SAE Aerospace Standards

Aerospace Standards Workshop
CII/ANSI SCCP
Habitat Centre
New Delhi, India
February 18, 2010

SAE Aerospace
An SAE International Group

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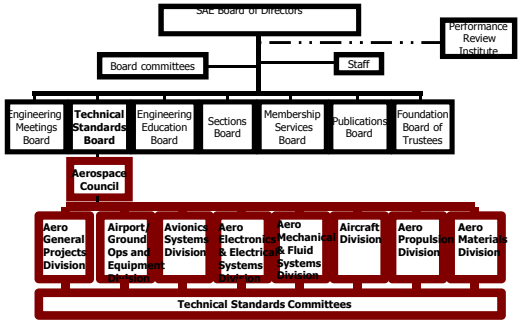

2. Organisational Structure

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About SAE: Purpose

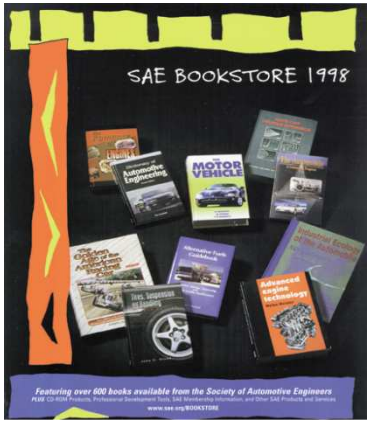
SAE's main purpose is to collect, develop, and disseminate technical information related to mobility technology.

About SAE …

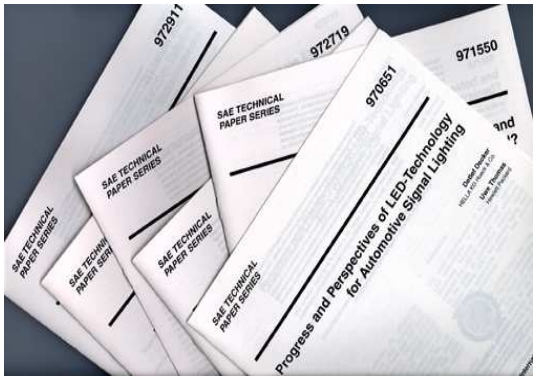
- Non-profit technical organisation
- U.S. IRS code 501C3
- Not a trade association, does not lobby
- 250 professional staff in Warrendale PA, Troy Michigan, Washington DC, and London, UK.

About SAE: Publications

Magazines/Newsletters



Books



Technical Paper Series

Standards

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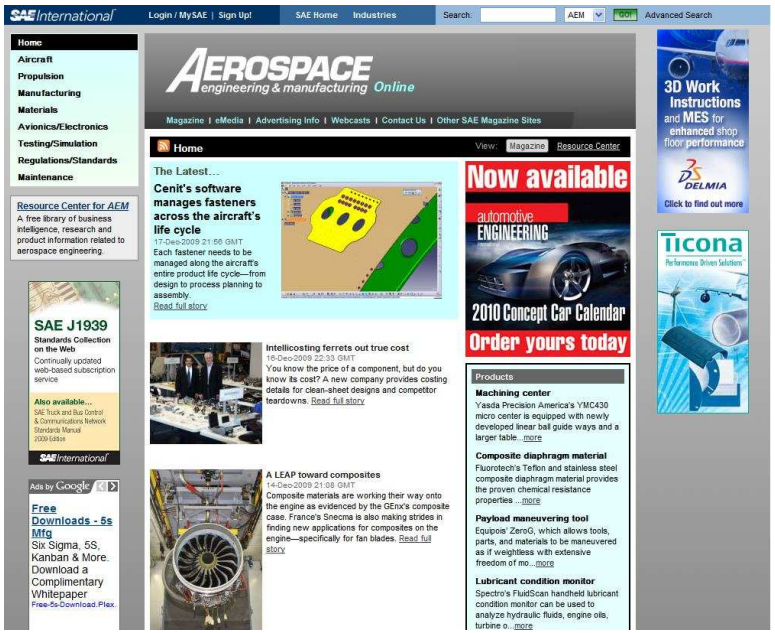
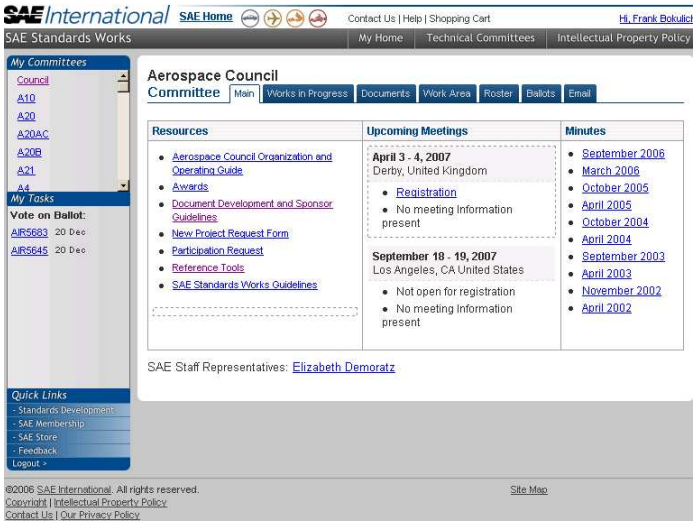
SAE Online

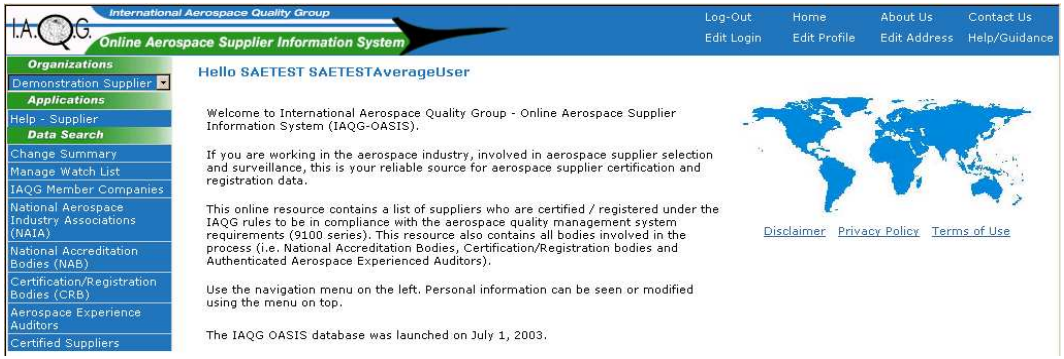
SAE Homepage



Aerospace Engineering Online



SAE Standards Works



IAQG OASIS Database

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About SAE: Life Long Learning

