



**SAE**International™



# **SAE International Standards- AS5553 and AS5553A Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition**

17<sup>th</sup> April, 2013

Component Obsolescence Group, COG

Training Workshop

SAE Aerospace Standards Europe

SAE International

[www.sae.org](http://www.sae.org)



# SAE International...

- Global Offices:
  - World Headquarters – Warrendale PA, USA
  - Automotive Headquarters – Troy MI, USA
  - Aerospace Standards Office – Washington DC
  - SAE International China Office – Shanghai
  - **Aerospace Standards Europe Office – London**
- Established in 2007
- Focus on European operations for SAE Aerospace Standards program
- Liaison with European industry and government
- New Standards Development

## UK Staff

- Senior Coordinator
- Standards Engineer
- Aerospace Standards Specialist





# Key SAE Standards Activities



**Materials**

**Environmental Standards**



**Counterfeit Parts Avoidance**

**Standard Parts**



**Deicing**

**Human Factors**



**Military Avionics**

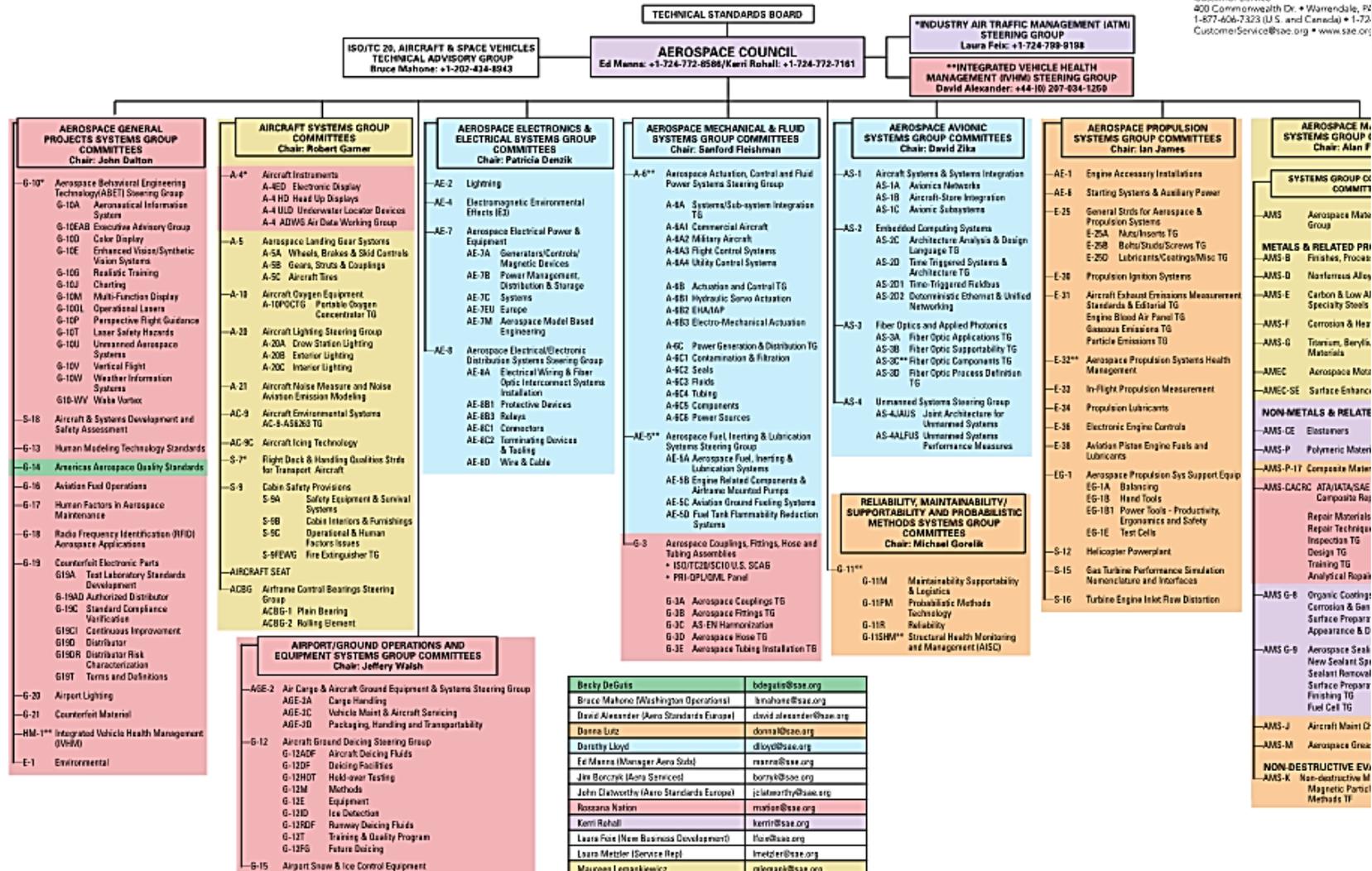
**Integrated Vehicle Health Management (IVHM) & Reliability**





## SAE Aerospace Council Organization Chart

Customer Service  
620 Commonwealth Dr. • Warrendale, PA  
1-877-466-7323 (U.S. and Canada) • 1-724  
CustomerService@sae.org • www.sae.org





# **SAE Aerospace G-19 Counterfeit Electronic Parts Committee**

- Chartered in 2007 to address aspects of preventing, detecting, responding to and counteracting the threat of counterfeit electronic components. Participants included:
  - Government
  - Defense/Aerospace Manufacturers
  - Industry Groups
  - Testing Laboratories
- April 2009 - SAE International released aerospace standard AS5553, Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition
- August 2009 – United States Department of Defense adopted AS5553



