

Counterfeit EEE Parts Risk Mitigation

G-19 Activities

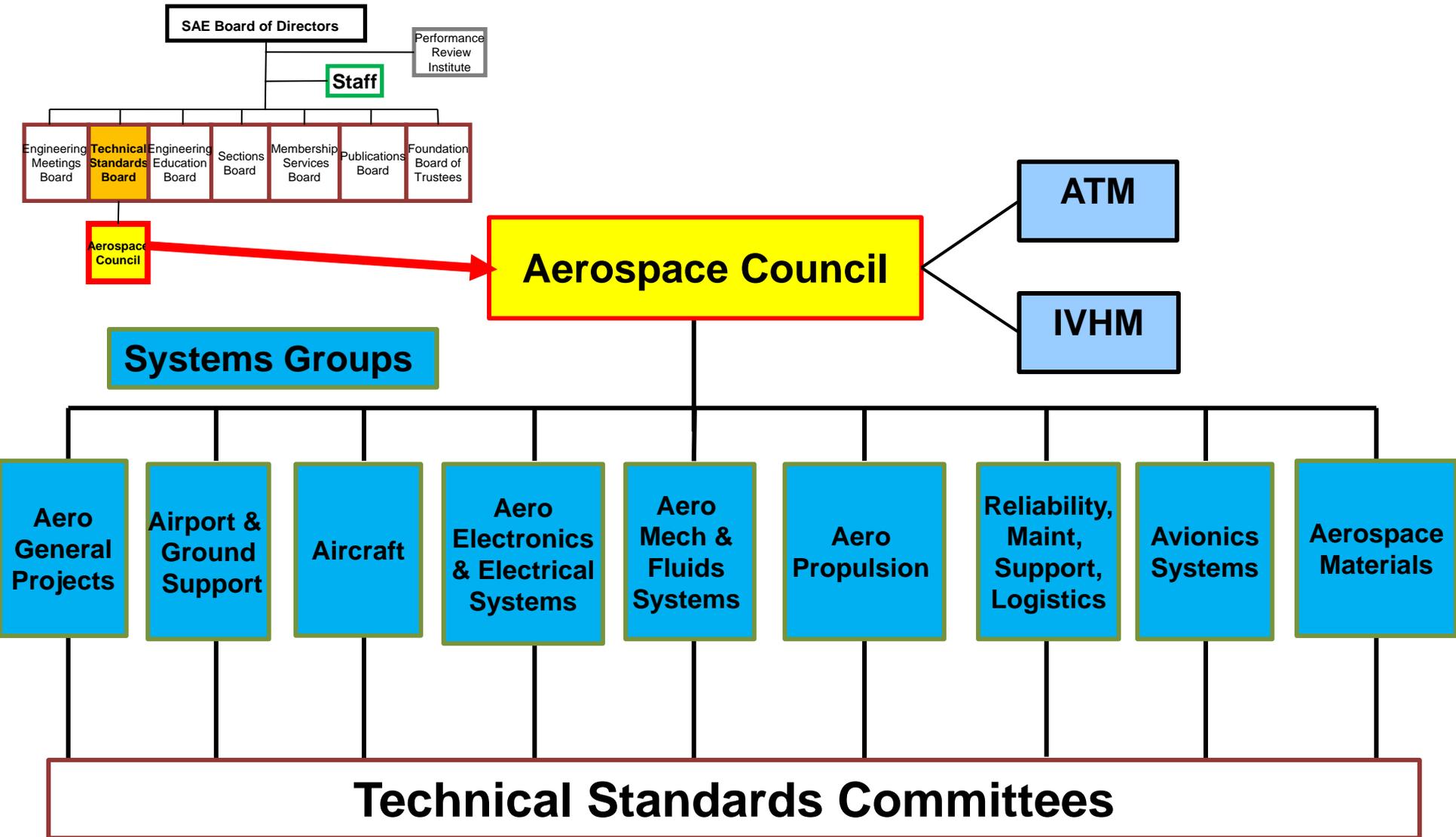
October, 2010

Honeywell

- **SAE G-19 Standards Development Activities**
- **Overview of AS5553 for Buyers/End-Users**
- **Overview of AS6081 for Distributors**
- **Distributor Process Rating Committee**
- **Test Laboratory Standards Development Committee**
- **Organizations Adopting Policies to Address Threat**

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

SAE Organizational Structure: Council Level



Transparent standards development



- The document is proposed
- The technical committee works to develop the document draft
- The draft document is balloted – first by the committee, then by Aerospace Council
- Required changes made; affirmation ballot
- The document is published by SAE