A World In Motion (K-12)

Collegiate Design Competitions

Scholarships

Conferences and Symposia

Faculty Programs

Professional Development Courses

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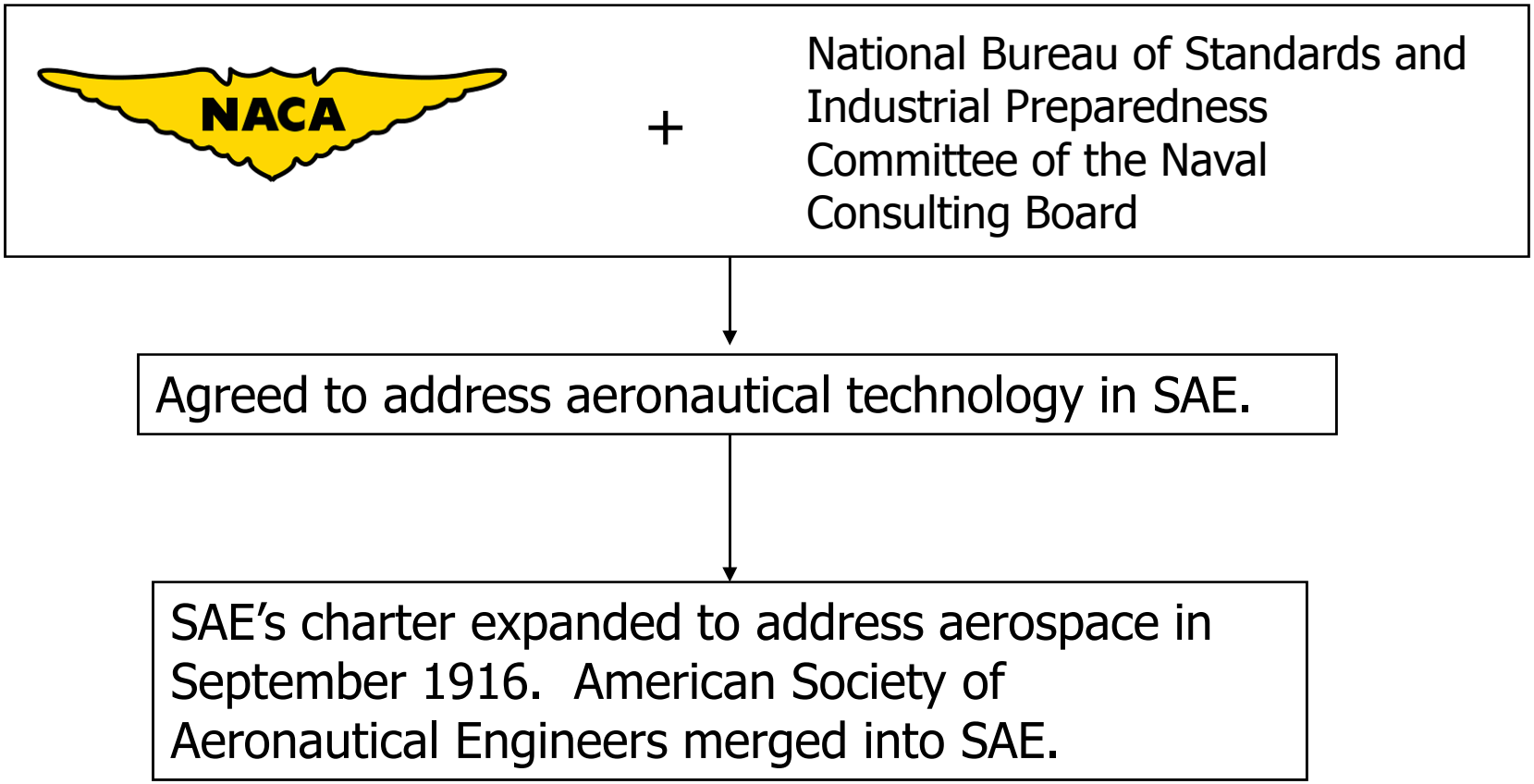
About SAE in Aerospace:
A Historical Perspective 1916

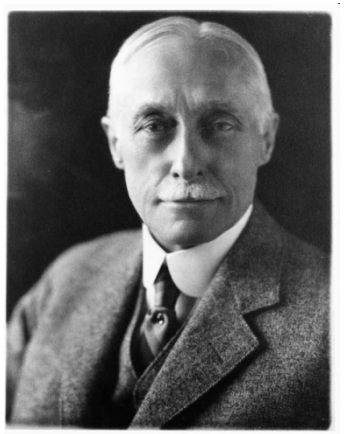


Over the years, many aviation pioneers became active SAE Members.

