group – Aerospace Standards



SAE Aerospace Standards by the Numbers

Systems Groups	10
Steering Groups	2
Technical Committees	181
Standards	8,500+
Document Types AS, AMS, ARP, AIR	4
Unique Participants	8,300+
Total Participation	17,600+



Major Global Aerospace Organizations Develop SAE Standards

SAE Aerospace Council, Global Custodians: Oversight and Governance

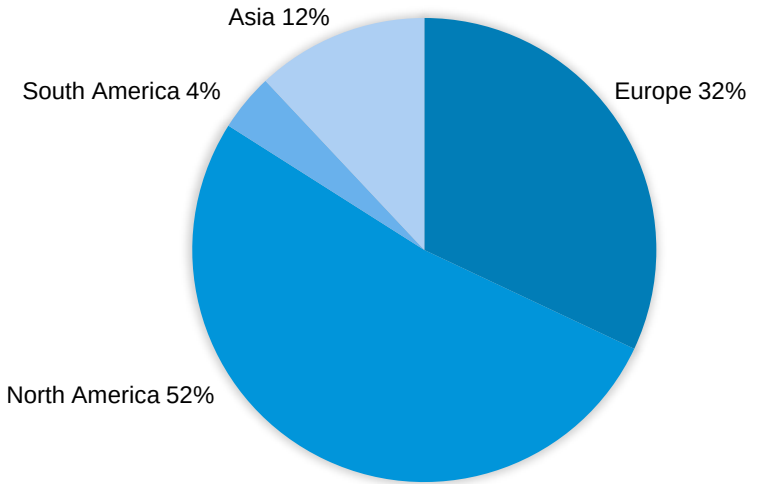
Airbus	FAA
Airbus Group	Finmeccanica
A4A	GE Aviation
AVIC	Gulfstream Aerospace
BAE Systems	Honeywell Aerospace
Boeing	Lockheed Martin
Bombardier	Lufthansa Technik
Aerospace	Northrop Grumman
CAPE	Pratt & Whitney / UTC
CIRA	Rolls-Royce (Chair)
COMAC	United Aircraft Corporation
EASA	U.S. Department of Defense
Embraer	Wichita State University

April 2016 Meeting in Beijing

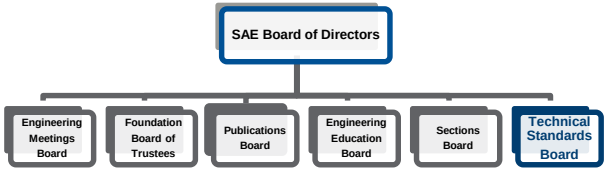
Stakeholders:
Industry, Operators, Government, Research