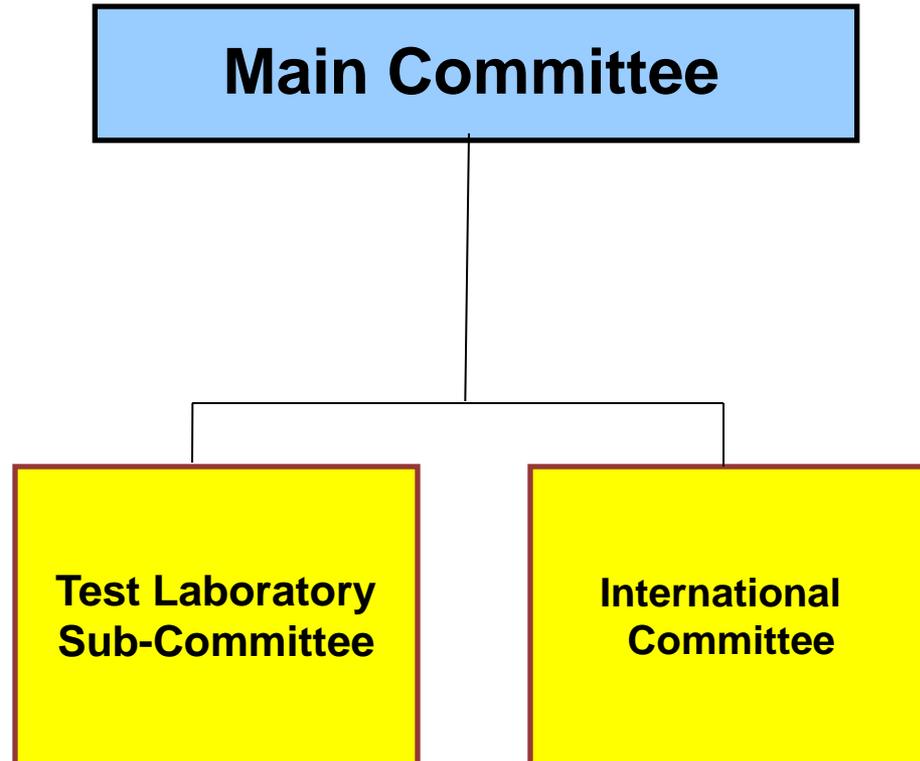
SAE G-19 Committee Scope

The **G-19 Counterfeit Electronic Components** Committee is chartered to address aspects of preventing, detecting, responding to and counteracting the threat of counterfeit electronic components.

G-19 Makeup

- **OEMs**
- **OCMs**
- **Regulators, Government & Military Agencies**
- **Legal Experts**
- **Industry associations**
- **Distributors**
- **Research Laboratories**
- **Suppliers**
- **Independent Experts, Consultants**