Orville Wright

Glenn Curtiss

Glenn Martin



Elmer Sperry

Chance Vought

Jimmy Doolittle

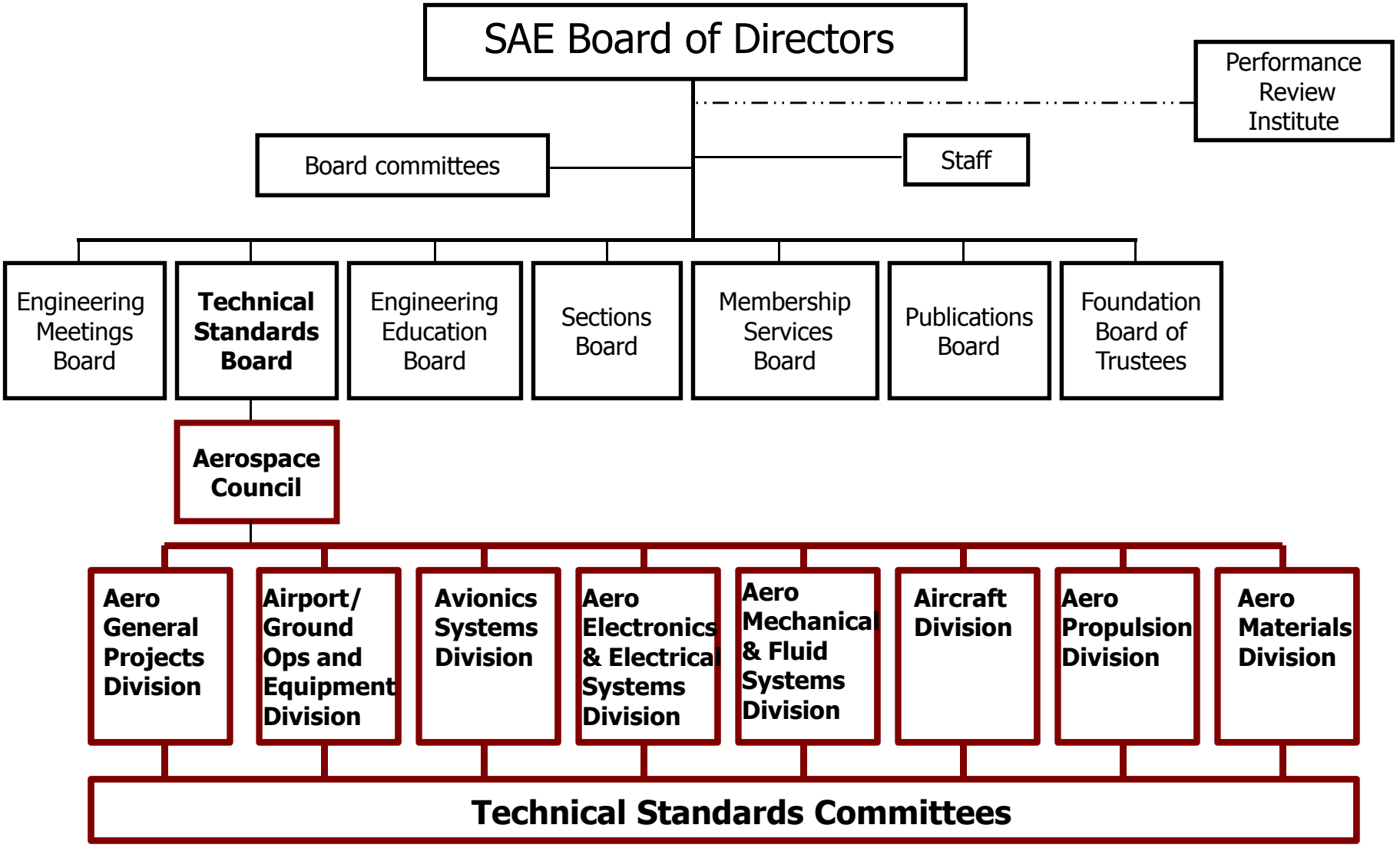
Charles Lindbergh

Amelia Earhart

Kelly Johnson

Igor Sikorsky

SAE organisation Structure



The above is a graphical display of SAE's primary organisational structure. There are many other committees within SAE that are not depicted in this chart.

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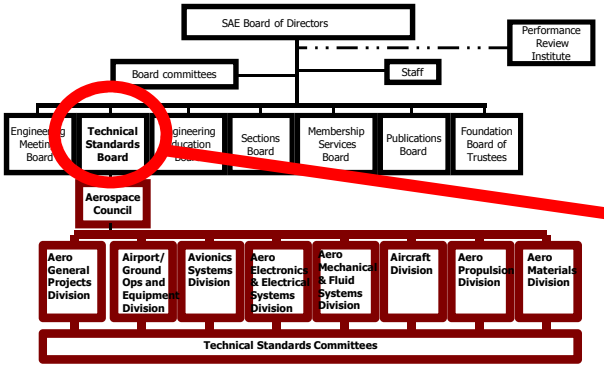
SAE organisation Structure: Operating Board Level



Technical Standards Board

- **Aerospace Council**
- **Construction, Agricultural, & Off-road Council**
- **Motor Vehicle Council**
- **Truck & Bus Council**
- **Fuels & Lubricants Council**
- **Materials, Parts, & Processes Council**
- **Specialized Vehicle & Equipment Council**

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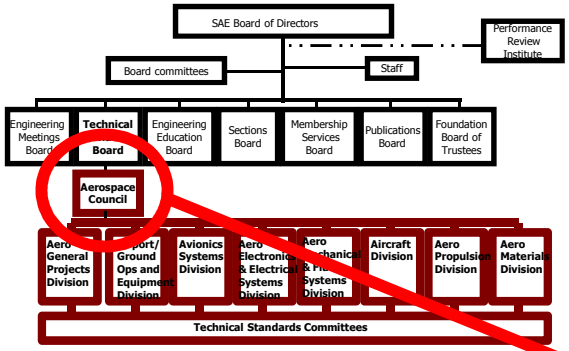
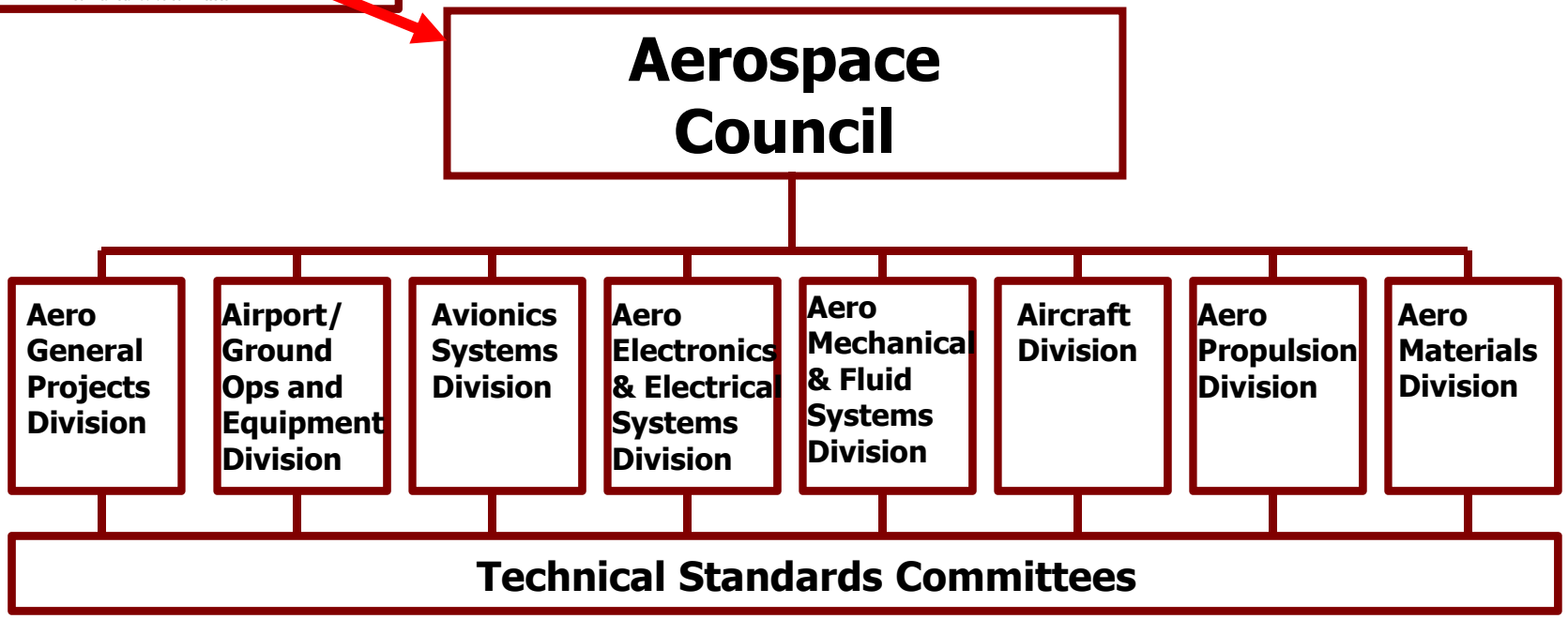
SAE organisation Structure: Council Level