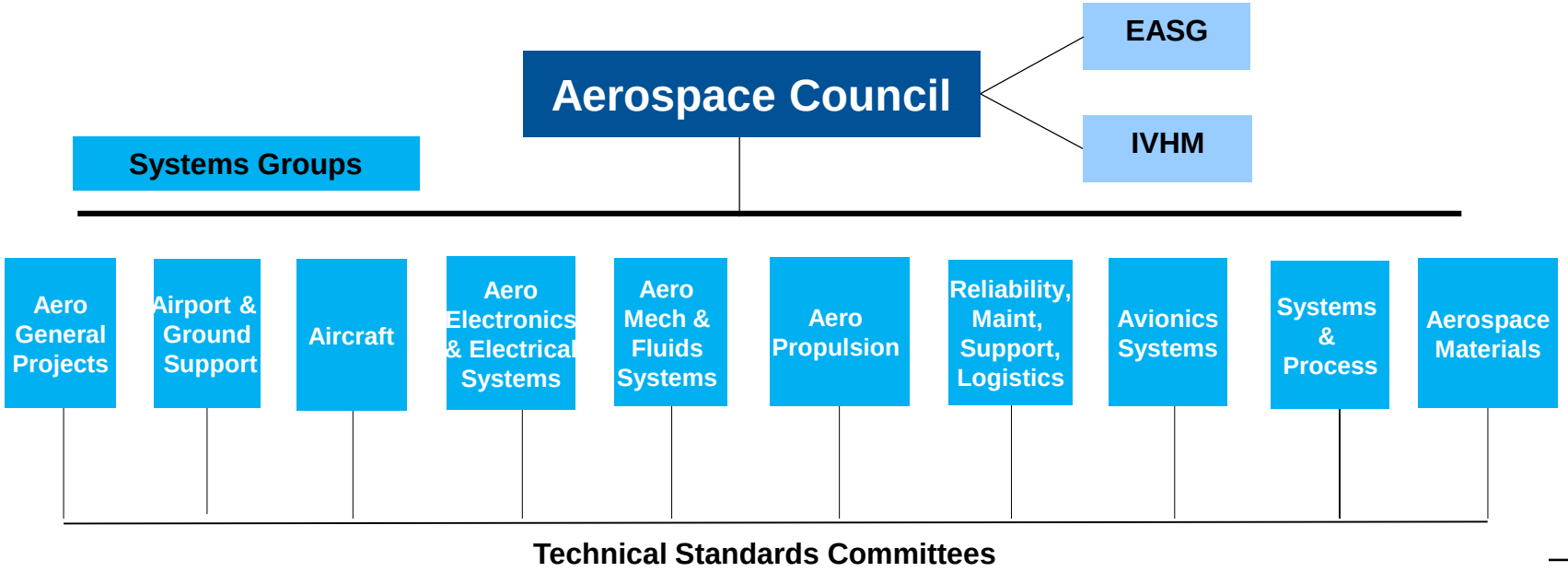
ICAO Observer Role

Matching the Industry



SAE Organizational Structure: Council Level





SAE Standards - Technical Breadth

Large scope of topics:

- **Parts, Materials**
- **Mechanical, Electronic/Avionic/Wireless, ICT**
- **Platform, Systems, Subsystems**
- **Cross-cutting technologies**
- **Management & Process Standards**
  - **e.g. Safety Assessment, Quality and Counterfeit Avoidance**

Through Life Usage:
Design, Certification, Manufacturing, Operation, Maintenance

One Forum, One Standard

Transparent, Efficient, Industry-Managed Standards Development

- **The document is proposed**
  - By industry
  - By regulator
  - For revision
- **The draft is created by the committee**
- **The draft document is balloted – by committee. 50% Quorum and 75% Approval required**
- **Required changes made; affirmation ballot and Council Ballot**
- **The document is published by SAE**

~18 months standard development time

Types Of SAE Standards

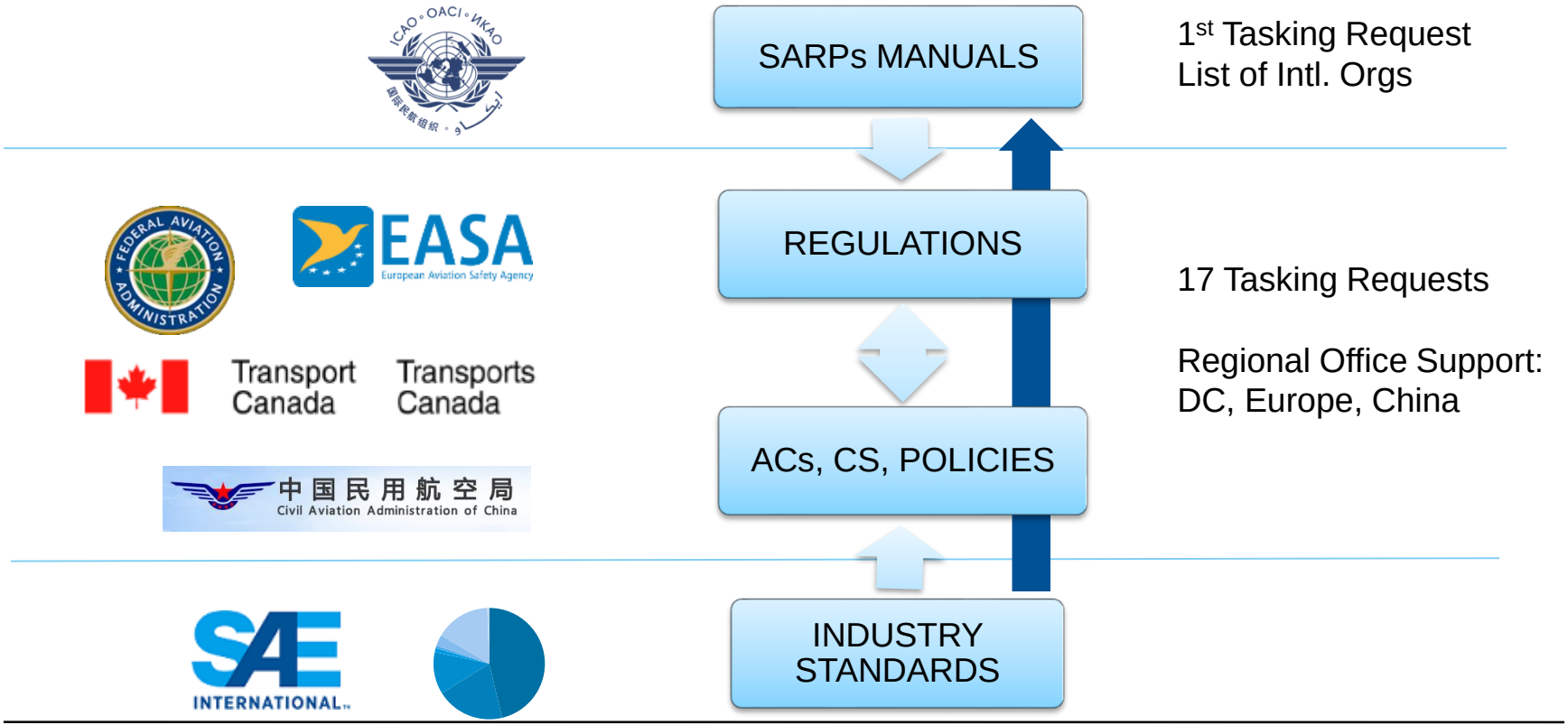
AS Aerospace Standards – specific performance requirements used for design standards, parts standards, minimum performance standards, quality and other areas conforming to broadly accepted engineering practices or specs for a material, product, process, procedure or test method