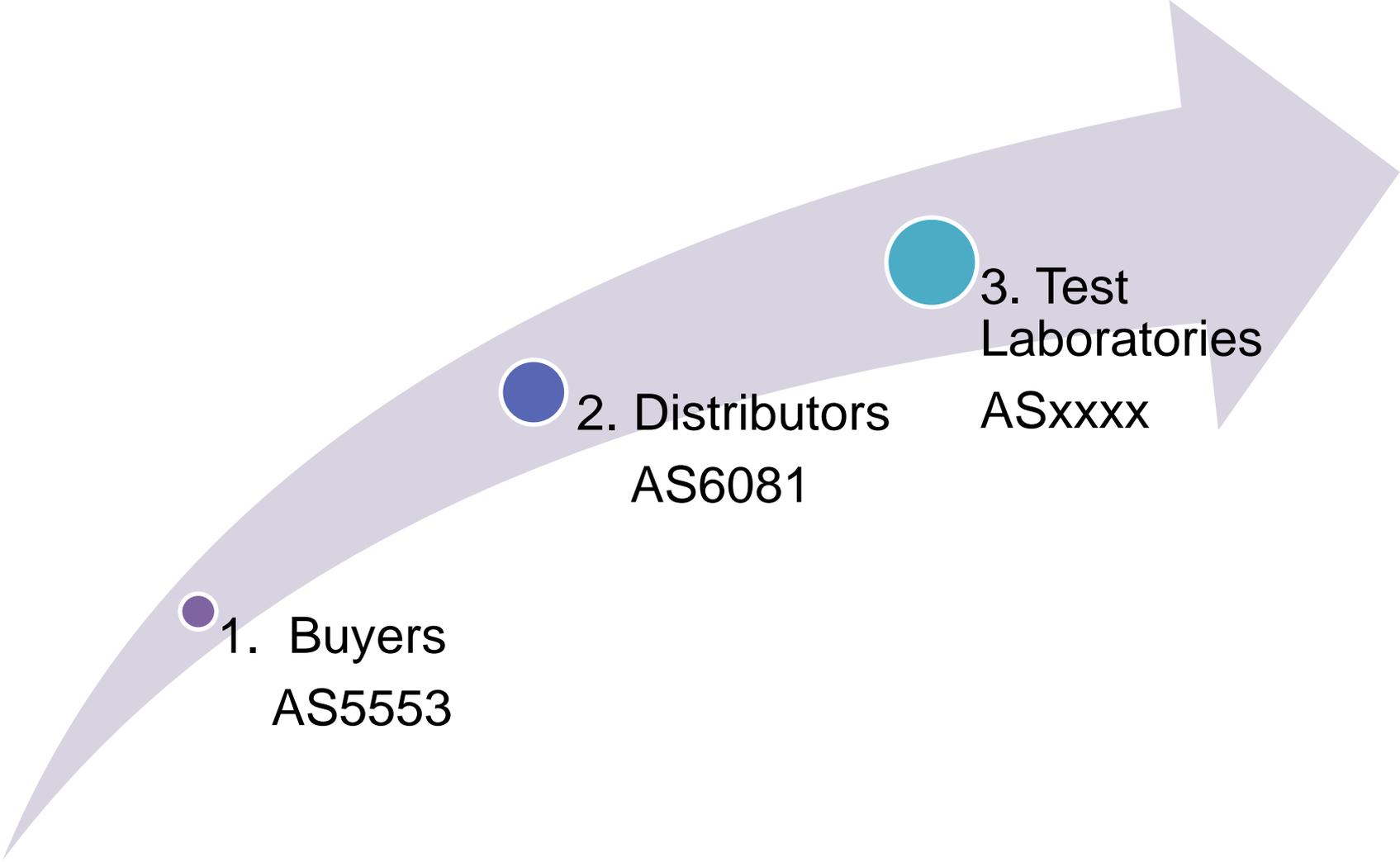
SAE G-19 Committee Structure



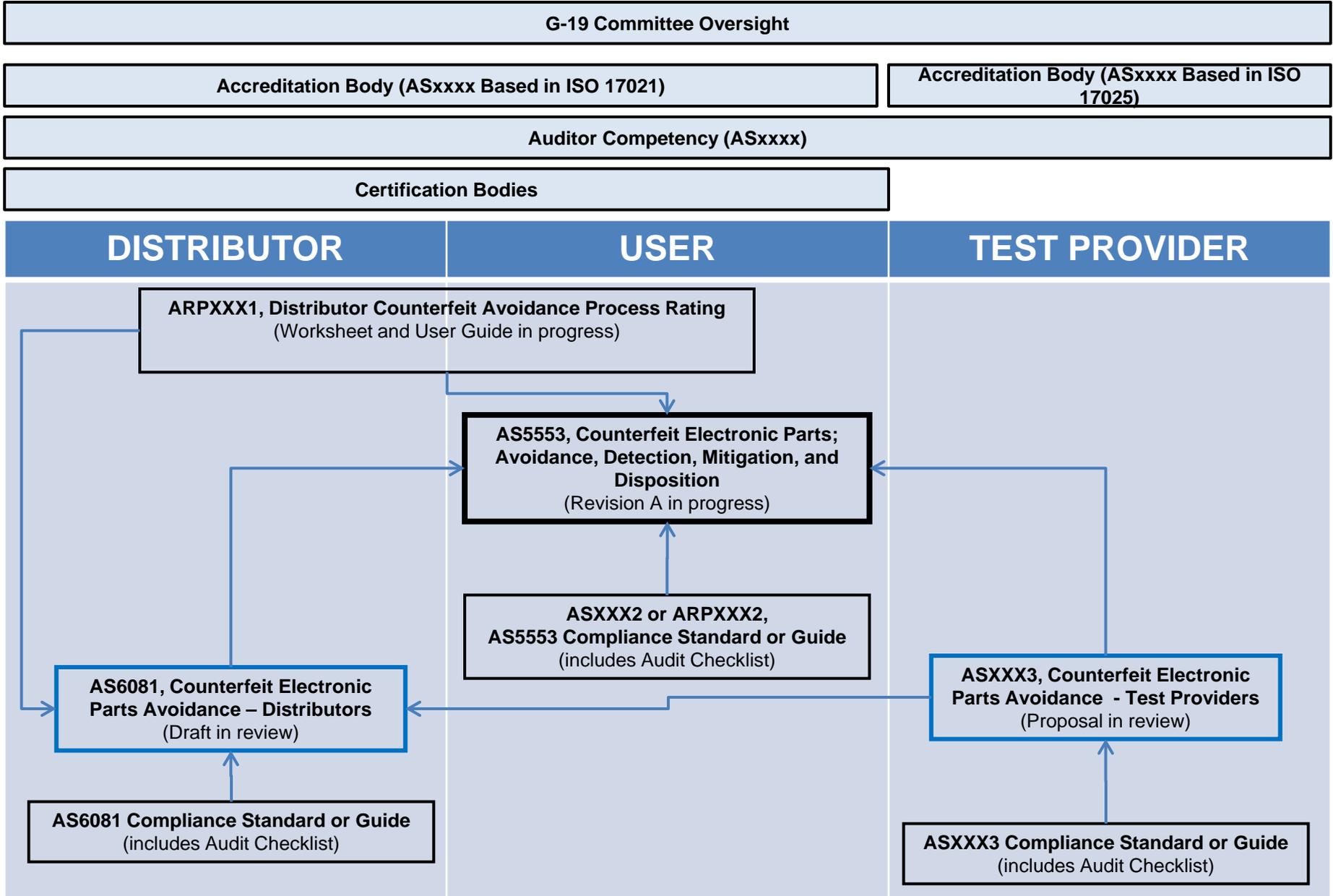
SAE G-19 Committee Meetings

- 70 Committee Members
- Standards developed in regular virtual (teleconference, Webex) meetings

G-19 Supplier Certification Standards



SAE G-19 Document Roadmap, September 2010



SAE AS5553 Requirements



Counterfeit Parts Control Plan:

“... The organization **shall develop and implement a counterfeit electronic parts control plan** that documents its processes used for risk mitigation, disposition, and reporting of counterfeit parts...”

4.1 Counterfeit Electronic Parts Control Plan

The organization shall develop and implement a counterfeit parts control plan that documents its processes used for risk mitigation, disposition, and reporting of counterfeit parts. The control plan shall include the following sections: 4.1.1 through 4.1.7 below.

4.1.1 Parts Availability

The processes shall maximize availability of authentic, originally designed and/or qualified parts throughout the product's life cycle, including management of parts obsolescence. Information and guidance for ensuring parts availability is provided in Appendix A, Parts Availability.