# SAE G-19 Members

## from Government, Defense and Industry Sectors

### Government and Defence Members ...

- Defense Logistics Agency (DLA)
- Defense Contract Management Agency (DCMA)
- DOE - National Nuclear Security Administration (NNSA)
- Federal Aviation Administration (FAA)
- Intelligence Advanced Research Projects Activity (IARPA)
- [Ministry of Defence \(MoD\), UK](#)
- National Aeronautics and Space Administration (NASA)
- USAF/NRO (National Reconnaissance Office)
- USAF Wright Patterson Air Force Base (AFB)
- US Army - AMCCC Business Operations HQAMC
- US Army Aviation & Missile Command
- US Army Redstone Arsenal
- US Missile Defense Agency (MDA)
- US Navy - Naval Air Warfare Center
- US Navy - Naval Surface Warfare Center (NSWC )Crane
- US Navy - NAVSEA Crane
- US Navy, Submarine Maintenance Engineering, Planning and Procurement (SUBMEPP) Activity
- US Department of Transportation

**Note: Members function as individuals intending to represent the best interests of the industry, and not as agents or representatives of any organization with which they may be associated**



## **SAE G-19 Members From Industry Sectors**

### **Participating Industry Associations ...**

- ACLASS Accreditation Services
- Aerospace Industries Association (AIA)
- ANSI-ASQ Accreditation Board (ANAB)
- **Component Obsolescence Group (COG)**
- The Electronic Components Supply Network
- EIA Standards and Technology Electronic Components
- ERAI, Inc.
- Independent Distributors of Electronics Association (IDEA)
- Performance Review Institute (PRI)
- **UK Electronics Alliance (UKEA)**



## SAE G-19 Industry Members

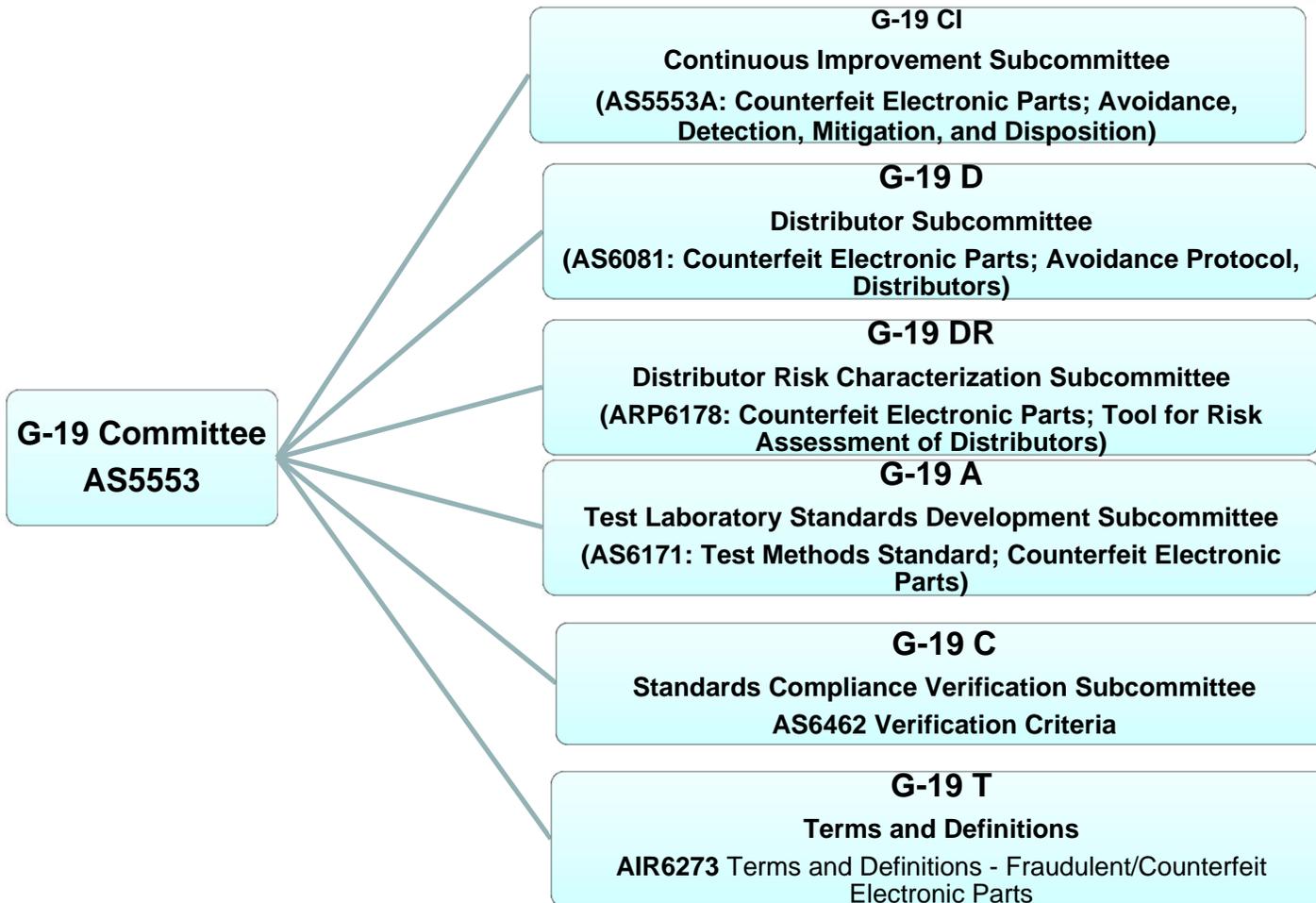
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Aero Engine Controls  
American Electronic Resource  
Analytical Alternatives  
Analytical Solutions  
Applied DNA Sciences  
Arcadia Components  
Ares Corp  
Arrow Electronics  
Astute Electronics  
BAE Systems (Operations)  
BAE Systems  
Ball Aerospace & Technologies  
Boeing  
Boeing Advanced Systems  
Business Quality Process Management  
Bechtel Plant Machinery  
CALCE University Of Maryland  
Celestica Corp. Technology & Engineering  
China Aero-Polytechnology Establishment  
Crestwood Technology Group  
DA-Tech  
Derf Electronics  
Det NortskeVeritas (DNV)  
DPA Components International  
Electronic Supply Chain Solutions  
Eltek Semiconductors  
General Dynamics  
General Dynamics UK