AMS Aerospace Material Specifications – specific performance requirements for material and process specifications

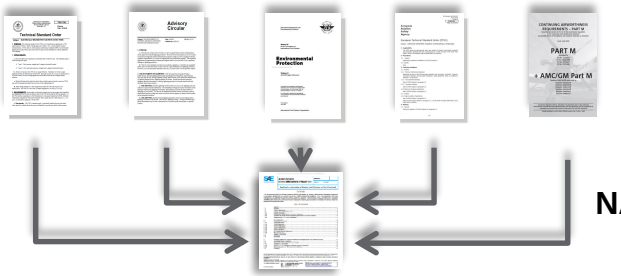
ARP Aerospace Recommended Practices – documentations of practice, procedures, and technology that are intended as guides to standard engineering practices. May be of a more general nature or propound data that have not yet gained broad acceptance.

AIR Aerospace Information Reports – compilations of engineering reference data, historical information, or educational material useful to the technical community

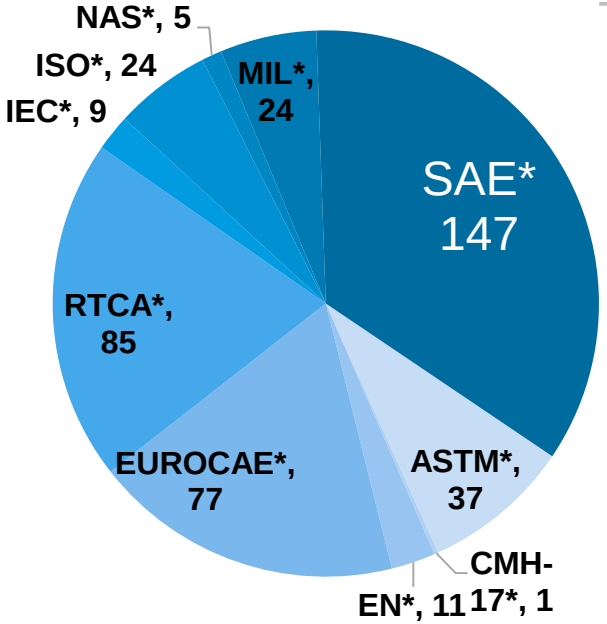
The Public-Private Partnership: Civil Aviation



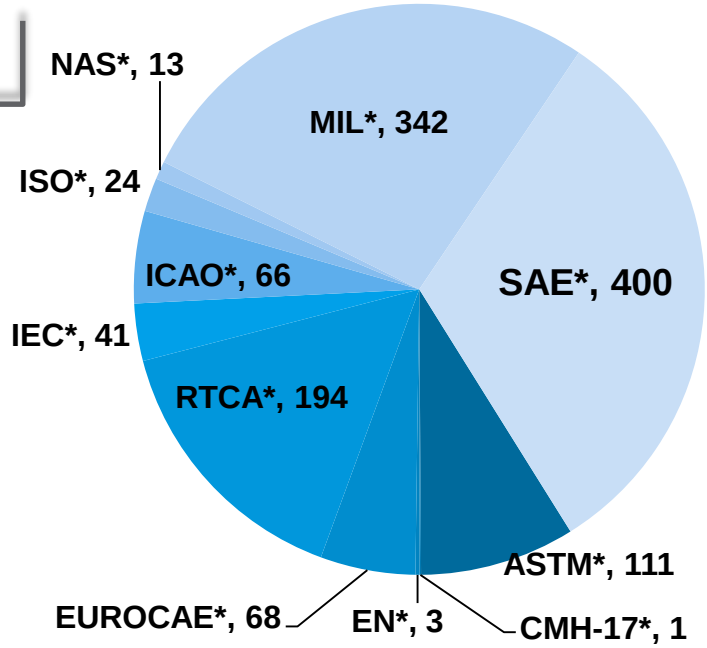
Standards Referenced in EASA & FAA Regulations