Counterfeit Parts Control Plan: Parts Availability

“... The process shall maximize availability of authentic, originally designed ... parts throughout the product’s life cycle, including management of part obsolescence...”

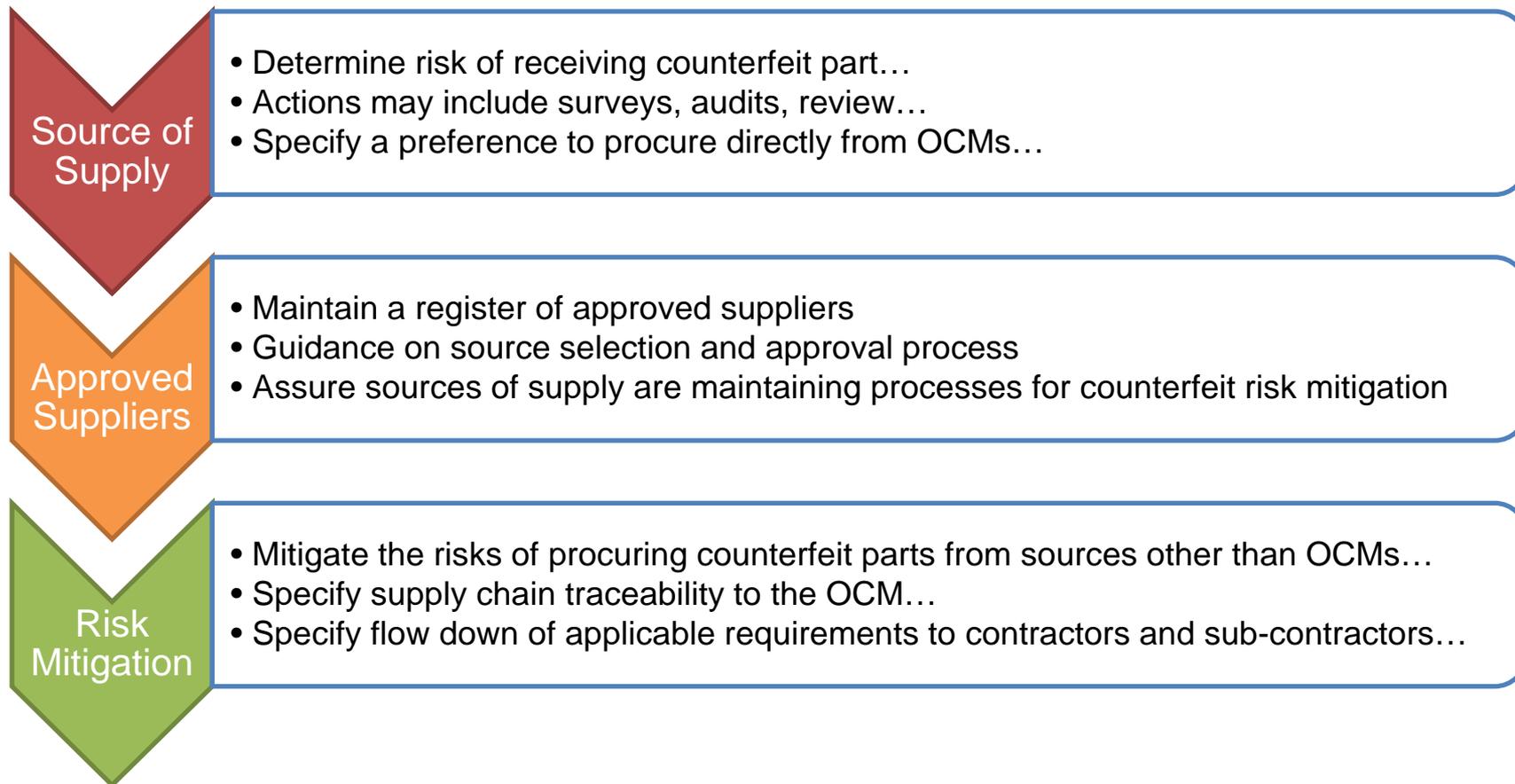
4.1 Counterfeit Electronic Parts Control Plan
The organization shall develop and implement a control plan that documents its processes used for managing counterfeit parts. The control plan shall be approved by the organization and shall be maintained in accordance with 4.1.1 through 4.1.7 below.

4.1.1 Parts Availability

The processes shall maximize availability of authentic, originally designed and/or qualified parts throughout the product’s life cycle, including management of parts obsolescence. Information and guidance for ensuring parts availability is provided in Appendix A, Parts Availability.

Requirements

Counterfeit Parts Control Plan: Purchasing Process



Requirements

Counterfeit Parts Control Plan: Purchasing Information & Verification

“ ...This documented process shall **specify contract/purchase order quality requirements** ... ”

“...The documented process **shall assure detection of counterfeit parts** prior to formal product acceptance...”

Requirements

Counterfeit Parts Control Plan:

In Process Investigation

Shall address the detection, verification, and control of ... counterfeit parts.



Material Control

Shall control ... nonconforming parts from entering supply chain

Shall control counterfeit parts to preclude their use ...



Reporting

Shall assure that all occurrences of counterfeit parts are reported...

Example Procurement Clause

D.3.1 Test and Inspection Requirements

“The seller shall establish and implement test and inspection activities to assure the authenticity of purchased products.”