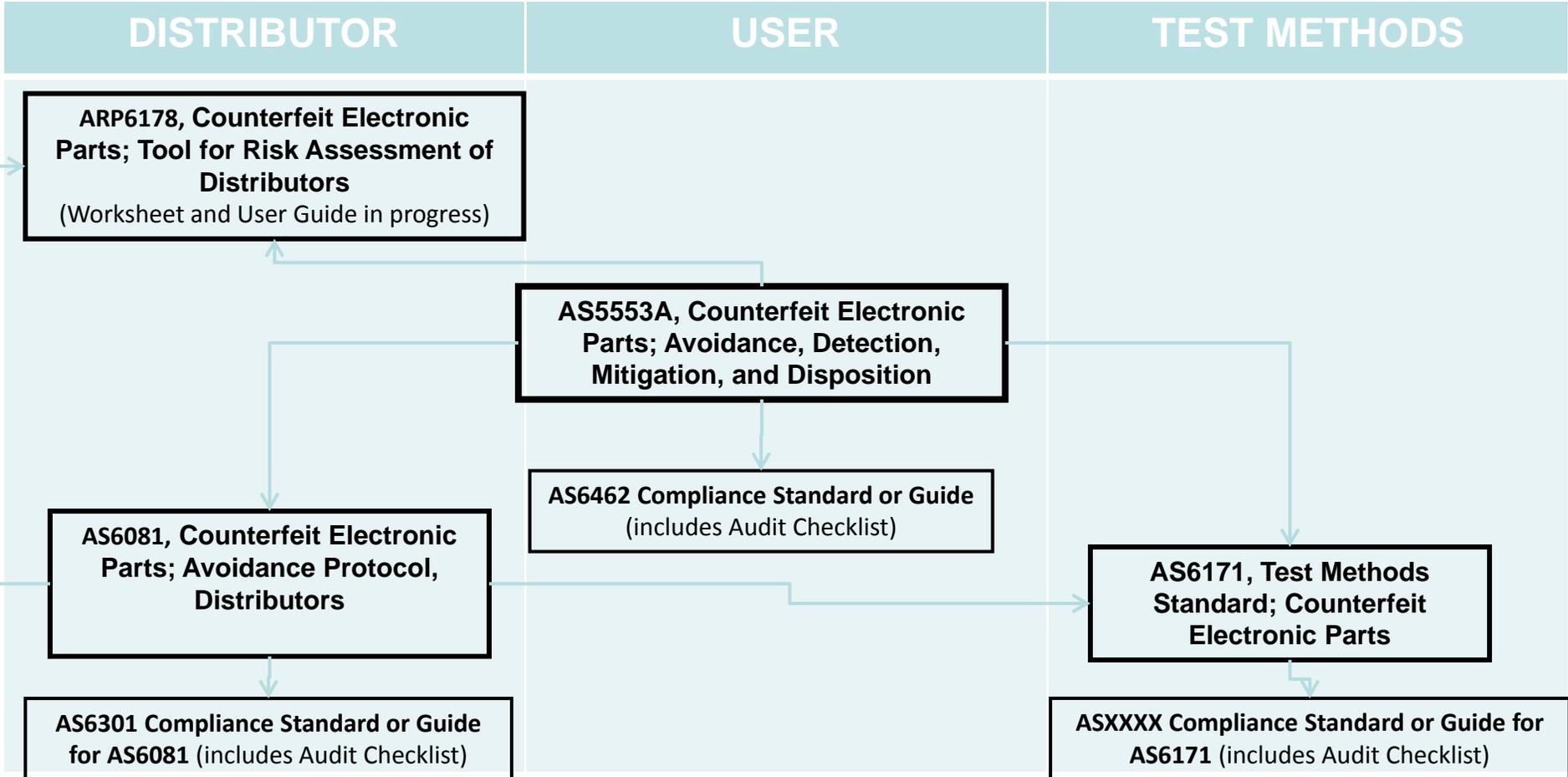
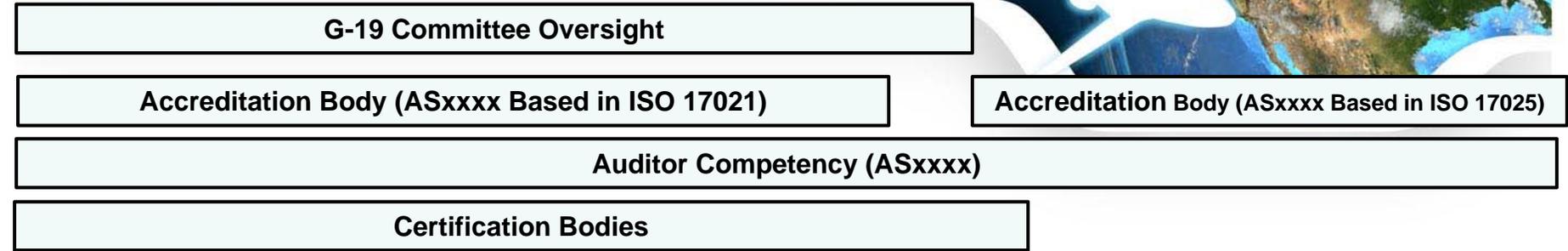
GE Aviation  
Goodrich Control Systems  
Greenberg & Bass  
Harris  
Hi-Reliability Microelectronics  
Hi-Rel Laboratories  
Honeywell Aerospace Electronic Systems  
Honeywell Int'l  
Honeywell Technology Solutions  
Infineon Technologies AG  
Integra Technologies  
Jabil Circuits  
Jacobs Engineering  
Jet Propulsion Laboratory  
L-3 Communications - CSW  
Left Coast Technical Solutions  
Lockheed Martin Aeronautics  
Lockheed Martin Missiles & Fire Control  
3M  
Micram Electronics  
Motronics Circuits International  
Mouser Electronics  
Nisene Technology Group  
Northrop Grumman Electronic Systems  
N.F.Smith & Associates  
NQA  
Northrop Grumman  
Orbital Sciences  
Plexus