EASA

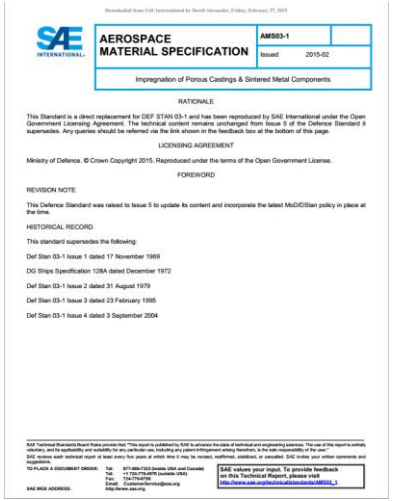


FAA



SAE And “DefStan Reform”

- ✓ **SAE maintains over 1,500 former US MilSpecs as industry standards – since early 2000s**
- ✓ **SAE International has worked with DStan to transfer 17 DefStan's to SAE standards**
- ✓ **The first such standard, *Impregnation of Porous Castings & Sintered Metal Components* was converted to SAE AMS03-1 and was published on February 24th 2015**
- ✓ **A successful embodiment of DStan’s civil standards campaign**
- ✓ **With an agreed process in place and successfully tested, further transfers are anticipated**
- ✓ **Partnership on NATO Civil Standards Campaign**



SAE INTERNATIONAL

AEROSPACE MATERIAL SPECIFICATION

AMS03-1

Issued 2015-02

Impregnation of Porous Castings & Sintered Metal Components

RATIONALE

This Standard is a direct replacement for DEF STAN 03-1 and has been reproduced by SAE International under the Open Government Licensing Agreement. The technical content remains unchanged from Issue 5 of the Defence Standard it supersedes. Any queries should be referred via the link shown in the feedback box at the bottom of this page.

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FOREWORD

REVISION NOTE

This Defence Standard was raised to Issue 5 to update its content and incorporate the latest MoD/DStan policy in place at the time.

HISTORICAL RECORD

This standard supersedes the following:

Def Stan 03-1 Issue 1 dated 17 November 1969

DG Ships Specification 128A dated December 1972

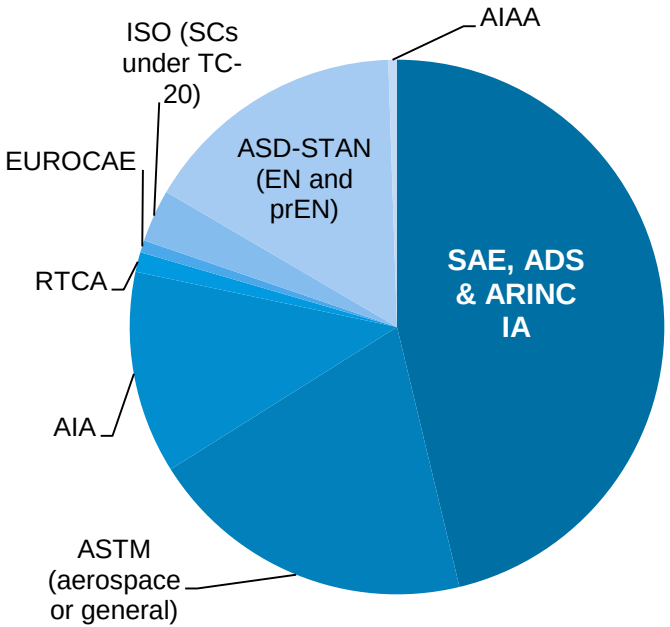
Def Stan 03-1 Issue 2 dated 31 August 1979

Def Stan 03-1 Issue 3 dated 23 February 1995

Def Stan 03-1 Issue 4 dated 3 September 2004

SAE values your input. To provide feedback on this Technical Report, please visit

Aerospace Standards Landscape



SAE INTERNATIONAL

AEROSPACE STANDARD	AS6254™	REV. A
	Issued 2012-02 Revised 2015-12 Superseding AS6254	
Minimum Performance Standard for Low Frequency Underwater Locating Devices (Acoustic) (Self-Powered)		

2.1.1 SAE Publications

AS8045 Minimum Performance Standard for Underwater Locating Devices (Acoustic) (Self-Powered)

2.1.2 ASTM Publications

ASTM D1141-98 Standard Practice for the Preparation of Substitute Ocean Water

2.1.3 RTCA Publications

RTCA/DO-160G Environmental Conditions and Test Procedures for Airborne Equipment

2.1.4 ARINC Publications

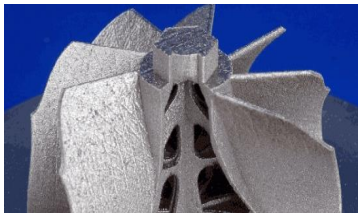
ARINC 677 Installation Standards for Low Frequency Underwater Locator Beacon (LF-ULB)