- Traceability and documentation verification,
- Visual examination
- [see Appendix E of this Aerospace Standard for test and inspection activities]

“ ...The seller shall **establish and implement test and inspection activities** necessary to assure the authenticity ... ”

Tests and inspections shall be performed in accordance with clearly delineated accept/reject criteria provided or approved by <BUYER>. The seller shall prepare and provide to the <BUYER> records evidencing tests and inspections performed and conformance of the product to specified acceptance criteria.

Tests and inspections shall be performed by persons that have been trained and qualified concerning types and means of electronic parts counterfeiting and how to conduct effective product authentication.”

Solutions



QMS & Counterfeit Parts Control Plan:

“ ...The organization shall **develop and implement a quality management system** (e.g, ISO 9001, SAE AS9120 ... ”

“ ... The organization shall **develop and implement a counterfeit electronic parts control plan** that documents its processes used for risk mitigation, disposition, and reporting of counterfeit parts... ”

4.1 Quality Management System

The organization shall develop a quality management system standard (e.g., ISO 9001, SAE AS9120). In the quality management system standard, the organization shall comply with SAE AS9120.

4.2 Counterfeit Electronic Parts Control Plan

The organization shall develop a counterfeit electronic parts control plan for risk mitigation, disposition, and reporting of counterfeit parts. The control plan shall include paragraphs 4.1.1 through 4.1.7.

Counterfeit Parts Control Plan: Purchasing Information & Supply Chain Traceability

“ ... The process shall **specify contract/purchase order quality requirements ... including the flow down of applicable requirements of this document ...** ”

4.2.1.2 Purchasing Information

The documented process shall specify requirements to minimize the risk of flow down of applicable requirements procurement quality requirements Procurement Contract Requirements

4.2.1.2 Supply Chain Traceability

The documented processes shall require supply chain traceability wherever such shall provide traceability to the OCM identifies the name and location of all procurement lots, and the date of all manufacturer to the direct source of records shall be available for customer traceability is unavailable, the customer shall be notified solicitation.

“ ...The documented processes shall **require ... traceability to the OCM... If...unavailable, the customer shall be notified...** ”

Requirements

Counterfeit Parts Control Plan: *Verification of Purchased Product*

4.2.1.3 Verification of Purchased Product

The documented processes shall specify test and inspection methods for the detection of counterfeit parts. The rigor of the verification process shall be defined for the receiving counterfeit parts. The test and inspection methods for the detection of counterfeit parts shall be defined for all inspection points.

Results of each inspection and test shall be documented and traceable to product identification (part number), purchase order, invoice, and inspection/tolerance report. Failing authenticity inspection/tolerance report shall be reported to the customer upon request.

All personnel performing inspection and test activities shall be formally qualified for the specific inspections and test that they perform based on demonstrated competency.

Product test and inspection requirements are provided in Appendix C, Product Assurance.

“ ...The documented processes shall **specify test and inspection methods** for the detection of counterfeit parts...**Results** of each inspection and test performed **shall be documented, retained, and traceable to product information** ... ”

Requirements

Origin and Evolution of the Rating Scheme

- Government agencies and prime contractors all have their own IDs & brokers they prefer.
- MDA & NASA poll government agencies and prime contractors on their Independent Distributor ASL.
- MDA & NASA concerned with the lack of information about the IDs and brokers.
- MDA creates assessment form.
- MDA-QS starts site visits.
- NASA/JPL assist in the visits through JAPC audits.

Framework of Distributor Process Rating



Test Laboratory Standards Development Committee Scope/Charter Statement

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Scope/Charter Statement

To develop an Aerospace Standard to detect suspect counterfeit components, authentic parts, and to ensure supply chain for test techniques and requirements.

The standard will include requirements for:

Minimum testing for each subcomponent in the absence of a risk evaluation from the manufacturer.
Minimum sampling in the absence of a risk evaluation from the end-user.

The standard will include guidance for:

Evaluating risk and recommended tier level of testing based on risk of the supplier, the item, 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 rate.

“ To develop an Aerospace Standard that **standardizes practices to detect suspect counterfeit components**, to maximize the use of authentic parts, **and to ensure consistency across the supply-chain for test techniques and requirements.** ... ”

Create Industry Consensus on Test & Inspection

SAE G-19A Sub-Committee Members

Representation from Gov't, Aerospace, Military, & Commercial

US Government Members ...

- DCMA
- Defense Logistics Agency
- IARPA
- MDA
- NASA/JPL
- Navy-Crane
- NSWC Crane
- SUBMEPP
- Tinker Air Force
- US Army - AMRDEC

Participating Industry Association ...