Premier Semiconductor Services  
Process Sciences  
Raytheon  
Rochester Electronics  
Sandia National Laboratories  
Schlumberger HPS  
Selex Galileo  
Silicon Cert Laboratories  
SMT Corp  
SolTec Electronics  
Sonix  
Sonoscan  
Star Associates International  
Trace Laboratories  
TTI  
Underwriters Laboratories, UL DQS  
Westland Helicopters  
White Horse Laboratories  
World Data Products  
World Micro  
Wyle Laboratories



# G-19 Subcommittees Formed Since 2009







## AS5553 - Counterfeit Electronic Parts; Avoidance, Detection, Mitigation and Disposition

<b>SAE Aerospace</b> <small>An SAE International Group</small>	<b>AEROSPACE STANDARD</b>	<b>SAE AS5553</b>
		Issued 2009-04
Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition		

### RATIONALE

This standard was created in response to a significant and increasing volume of counterfeit electronic parts entering the aerospace supply chain, posing significant performance, reliability, and safety risks.

This standard was created to establish uniform requirements, practices and methods to mitigate the risks of receiving and installing counterfeit parts.

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“... created in response to a significant and increasing volume of counterfeit electronic parts entering the aerospace supply chain, posing significant performance, reliability, and safety risks.”

and continually improve, safe, reliable globalized aerospace industry complicated this objective. End-product purchasers face the challenge of delivering

This document standardizes requirements, practices, and methods related to: parts management, supplier management, procurement, inspection, test/evaluation, and response strategies when suspect or confirmed counterfeit parts are covered.



## SAE AS5553 and AS5553A Aerospace Standards

### Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

Purpose	Provide uniform requirements, practices and methods to mitigate the risks of purchasing and supplying counterfeit electronic parts
Target Audience	Organization that purchase and/or manufacture products with electrical components
Uses	<ul style="list-style-type: none"><li>• Requirements for developing a Counterfeit Parts Control Plan</li><li>• Guidelines in the appendices for Counterfeit Mitigation industry best-practices</li><li>• Compliance standard under development</li></ul>
Status	<ul style="list-style-type: none"><li>• AS5553 - Issued - April 2009 through G-19</li><li>• AS5553A – Issued – January 2013 through G-19CI</li><li>• Adopted by NASA in November, 2009</li><li>• Adopted by DoD in August, 2009</li><li>• Under revision by G-19CI Committee to AS5553B<ul style="list-style-type: none"><li>• To be aligned with AS 6081 (for distributors)</li></ul></li></ul>



# SAE AS5553A – Aerospace Standard

## Main Subjects Covered:

- Fraudulent/Counterfeit EEE Parts Control Plan inc:
  - Personnel Training
  - Parts Availability - Covered in Annex A
  - Purchasing Process - Appendix B
    - Assessment of Suppliers
    - Supply Chain Traceability - Appendix C
  - Verification of Purchased/Returned Part(s)
  - In-Process Investigation