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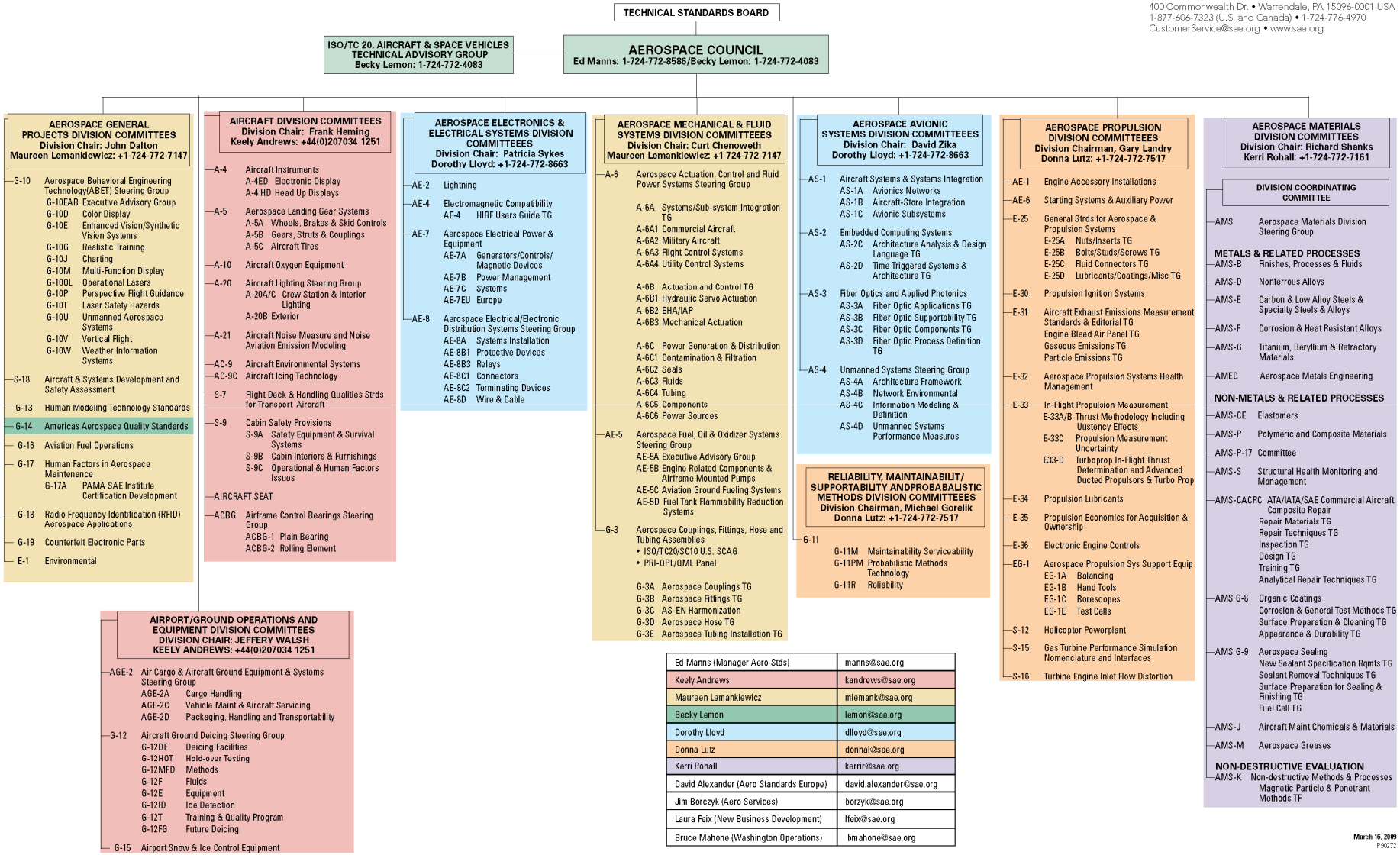
The Aerospace Council is chaired by Laura Hitchcock, Sr Standards Specialist, The Boeing Company. Organisations represented on the Aerospace Council include:

- Airbus
- Boeing
- Bombardier
- CAPE/CARIS
- CIRA
- Delta Airlines
- European Aviation Safety Agency
- Embraer
- Federal Aviation Administration
- Fed Ex
- GE Company
- General Dynamics
- Goodrich
- Global Ground Support
- Honeywell Aerospace
- Lockheed Martin
- NASA Marshall
- Naval Air Systems Command
- Northrop Grumman
- Pratt & Whitney
- Rolls-Royce
- Sikorsky Aircraft
- SGS
- Transport Canada
- United Airlines
- US Airways
- U.S. Department of Defense

SAE Aerospace Council Organization Chart

SAE International
Customer Service
400 Commonwealth Dr. • Warrendale, PA 15096-0001 USA
1-877-606-7323 (U.S. and Canada) • 1-724-776-4970
CustomerService@sae.org • www.sae.org



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Bruce Mahone (Washington Operations)	bmahone@sae.org

March 16, 2009
P90272

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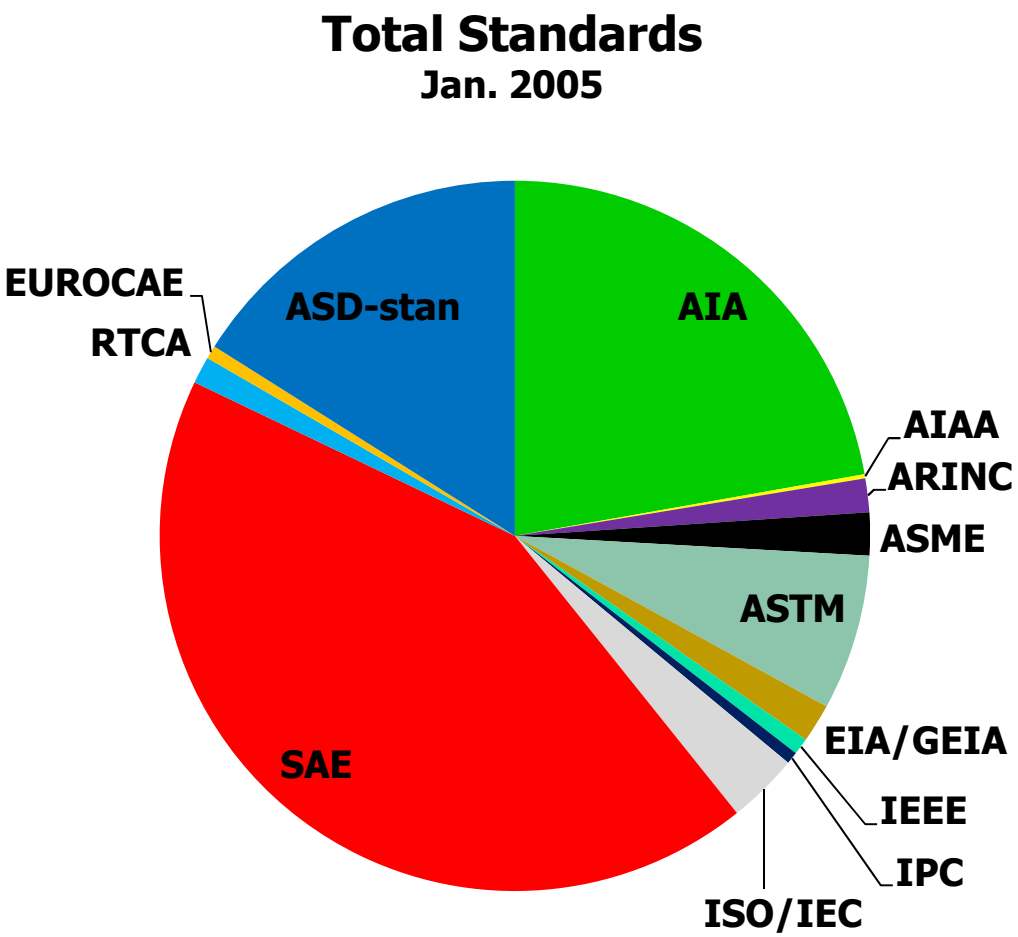
SAE's Aerospace Standards Program is the largest in the world.



6800+ standards

150+ committees, subcommittees, and task groups

8000+ participants

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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

More than 75 topics

Types of Documents

- **AS – Aerospace Standard**
- **AMS – Aerospace Material Specification**
- **ARP – Aerospace Recommended Practice**
- **AIR – Aerospace Information Report**

SAE provides a neutral forum for developing consensus documents.

Consensus is considered when 50% of voting membership responds and 75% of responses are Approvals with effort to resolve comments and Disapprovals. All balloting takes place electronically via the SAE Website.

Committee meetings are open to all interested parties, but only committee members vote on draft documents. Individuals participate on committees as technical experts and not as representatives of their organisations.