- Independent Distributors of Electronics Association (IDEA)

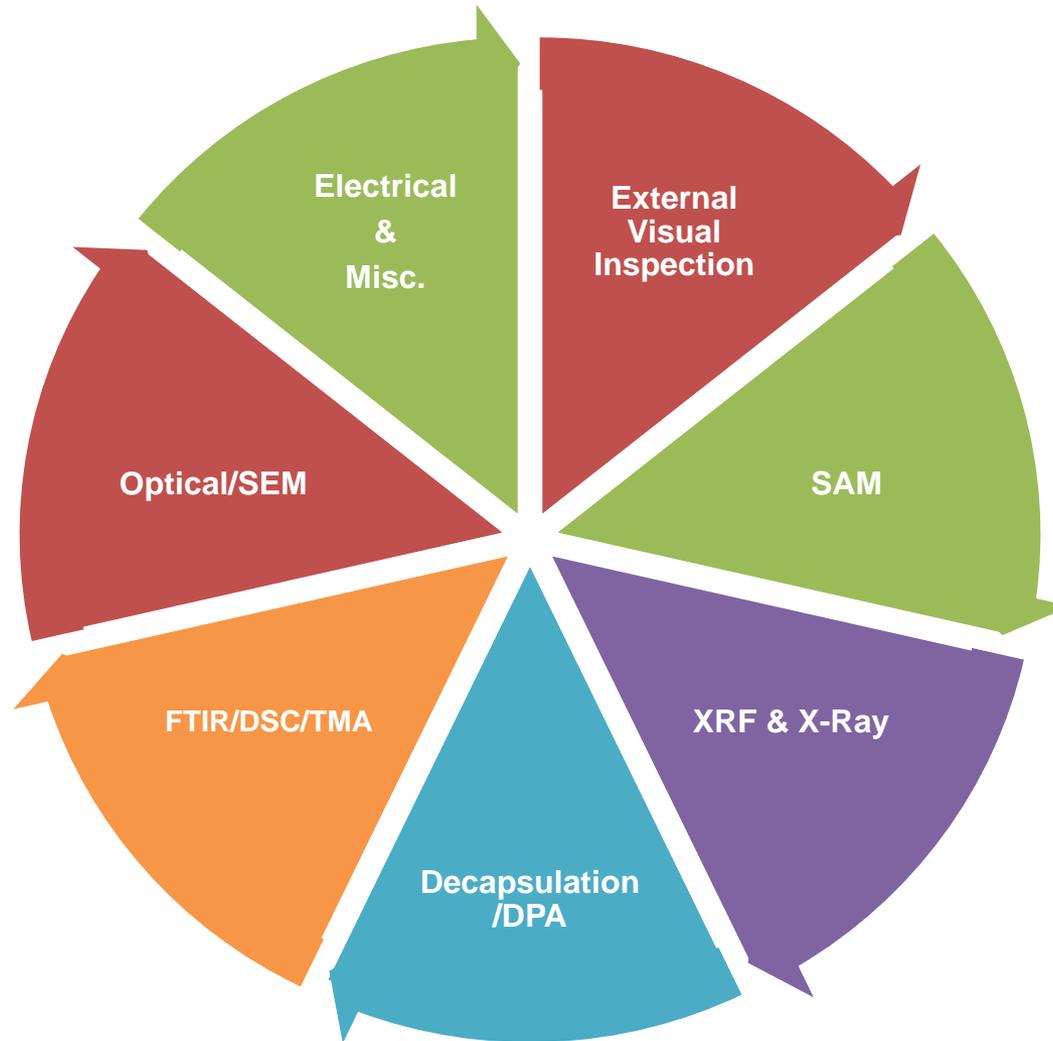
Participating Test Laboratories ...

- Center for Advanced Life Cycle Engineering (CALCE)
- Evans Analytical Group
- Hi-Reliability Microelectronics
- Integra Technologies
- Premier Semiconductor Services
- Process Sciences
- Silicon Cert Laboratories
- Trace Laboratories
- White Horse International

Industry Members ...

- Boeing
- General Dynamics
- Honeywell
- L-3 Communications
- Left Coast Tech. Svc's
- Lockheed Martin
- Northrup Grumman
- NQA
- PerkinElmer
- Plexus
- Raytheon

Test Laboratory Sub-Group Activity



Many Additional SME's Participate in Sub-Groups

Standardize Test & Inspection Requirements Across Industry

Type of Part

Testing Technique

Test Matrix – testing performed by certified test laboratories (Asxxxx)