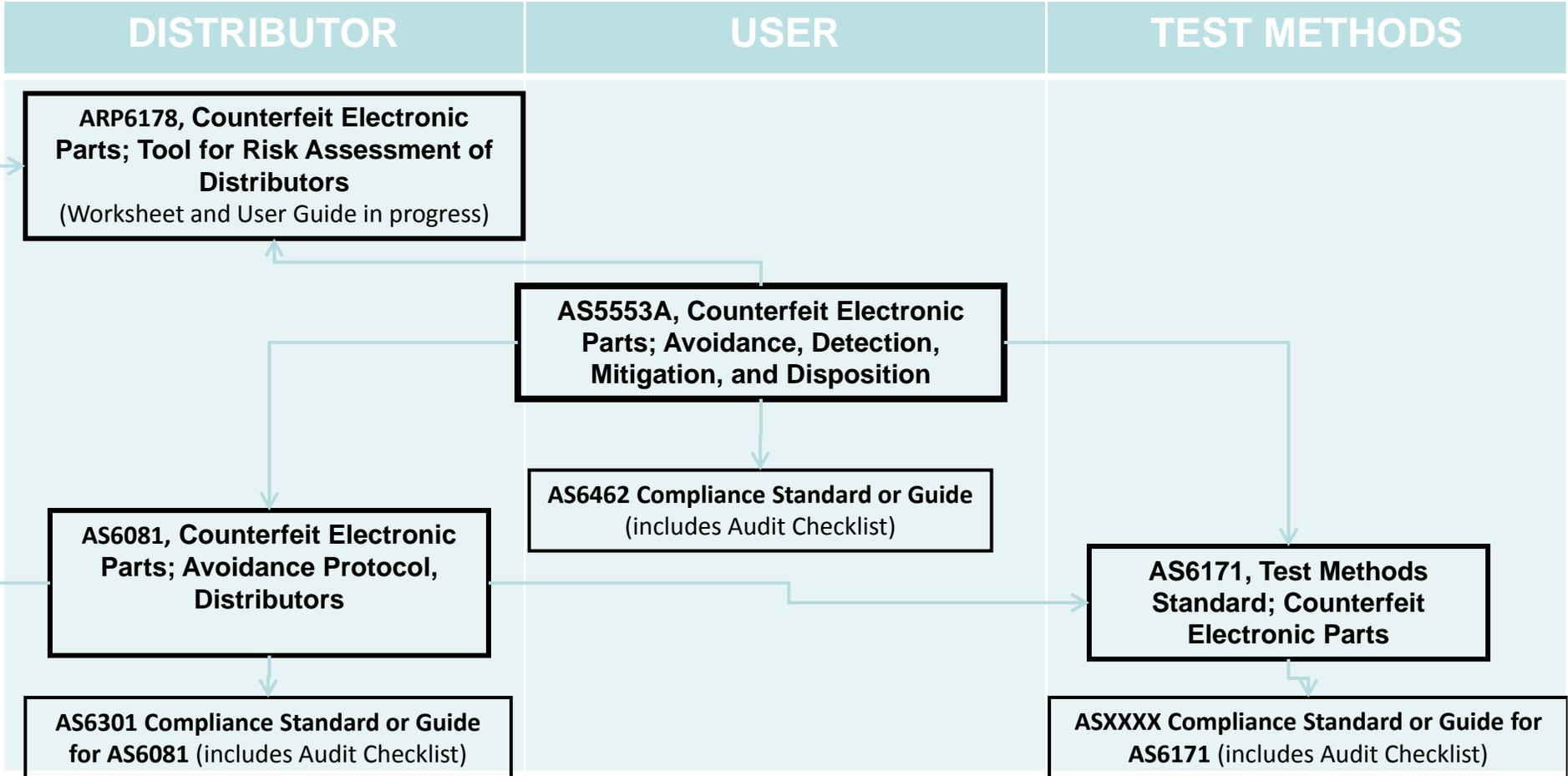
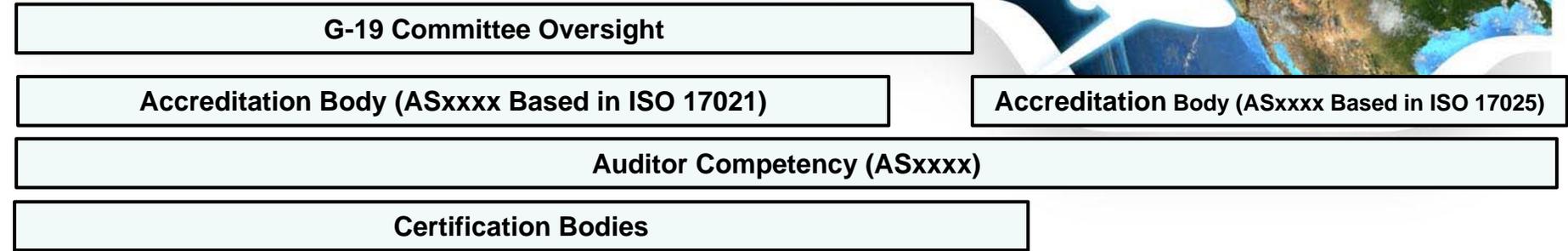


# SAE AS5553A – Aerospace Standard

Subjects covered continued

- In-process Investigation
- Failure Analysis
- Material Control - Appendix F
- Reporting – Appendix G
- Post Delivery Support
- Acronyms and Abbreviations-Appendix H

# Document Roadmap since AS5553





# SAE AS6081 – Aerospace Standard

## Counterfeit Electronic Parts Avoidance – Distributors

Purpose	Standardizes practices to: a. procure parts from reliable sources, b. assess and mitigate risk of distributing counterfeit parts, c. control suspect or confirmed counterfeit parts, d. report suspect and confirmed counterfeit parts to other potential users and Authority Having Jurisdiction, e. and assess, mitigate, control, and report parts which have been used, refurbished, or reclaimed, but represented as new product.
Target Audience	Distributors of Electronic Components
Uses	<ul style="list-style-type: none"><li>• Requirements for a Counterfeit Mitigation program</li><li>• Intended to be used for certification of Distributors (ANAB)</li></ul>
Status	<ul style="list-style-type: none"><li>• Published – November 2012</li></ul>



# SAE AS6081 – Aerospace Standard

## Counterfeit Electronic Parts; Avoidance Protocol, Distributors

- Quality Management System
  - Counterfeit Mitigation Policy
- Counterfeit Electronics Parts Control Plan
  - Customer Related Contract Review, Agreement, & Execution
  - Purchasing
  - Purchase Order Requirements
  - Supply Chain Traceability
  - Verification of Purchased Product
  - Material Control
  - Reporting
  - Personnel Training and Certification