SAE Aerospace Standards for New Technologies

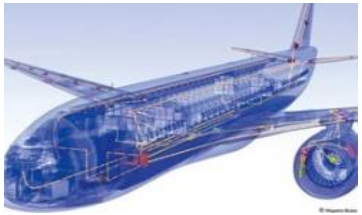
Active RFID Tags

Data Interoperability & Big Data

Cybersecurity



Additive Manufacturing



Electric & More Electric Aircraft

Fiber-optic networks

Integrated Vehicle
Health Management
& Prognostics

New SAE Committees 2014-16

G-22 Engine Supply Chain Quality

G-26 Helicopter Hoists

Electric Aircraft Steering Group (EASG)

AMS-AM Additive Manufacturing

G-27 Lithium Performance Packaging

A-4 HWD – Head Worn Displays

A-4 EFIS – Electronic Flight Information Displays

SAE G-22 Aerospace Engine Supplier Quality (AESQ) Committee

- **Published 4 standards**
  - AS13000 Problem Solving Requirements for Suppliers
  - AS13001 Supplier Self Release Training Requirements
  - AS13002 Requirements for Developing and Qualifying Alternate Inspection Frequency Plans
  - AS13003 Measurement Systems Analysis Requirements for the Aero Engine Supply Chain

- **Drafting 4 new standards**
  - AS13004 FMEA & Process Planning
  - AS13005 Supplier Internal Audit
  - AS13006 Requirements for Process Control for Aero Engine Parts Manufacture
  - AS13007 Supplier Management

AESQ Strategy Group – an SAE ITC Participant Group

SAE Training Developed: *Aerospace Supplier Quality: Common Training for Self-Release Delegates based on AS13001*

- Estimated impact ~4,000 people and growing with a 3-year re-certification cycle

Aerospace Supplier Quality: Common Training for Self-Release Delegates


On-site Delivery


Open Enrollment

I.D.# C1501 Printable Description

Duration: 3 Days

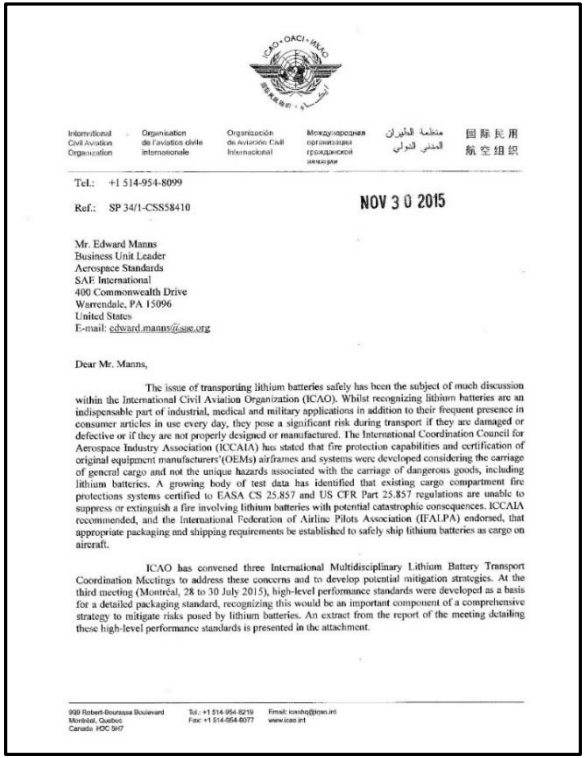
April 5-7, 2016 (8:30 a.m. - 4:30 p.m.) - New Britain, Connecticut	Full Class	- Click to be added to the wait list
April 5-7, 2016 (8:30 a.m. - 4:30 p.m.) - Tysons, Virginia	Full Class	- Click to be added to the wait list
April 12-14, 2016 (8:30 a.m. - 4:30 p.m.) - West Chester, Ohio	Full Class	- Click to be added to the wait list
April 26-28, 2016 (8:30 a.m. - 4:30 p.m.) - Cleveland, Ohio	Full Class	- Click to be added to the wait list
May 3-5, 2016 (8:30 a.m. - 4:30 p.m.) - New Britain, Connecticut	Full Class	- Click to be added to the wait list
May 10-12, 2016 (8:30 a.m. - 4:30 p.m.) - Indianapolis, Indiana	Full Class	- Click to be added to the wait list
May 17-19, 2016 (8:30 a.m. - 4:30 p.m.) - Warrendale, Pennsylvania	Full Class	- Click to be added to the wait list

FAA Tasking Request Status

Document #	Topic	Update
AS6023	Create MPS for active RFID tags and sensors for use on aircraft	Plan to publish August 2016
AS6342	Create MPS for helicopter hoists	Plan to publish March 2017
AS6348	AC to AC conversion standard	Plan to publish April 2017
AS6377	Develop AS and ARP for head-worn displays	Plan to publish January 2018
AS6296	Create MPS for electronic flight instrument system display	Published March 2016
	Develop new additive manufacturing committee	Completed January 2016