Testing Tier

Sampling Plan

Risk Based Recommendations

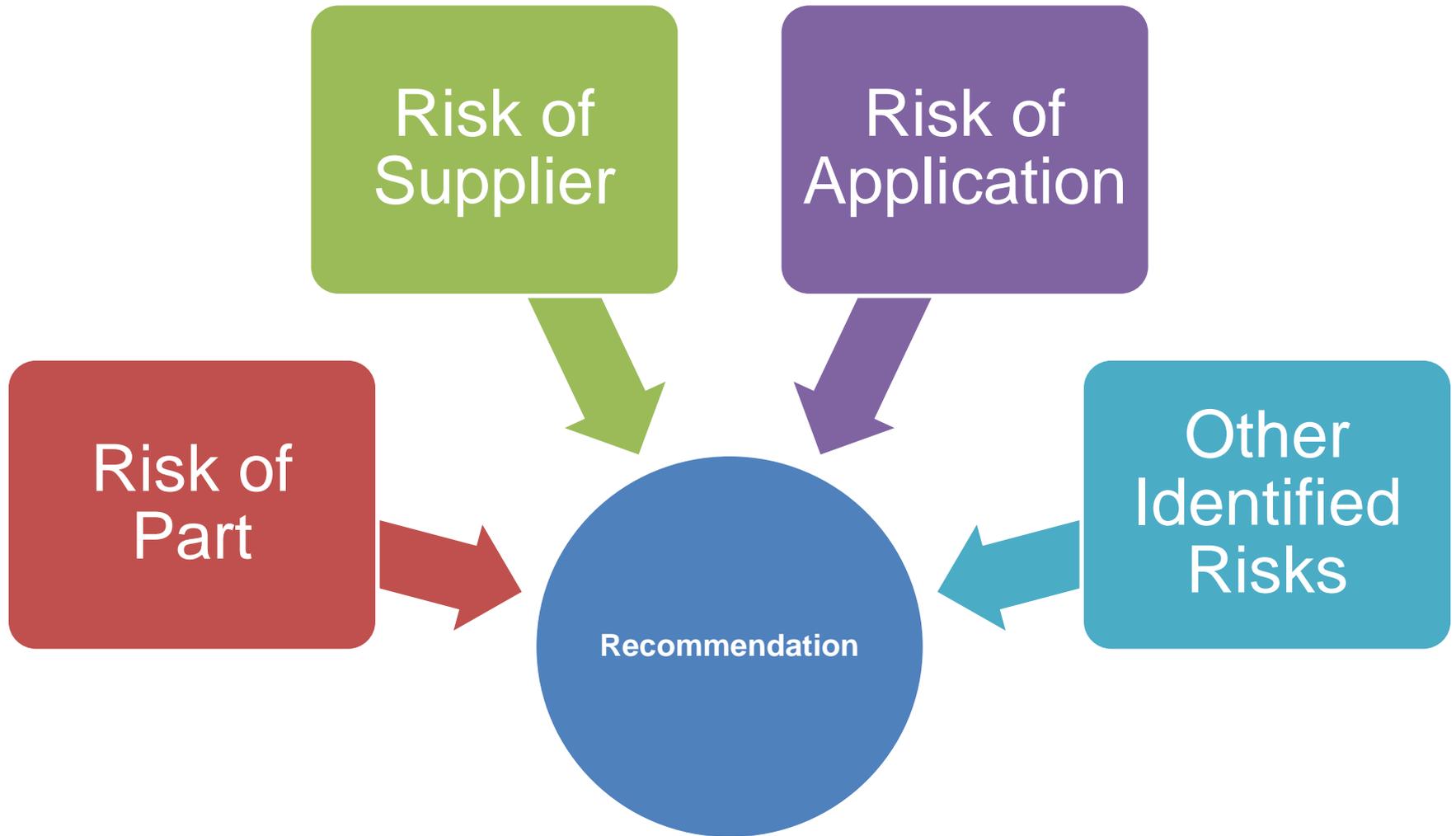
Application

Part

Supplier

System intended to create standardized testing methodology throughout industry

Recommended Risk Decision Tree



Testing Level Based on Risk

Level 0

- External Visual Inspection
- Marking permanency
- Internal Die De-cap and inspection
- Optional: (X-RAY, XRF, Hermeticity, SAM, Solderability & others...)

Level 1

- 25C limited DC testing at room temp
- (Device pin DC characteristics)

Level 2

- DC parametric testing at 2 room temp
- (Selected key DC datasheet parameters)