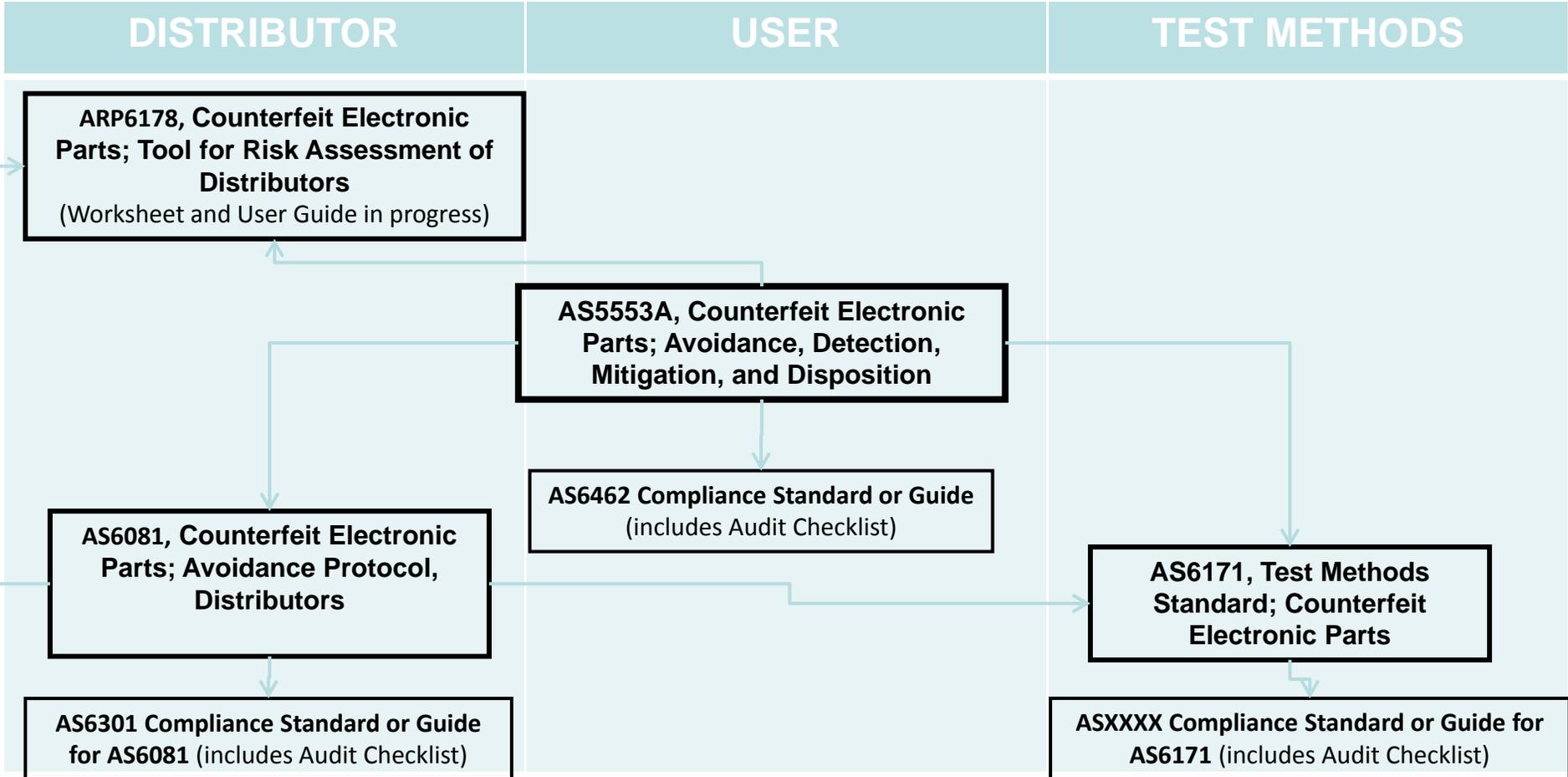
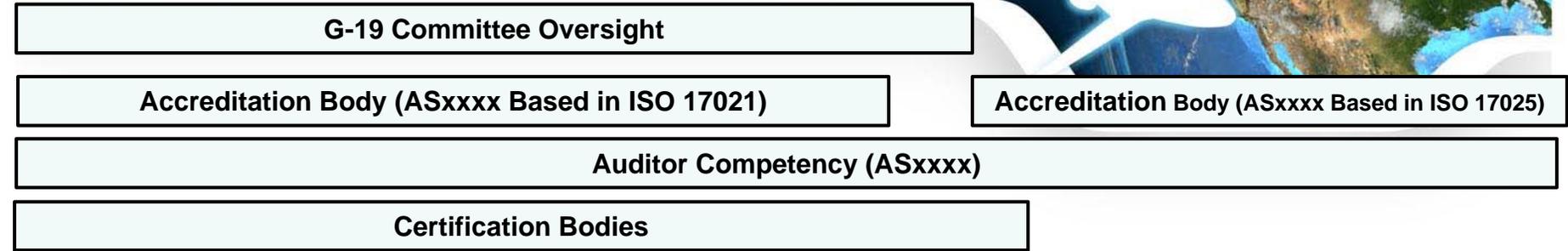


# AS6081 - Counterfeit Electronic Parts; Avoidance Protocol, Distributors



- OEMs can specify their suppliers comply with AS6081 to meet selected flow-down requirements of AS5553
- AS6081 requirements are intended to be applied/flowed down to distributor's suppliers
- Independent, third-party certification bodies (CBs) verify of compliance to AS6081
- Accreditation of Certification Bodies (CB) will be through a recognized and respected accreditation body (AB) to ensure the impartiality and competence of each Certification Body

# Document Roadmap since AS5553





# ARP6178 – (Aerospace Recommended Practice)

## Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

Purpose	Tool for the evaluation of a distributor's processes for the prevention, detection, containment, and reporting of counterfeit electronic components
Target Audience	Distributors of Electronic Components (self assessment) Customers of Distributors (for assessment and the calculation of a risk score)
Uses	<ul style="list-style-type: none"><li>• Develop Risk Assessment score for the Counterfeit Mitigation program</li><li>• NOT intended to be used for certification of Distributors</li></ul>
Status	<ul style="list-style-type: none"><li>• In Draft; balloting expected in late 2011</li></ul>



# SAE ARP6178

## Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors

- Justification for Assessment
- Pre-visit Assessment Survey
- Site Assessment Survey
- Supplier Selection
- Assessment Spreadsheet
  - Survey
  - Tabulates score