ICAO Tasking on Lithium Battery Packaging Standard

- Received SAE's first ICAO tasking request to develop lithium battery packaging performance standard
- Risks associated with the carriage of lithium ion batteries as cargo are not adequately controlled
- Aircraft cargo fire protection systems may not be capable of adequately suppressing a Li battery fire
- ***"ICAO therefore urges SAE to establish a committee to propose a packaging performance standard for lithium batteries using the high-level standards developed during the third multi-disciplinary lithium battery transport coordination meeting as the basis for this work."***



International Civil Aviation Organization | Organisation de l'aviation civile internationale | Organización de Aviación Civil Internacional | Международная организация гражданской авиации | منظمة الطيران المدني الدولي | 国际民用航空组织

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Ref.: SP 34/1-CSS58410

NOV 3 0 2015

Mr. Edward Manns
Business Unit Leader
Aerospace Standards
SAE International
400 Commonwealth Drive
Warrendale, PA 15096
United States
E-mail: edward.manns@sae.org

Dear Mr. Manns,

The issue of transporting lithium batteries safely has been the subject of much discussion within the International Civil Aviation Organization (ICAO). Whilst recognizing lithium batteries are an indispensable part of industrial, medical and military applications in addition to their frequent presence in consumer articles in use every day, they pose a significant risk during transport if they are damaged or defective or if they are not properly designed or manufactured. The International Coordination Council for Aerospace Industry Association (ICCAIA) has stated that fire protection capabilities and certification of original equipment manufacturers'(OEMs) airframes and systems were developed considering the carriage of general cargo and not the unique hazards associated with the carriage of dangerous goods, including lithium batteries. A growing body of test data has identified that existing cargo compartment fire protections systems certified to EASA CS 25.857 and US CFR Part 25.857 regulations are unable to suppress or extinguish a fire involving lithium batteries with potential catastrophic consequences. ICCAIA recommended, and the International Federation of Airline Pilots Association (IFALPA) endorsed, that appropriate packaging and shipping requirements be established to safely ship lithium batteries as cargo on aircraft.

ICAO has convened three International Multidisciplinary Lithium Battery Transport Coordination Meetings to address these concerns and to develop potential mitigation strategies. At the third meeting (Montreal, 28 to 30 July 2015), high-level performance standards were developed as a basis for a detailed packaging standard, recognizing this would be an important component of a comprehensive strategy to mitigate risks posed by lithium batteries. An extract from the report of the meeting detailing these high-level performance standards is presented in the attachment.

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Current AMS-AM Works in Progress (WIPs)

Project	Title	Date
AMS7000	Additive Manufacture of Aerospace parts from Ni-base Superalloy 625 via the Laser Powder Bed Process	Aug 11, 2015
AMS7001	Ni Base 625 Super Alloy Powder for use in Laser Powder Bed Add Mfg Machines	Oct 05, 2015
AMS7002	Process Requirements for Production of Ni-base 625 for Production of Aerospace parts via Laser Powder Bed Additive Manufacturing	Oct 28, 2015
AMS7003	Laser Powder Bed Fusion Process	Oct 28, 2015

Next topics – Metallic: Titanium AM (Airbus),
Non-metallic: Cabin Parts (IATA)

SAE Standards and Products

2016

- **Farnborough International Airshow, July 12th 2016 Operators/MRO Maintenance Credits Workshop**
- **Keynote – Ian Davies, EasyJet**
- **Airline focus**

SAE 2015
INTEGRATED VEHICLE HEALTH MANAGEMENT WORKSHOP

Along with the rapidly evolving field of civil airline services, Integrated Vehicle Health Management (IVHM) technologies (such as sensors and algorithms), are enabling improved diagnostic capabilities and the potential for a step change in aircraft and fleet maintenance and operations based on prognostics that reliably predict remaining life of key assets such as aircraft components (e.g. actuators) and sub-systems (e.g. landing gear). Achieving Maintenance Credits for this will require close co-operation between industry stakeholders such as platform integrators, regulators, airlines and MRO&L providers.

The event will feature a series of speakers addressing the IVHM future state and the process towards obtaining Maintenance Credits from OEMs, Operators and Regulators and will center around 3 interactive workshops to support and advance industry and stakeholder collaboration through:

- Engagement with the Regulators
- The Maintenance Credits Process
- Data Interoperability

SAE International continues to be at the forefront in providing the most comprehensive review of current issues affecting the advancement of integrated vehicle health management to today's engineers.