All SAE documents are reviewed every five years

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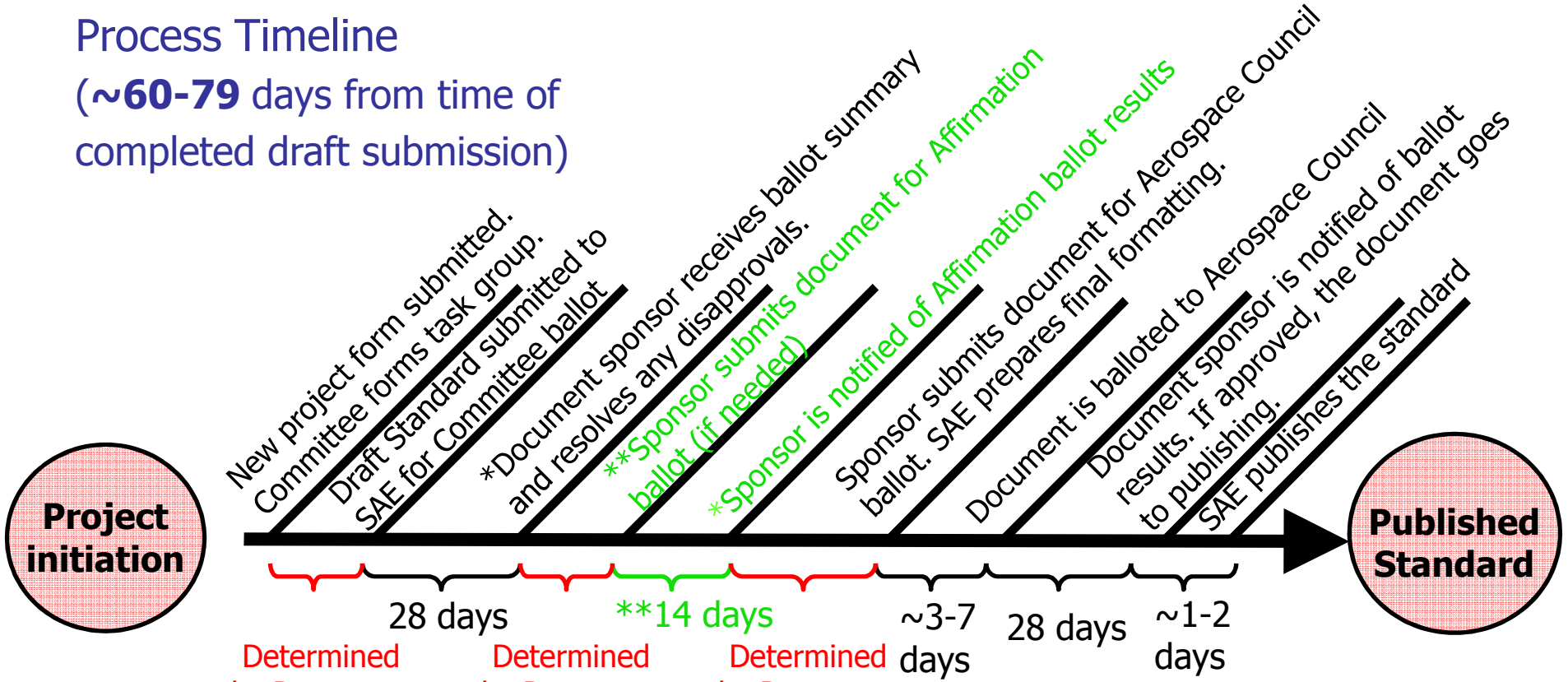
SAE has a proven consensus process for the development of aerospace standards.

Process Timeline
(**~60-79** days from time of completed draft submission)



* Additional ballots may be needed depending on the changes made.

**Affirmation ballot not required if document was approved with no technical changes.

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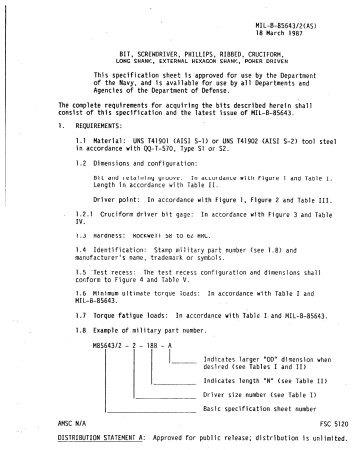
Essentially, the document sponsor and Technical Committee are the key factors in how quickly a standard is developed and published.

SAE Aerospace standards have been developed as quickly as **29** days.

On average, it takes about 12 months to develop an SAE Aerospace standard—from concept to publication.

SAE partners with international Aerospace/Standards Organisations.

Partnering: Over 1500 Mil-Specs were converted to SAE standards.



MIL-B-85643/2(AS)
18 March 1987

BIT, SCREWDRIVER, PHILLIPS, RIBBED, CRUCIFORM, LONG SHANK, EXTERNAL HEXAGON SHANK, POWER DRIVEN

This specification sheet is approved for use by the Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

The complete requirements for acquiring the bits described herein shall consist of this specification and the latest issue of MIL-B-85643.

1. REQUIREMENTS:

1.1 Material: UNS T41901 (AISI S-1) or UNS T41902 (AISI S-2) tool steel in accordance with QQ-T-570, Type S1 or S2.

1.2 Dimensions and configuration:

Bit end retaining groove: In accordance with Figure 1 and Table I. Length in accordance with Table II.

Driver point: In accordance with Figure 1, Figure 2 and Table III.

1.2.1 Cruciform driver bit gage: In accordance with Figure 3 and Table IV.

1.3 Hardness: Rockwell 56 to 62 HRC.

1.4 Identification: Stamp military part number (see 1.8) and manufacturer's name, trademark or symbols.

1.5 Test recess: The test recess configuration and dimensions shall conform to Figure 4 and Table V.

1.6 Minimum ultimate torque loads: In accordance with Table I and MIL-B-85643.

1.7 Torque fatigue loads: In accordance with Table I and MIL-B-85643.

1.8 Example of military part number.

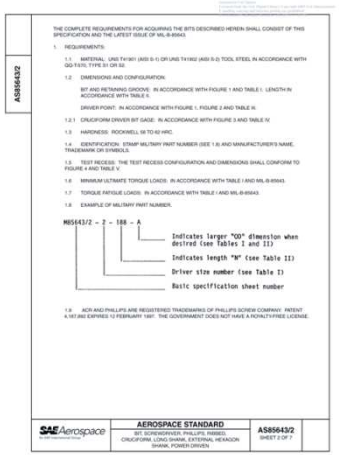
M85643/2 - 2 - 188 - A

- A — Indicates larger "OD" dimension when desired (see Tables I and II)
- 188 — Indicates length "M" (see Table II)
- 2 — Driver size number (see Table I)
- /2 — Basic specification sheet number

AMSC N/A FSC 5120

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

Page 1 of 7



AS85643/2

THE COMPLETE REQUIREMENTS FOR ACQUIRING THE BITS DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION AND THE LATEST ISSUE OF MIL-B-85643.

1. REQUIREMENTS:

1.1 MATERIAL: UNS T41901 (AISI S-1) OR UNS T41902 (AISI S-2) TOOL STEEL IN ACCORDANCE WITH QQ-T-570, TYPE S1 OR S2.

1.2 DIMENSIONS AND CONFIGURATION:

BIT AND RETAINING GROOVE: IN ACCORDANCE WITH FIGURE 1 AND TABLE I. LENGTH IN ACCORDANCE WITH TABLE II.

DRIVER POINT: IN ACCORDANCE WITH FIGURE 1, FIGURE 2 AND TABLE III.