## **SAE ARP6178**

### Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors -

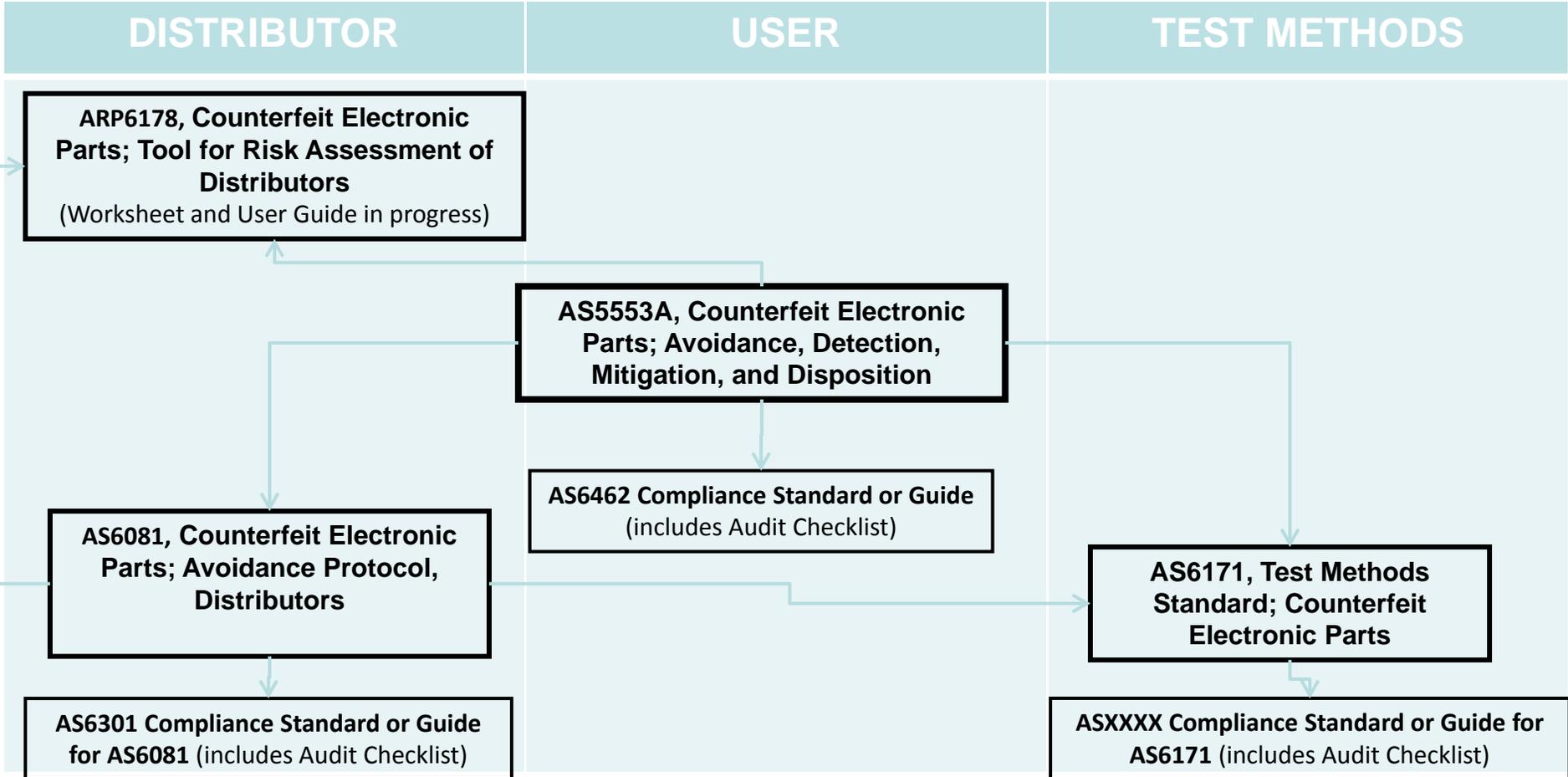
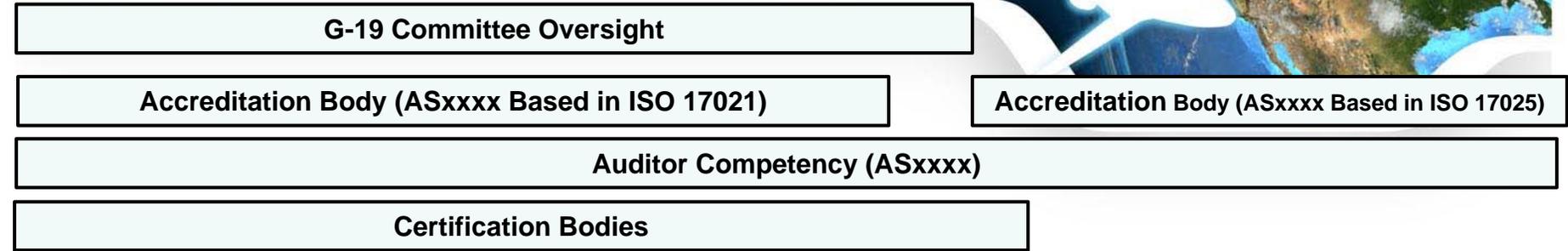
#### – Survey

- General Company Information
- Pre-Assessment Information
- Industry Membership and Reporting
- Quality System and Processes
- Warranty and Insurance
- Supplier Qualification and Purchasing Process
- Handling and Facilities
- Training and Certification
- Inspection and Test
- Non-Conforming Material Control
- Additional Test and Inspection (In-house or Third-Party)