Who Should Attend
Aerospace Operations
Aircraft Systems
Avionics
Business/Economics
Integrated Vehicle Health Management
Materials/Structures
Maintenance, Repair, and Overhaul
Power Systems
Propulsion
Quality Control
Safety
Systems Engineering
Unmanned Aerial Systems

EVENT AGENDA

0913 - 1000	Coffee / Tea
(1000 – 1025)	Opening and Welcome Workshop leaders welcome participants and report out from the October 2014 meeting. *Dr. Richard Greene , SAE President* *Martin Broadhurst, CBE, Rhea's President* *David Alexander, SAE International* *Jim Angus, Cranfield University* *Brian Allen, GlobeIQ*
(1025 – 1110)	Future State Presentations: Operating and Maintaining a Fleet with IVHM Capability Operators, Fleet owners, and maintainers provide their perspectives on the benefits and considerations of operating a fleet with IVHM capability. *Dr. Steve Heath, Etihad* *Helicopter Operator/OEM – TBC* *Chief Executive Lufthansa Technik*
(1110 - 1115)	Coffee / Tea Break
(1115 – 1220)	Working with the Regulator Workshop This session will discuss the current regulatory and maintenance practice landscape and identify actions needed for the certification and operation of IVHM systems. *David Alexander, Jim Angus* *Alastair Hawley, EASA*
(1220 -1315)	Buffet Lunch & Networking Break
(1315 – 1415)	Maintenance Credits Workshop This session will look at the process towards obtaining credits for using IVHM systems and capabilities for maintenance tasks. *Gene Iverson, Boeing* *Richard Friend, Rolls-Royce*
1415 – 1420	Short Break
(1420 – 1525)	Data Interoperability Workshop This session will discuss the need for data interoperability in helping to build empirical evidence to support maintenance credits. *Charlie Dibsdale*
(1525 - 1535)	Coffee / Tea Break
(1535 – 1600)	Conclusions and Closing This panel will review the conclusions from the workshop discussions and lay out the next steps for each theme. *Dr. Richard Greene*
1600 -1700	Reception (pending sponsorship)

FOR COMPLETE EVENT INFORMATION:
Online: www.sae.org/events/ivhm

REGISTRATION:
Online: www.sae.org/events/ivhm/attend/registration/

For assistance with registration, please contact:
SAE Customer Service
Telephone: 1-877-606-7323 (USA and Canada) Or 1-724-776-4970 (outside of USA and Canada)
Fax: 1-724-776-0790
E-mail: CustomerService@sae.org

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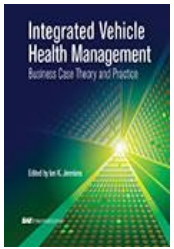
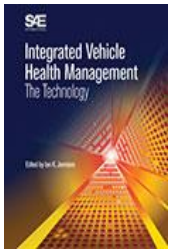
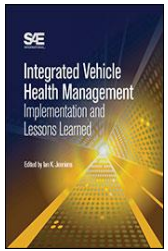
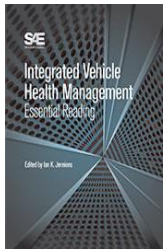
IVHM Book Series









SSTC Standards

Acquired from TechAmerica Group in 2013

Formerly EIA, GEIA standards

Fully Integrated into SAE Aerospace Standards program as SSTC Systems Group

Includes IBIS consortium, which resides in SAE ITC

- 137 Standards; 22 Works in Progress
- Addressing multiple industry sectors
- Avionics, Configuration Management, Systems Engineering, Safety, Lifecycle Logistics, Reliability
- Potential establishment of new cross-sector Council
- New Human Systems Integration standards project under G-45

Engine & Airframe Standards

Acquired from ADS in 2015; history as SBAC standards from 1916

Operates under SAE ITC and includes associated parts qualification programme

- Rebranded as *SAE ITC Engine & Airframe Standards*
- New Website capabilities
- UK-based Technical Standards Committee (TSC) oversight
- New airframe fastener standard in development by Rolls-Royce and Airbus
- Increase in foreign qualifications since SAE acquisition – India, China, Taiwan, USA
- Links made with SAE E-25 and G-3 committees for synergy

Summary

The role standards play in industry and regulation is critical

Industry needs a transparent, robust and efficient process for producing standards

Aerospace industry standardisation is consolidating as organisations focus on core values and services – driving efficiency and connecting global industry

Global industry and regulation plays a leading role in SAE standards – at strategic and technical levels

SAE's global offices directly support constituents – Europe, Asia and Americas

SAE's aerospace standards portfolio available online includes SAE International Standards, Engine & Airframe Standards and associated standards products

QUESTIONS?

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BACKUP:

EXISTING SAE STANDARDS FOR RPAS

SAE INTERNATIONAL GLOBAL STANDARDS

The following SAE standards either explicitly state provisions for unmanned systems or are written entirely for unmanned systems.