1.2.1 CRUCIFORM DRIVER BIT GAGE: IN ACCORDANCE WITH FIGURE 3 AND TABLE IV.

1.3 HARDNESS: ROCKWELL 56 TO 62 HRC.

1.4 IDENTIFICATION: STAMP MILITARY PART NUMBER (SEE 1.8) AND MANUFACTURER'S NAME, TRADEMARK OR SYMBOLS.

1.5 TEST RECESS: THE TEST RECESS CONFIGURATION AND DIMENSIONS SHALL CONFORM TO FIGURE 4 AND TABLE V.

1.6 MINIMUM ULTIMATE TORQUE LOADS: IN ACCORDANCE WITH TABLE I AND MIL-B-85643.

1.7 TORQUE FATIGUE LOADS: IN ACCORDANCE WITH TABLE I AND MIL-B-85643.

1.8 EXAMPLE OF MILITARY PART NUMBER.

M85643/2 - 2 - 188 - A

- A — Indicates larger "OD" dimension when desired (see Tables I and II)
- 188 — Indicates length "M" (see Table II)
- 2 — Driver size number (see Table I)
- /2 — Basic specification sheet number

1.9 ACR AND PHILLIPS ARE REGISTERED TRADEMARKS OF PHILLIPS SCREW COMPANY. PATENT 4,187,892 EXPIRES 12 FEBRUARY 1997. THE GOVERNMENT DOES NOT HAVE A ROYALTY-FREE LICENSE.

SAE Aerospace | AEROSPACE STANDARD | AS85643/2 SHEET 2 OF 7

- The US DOD adopted more SAE documents than any other SDO documents.
- http://www.sae.org/standardsdev/military/

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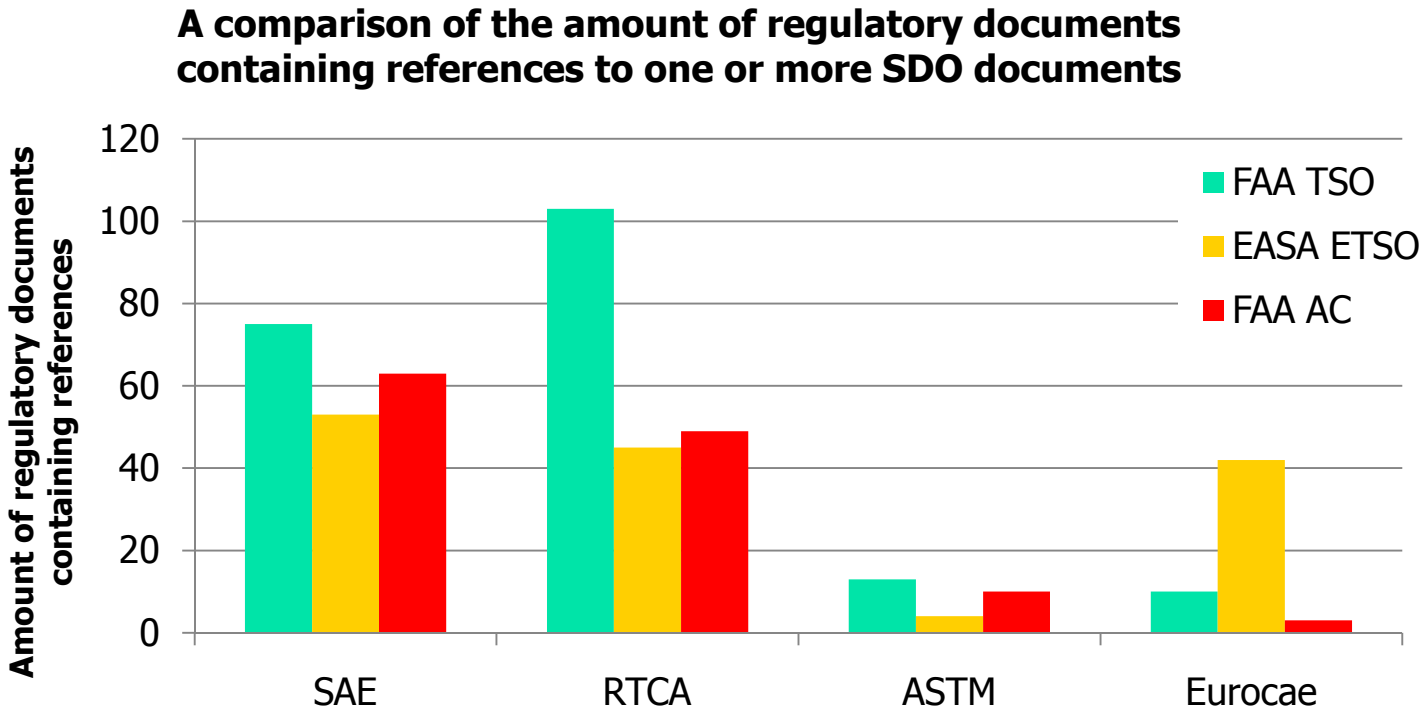
Partnering: SAE documents are referenced in domestic and international regulations.



- The FAA participates on about 90% of the SAE Aerospace Standards Committees.

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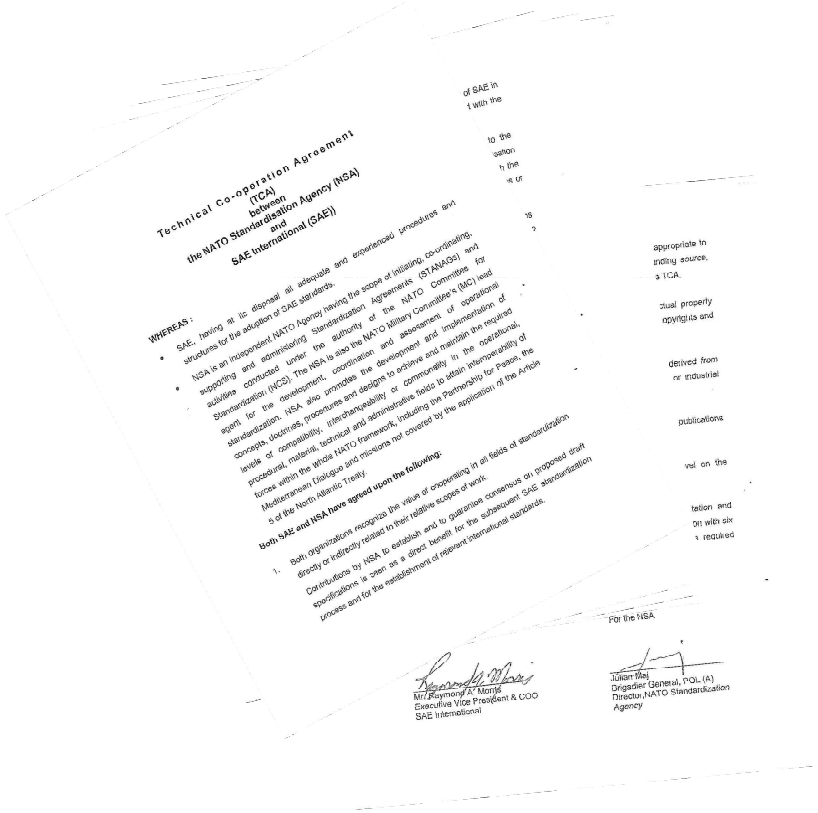
Partnering: SAE, ASTM, and ANSI signed an MoU with NATO (March 2005) at the Defense Standardization Program Conference in Washington DC.