# **ARP6178 – Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors**

- Intended for use by organizations that procure electronic components from suppliers other than the original component manufacturer (OCM)
- Provides organizations with a tool to assess a supplier's capability to prevent, detect, contain and report suspect or confirmed counterfeit electronic components
- Not intended to replace certification compliance criteria





# AS 6171

– Test Methods Standard; Counterfeit Electronic Parts

## Test Methods Standard; Counterfeit Electronic Parts

Purpose	<ul style="list-style-type: none"><li>• Standardize practices to detect suspect counterfeit electronic parts and to ensure consistency of test techniques and requirements across the supply-chain</li></ul>
Target Audience	<ul style="list-style-type: none"><li>• Independent Testing Facilities</li><li>• Distributors (in-house testing capability)</li></ul>
Uses	<ul style="list-style-type: none"><li>• Definition of Test Methods for counterfeit detection</li><li>• Accreditation</li><li>• Intended to be used for accreditation of Independent Test Laboratories or Distributors (ILAC, through ACLASS, A2LA, etc.)</li></ul>
Status	<ul style="list-style-type: none"><li>• In Draft</li></ul>



# AS 6171- Test Methods Standard; Counterfeit Electronic Parts

- Test Methods
  - External visual inspection
  - Radiological inspection,
  - X-ray fluorescence,
  - Remarking and resurfacing,
  - De-lid/ De-capsulation or destructive physical analysis,
  - Electrical tests,
  - Acoustic microscopy,
  - Optical/SEM (Scanning Electron Microscope) inspection,
  - FTIR/DSC/TMA testing and miscellaneous testing
- Risk Criteria and sampling plans
- Personnel Certification requirements



## AS6171 – **Test Methods Standard; Counterfeit Electronic Parts**

Each Test Method section will include:

- Processes and a description of procedures
- Apparatus needed for the test technique
- Required qualification and certification of processes and personnel
- Guidelines and requirements for reporting



## AS6171 – **Test Methods Standard; Counterfeit Electronic Parts**

- Standardize practices to detect suspect counterfeit electronic parts and to ensure consistency of test techniques and requirements across the supply-chain
- Level of testing is risk-based and includes sampling plans
- Accreditation of the Test Laboratory will be through International Laboratory Accreditation Cooperation (ILAC) (ACLASS, A2LA or other laboratory accreditation bodies) to ensure the impartiality and competence of the Test Laboratory



## **AS6171 - Test Methods Standard; Counterfeit Electronic Parts**

- AS6171 will include guidance for:
  - Evaluating risk and recommended tier level of testing based on:
    - Risk of the supplier,
    - Risk of the part,
    - Risk of application, and
    - Other risk factors.
  - Recommended sampling plans for the tests based on tier level of accepted risk, level of confidence required, and acceptable reject criteria.



# AS 6174 – Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel

## Counterfeit Materiel Other than Electronic Parts

Purpose and Uses	<ul style="list-style-type: none"><li>• This SAE Standard standardizes practices to: a. maximize availability of authentic materiel (made from the proper materials using the proper processes with required testing,) b. procure materiel from reliable sources, c. assure authenticity and conformance of procured materiel d. control materiel identified as counterfeit, and e. report counterfeit materiel to other potential users and government investigative authorities</li></ul>
Target Audience	<ul style="list-style-type: none"><li>• Organization that purchase and/or manufacture products other than electrical components</li></ul>
Rationale	<ul style="list-style-type: none"><li>• Created in response to a significant and increasing volume of counterfeit material entering the supply chain</li></ul>
Status	<ul style="list-style-type: none"><li>• Published May 2012</li></ul>



## Committee G-21 Counterfeit Materiel

- April 20, 2010 – DoD PSMC (Part Standardization and Management Committee) requested SAE to address counterfeit NON-electronic parts
- May 14, 2010 – First telecon of new group
- October 4, 2010 – AS6174 based on major rewrite of AS5553 to address all materiel, nearly complete
- Jan-May 2011 – revised to consider Office of the Secretary of Defense (OSD) and WH Intellectual Property Enforcement Coordinator(IPEC) PEC input
- Published May 2012



# AS6174 - Counterfeit Materiel

- For all applications
  - Preference for purchase from original manufacturer or licensed/franchised dist.
  - Extra documentation/testing for other distributors/brokers
- Tracks closely with draft Office of the Secretary of Defense (OSD) and White House (WH) policy for avoiding counterfeits with all materiel, including medicine, tourniquets, etc.



# Summary of SAE G-19 Aerospace Standards

Standard	Title	Status
SAE AS5553A (G19-CI)	Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition	Issued January 2013 and available at <a href="http://www.sae.org">www.sae.org</a>
SAE AS6171 (G19-A)	Test Methods Standard; Counterfeit Electronic Parts	In draft; balloting expected in 3Q- 2012
SAE AS6462 (G19-C)	Verification Criteria for Certification against AS5553	Ballot 4Q-2011; publication likely 4Q- 2012. Negotiations underway with ANAB for certification programs
AIR6273 (G19-T)	Terms and Definitions:	In draft expected late 2012



# Summary of SAE G-19/G-21 Aerospace Standards continued

Standard	Title	Status
SAE AS6081A (G19-D)	Counterfeit Electronic Parts Avoidance – Distributors	Under development. Will cross refer to AS6171.
SAE AS6301 (G19D)	Fraudulent/Counterfeit Electronic Parts: Avoidance, Detection, Mitigation, and Disposition – Distributors Verification Criteria	In draft
SAE ARP6178 (G19-DR)	Counterfeit Electronic Parts; Tool for Risk Assessment of Distributors	Ballots complete; released for publication in Dec 2011
SAE AS6174 (G-21)	Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel	Published May 2012

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Thank you for your time and attention!

Are there any questions?

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