Document	Title
AS50881™	Wiring Aerospace Vehicle
ARP94910™	Aerospace - Vehicle Management Systems - Flight Control Design, Installation and Test of, Military Unmanned Aircraft, Specification Guide For
ARP5724™	Aerospace - Testing of Electromechanical Actuators, General Guidelines For
ARP5707™	Pilot Training Recommendations for Unmanned Aircraft Systems (UAS) Civil Operations
AIR6027™	Considerations for Safe Store Operation on Manned and Unmanned Vehicles
AIR744™	Aerospace Auxiliary Power Sources

SAE TECHNICAL COMMITTEE: AS-4 UNMANNED SYSTEMS

The primary goal of AS-4 is to publish standards that enable interoperability of unmanned systems for military, civil and commercial use through the use of open systems standards and architecture development.

Subcommittees include:

- AS-4ALFUS Unmanned Systems Performance Measures Committee
- AS-4JAUS Joint Architecture for Unmanned Systems Committee
- AS-4UCS Unmanned Aircraft System Control Segment Committee

AS-4JAUS (Joint Architecture for Unmanned Systems Committee)

AS-4 was formed as a result of the Joint Architecture for Unmanned Systems Working Group (JAUS WG) migration to SAE.

The objective is to define and sustain a joint architecture for the domain of unmanned systems. JAUS is a message-based architecture that defines data formats and methods of communication among computing nodes.

For example:

All modular components/subsystems, if designed to the JAUS standards, will communicate with the system regardless of manufacturer.

TABLE OF SAE JAUS DOCUMENTS

SAE Document	Title
ARP6128	Unmanned Systems Terminology Based on the ALFUS Framework
AIR5645A	JAUS Transport Considerations
AIR5664A	JAUS History and Domain Model
AIR5665B	Architecture Framework for Unmanned Systems
ARP6012A	JAUS Compliance and Interoperability Policy
ARP6227	JAUS Messaging over the OMG Data Distribution Service (DDS)
AS5669A	JAUS/SDP Transport Specification
AS5684B	JAUS Service Interface Definition Language
AS5710A	JAUS Core Service Set
AS6009	JAUS Mobility Service Set
AS6040	JAUS HMI Service Set
AS6057A	JAUS Manipulator Service Set
AS6060	JAUS Environment Sensing Service Set
AS6062	JAUS Mission Spooling Service Set
AS6091	JAUS Unmanned Ground Vehicle Service Set

AS-4ALFUS (Unmanned Systems Performance Measures Committee)

The addition of the Performance Measures subcommittee, previously the Autonomy Levels for Unmanned Systems (ALFUS) Working Group, adds a critical dimension to unmanned systems standards

The AS-4ALFUS committee specifies terms and definitions for the performance of unmanned systems; establish measures for the performance and characterization of unmanned systems, their components, and their interactions

AS-4UCS (Unmanned Control Segment)

The AS-4UCS Technical Committee supports the charter of AS-4 (Unmanned Systems) in the field of the Unmanned Aircraft System (UAS) Control Segment (UCS). The UCS is defined as the system or family of systems that controls and monitors one or more unmanned aircraft and their payloads, where an unmanned aircraft is defined as an aerial vehicle that does not convey its pilot or operator, and a payload is defined as a device carried by the unmanned aircraft to support its assigned mission

- The scope of the AS-4UCS Technical Committee is to define UCS architectures and architecture frameworks, develop associated Technical Reports to support the ecosystem of UCS products, and support alignment of UCS architectures with peer architectures.

TABLE OF SAE UCS AND ALFUS DOCUMENTS

SAE Document	Title
AIR6514	*UAS Control Segment (UCS) Architecture: Interface Control Document (ICD)*
AIR6515	*UAS Control Segment (UCS) Architecture: EA Version of UCS ICD Model*
AIR6516	*UAS Control Segment (UCS) Architecture: RSA Version of UCS ICD Model*
AIR6517	*UAS Control Segment (UCS) Architecture: Rhapsody Version of UCS ICD Model*
AIR6519	*UAS Control Segment (UCS) Architecture: Use Case Trace (UCTRACE)*
AIR6520	*UAS Control Segment (UCS) Architecture: Version Description Document (VDD)*
AIR6521	*UAS Control Segment (UCS) Architecture: Data Distribution Service (DDS)*
AIR6523	*Data Dictionary for Quantities Used in Unmanned Systems*
AS6512	*UAS Control Segment (UCS) Architecture: Architecture Description*
AS6513	*UAS Control Segment (UCS) Architecture: Conformance Specification*
AS6518	*UAS Control Segment (UCS) Architecture: Model*
AS6522	*UAS Control Segment (UCS) Architecture: Architecture Technical Governance*
ARP6128	Unmanned Systems Terminology Based on the ALFUS Framework

SAE PRODUCT ASSURANCE

ARP-4754A: Guidelines for Development of Civil Aircraft and Systems

This document discusses the development of aircraft systems taking into account the overall aircraft operating environment and functions

This includes validation of requirements and verification of the design implementation for certification and product assurance. It provides practices for showing compliance with the regulations and serves to assist a company in developing and meeting its own internal standards by considering the guidelines herein