Technical Co-operation Agreement
(TCA)
between
the NATO Standardization Agency (NSA)
and
SAE International (SAE)

WHEREAS:

- SAE, having at its disposal all adequate and experienced procedures and structures for the adoption of SAE standards,
- NSA is an independent NATO Agency having the scope of initiating, co-ordinating, supporting and administering Standardization Agreements (STANAGS) and publications conducted under the authority of the NATO Military Committee's (MC) lead Standardization (NCS). The NSA is also the NATO Military Committee's (MC) lead agent for the development, coordination and assessment of operational standardization. NSA also promotes the development and implementation of concepts, documents, procedures and designs to achieve and maintain the required levels of compatibility, interchangeability or commonality in the operational, procedural, material, technical and administrative fields to attain interoperability of forces within the whole NATO framework, including the Partnership for Peace, the Mediterranean Dialogue and missions not covered by the application of the Article 5 of the North Atlantic Treaty.

both SAE and NSA have agreed upon the following:

1. Both organizations recognize the value of cooperating in all fields of standardization directly or indirectly related to their relative scopes of work.
2. Contributions by NSA to establish and to guarantee consensus on proposed draft standardizations is seen as a direct benefit for the subsequent SAE standardization process and for the establishment of relevant international standards.

For the NSA

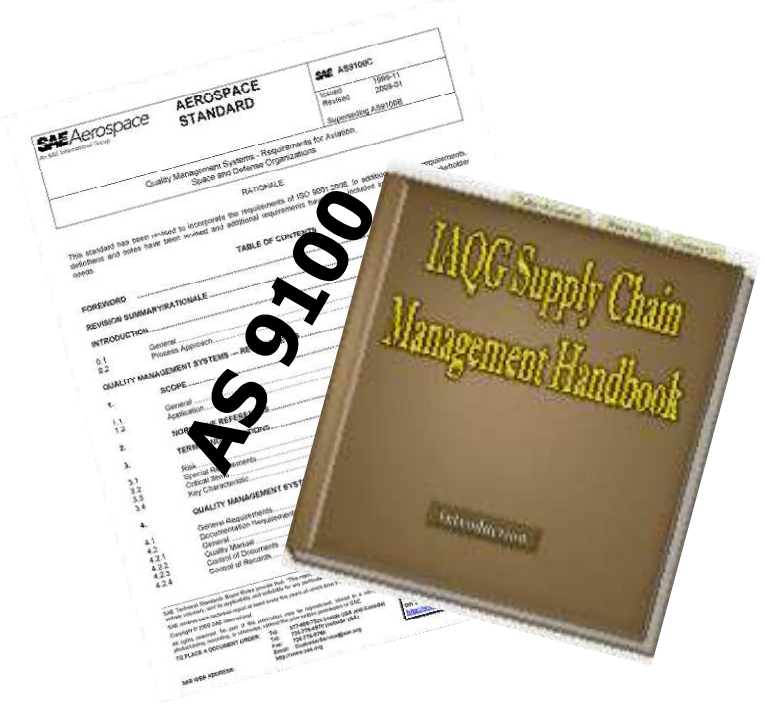
Julian Mej
Brigadier General, POL (A)
Director, NATO Standardization Agency

Mr. Raymond A. Morris
Executive Vice President & COO
SAE International

NATO shall support and adopt SAE industry standards when appropriate.

Partnering: SAE harmonizes international quality standards via IAQG.

- International Aerospace Quality Group (IAQG)
  - SAE represents North and South America via the Americas Aerospace Quality Group (SAE Committee G-14)
  - ASD represents Europe
  - SJAC represents Asia



For more information, visit www.iaqg.org

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3 organizations represent AIQG. SAE represents North and South America, ASD represents Europe, and SJAC represents Asia.

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Created in 1990 by SAE, PRI is a not-for-profit organisation that provides the mobility industry with international, unbiased manufacturing process and product quality assessments and certification services.

programs include:

- Nadcap: An industry-managed, consensus approach to OEM oversight of special process and product suppliers. Nadcap is an integral part of the supplier management system of most of the world's aerospace prime manufacturers.
- PRI Registrar: An approved Registrar accredited to certify organisations to a variety of management systems including ISO 9000, AS9100, and ISO 14000.

For more information, visit
www.pri-network.org

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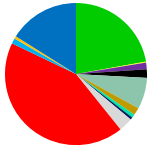
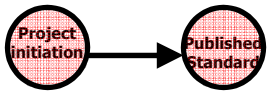
Utilizing SAE



SAE has a proven track record, with more than 6800 standards published to date.

SAE's standards are recognized internationally on their own merits.

SAE has high-level support from a variety of key aerospace companies, organisations, and government agencies.



SAE has a proven consensus process for the development of aerospace standards.

SAE Technical Committees contain a wealth of industry experience and expertise for a variety of aerospace systems, components, and materials.

Discussion Topics

- Who develops standards, regulations, and conformity assessment requirements for aerospace in India?
- What are the key issues or hot topics related to standards and conformance for aerospace?
- What challenges does the aerospace industry face?
- How can the U.S. and India further cooperate in the area of aerospace standards and conformance?

Thank you for your time and attention!

Are there any questions?

Bruce Mahone
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