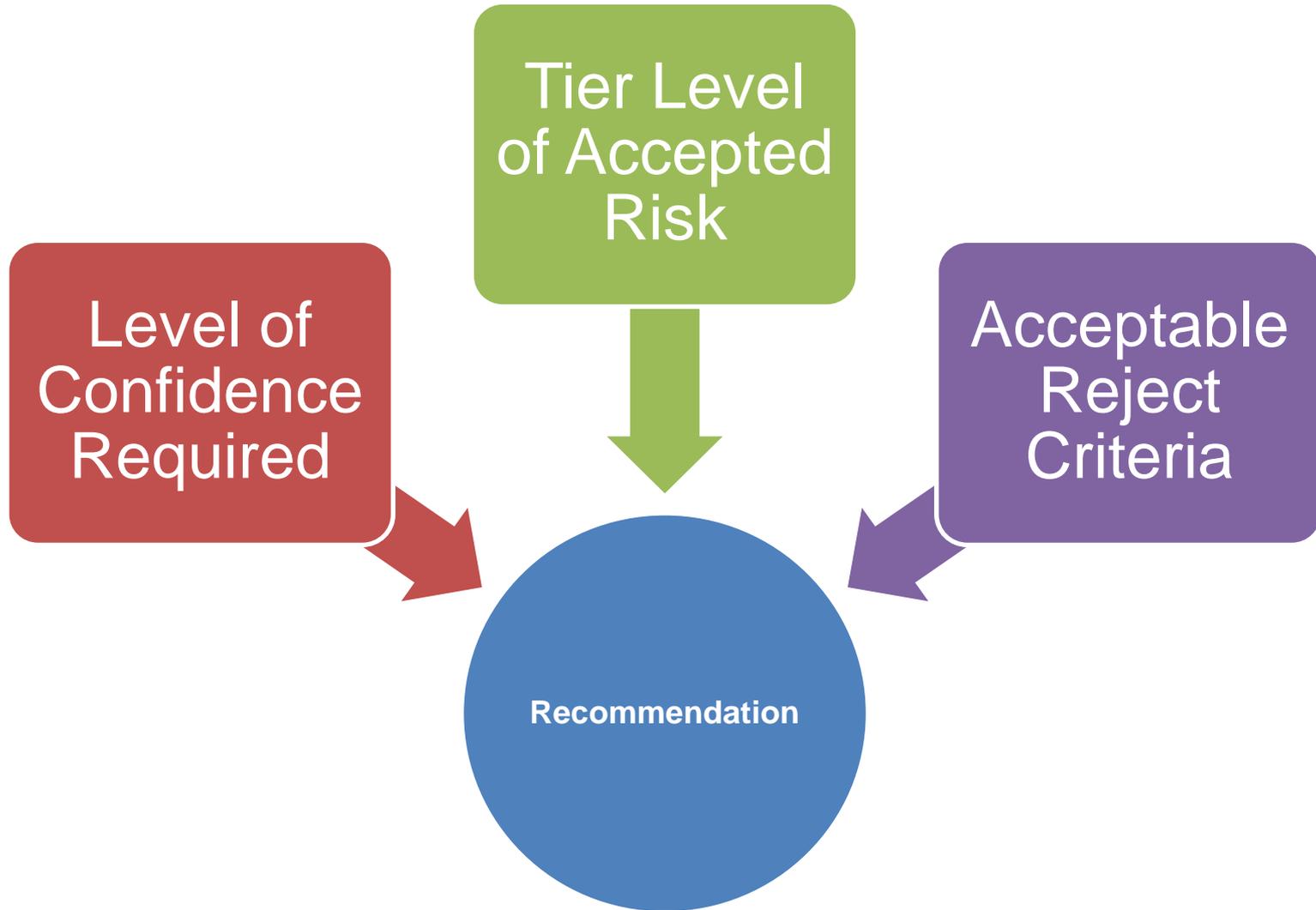
Level 3

- DC parametric testing & functionality at room temp
- (Key DC datasheet parameters & basic device functionality)

Level 4

- DC parametric testing & AC parameters at room temp
- (Key DC & AC datasheet parameters including device functionality)

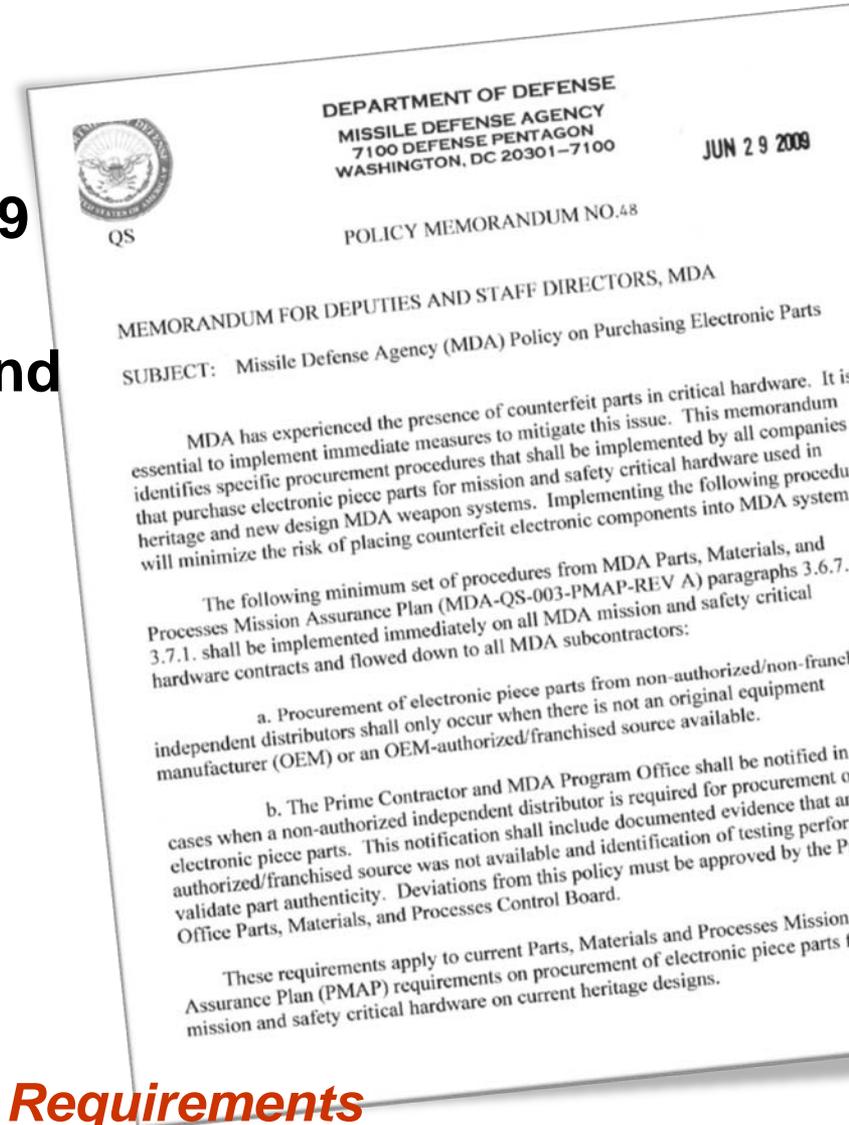
Recommended Sampling Plan



Counterfeit Parts Control Plan

Organizations Adopting Policies:

- NASA Policy Directive 8730.2C
- MDA Policy Memo and PMAP
- DOD adopts AS5553 August 2009
 - SMC and NRO do not accept AS5553 in it's current form and have more stringent requirements
- Other companies with plans:
 - BAE Systems
 - Orbital Sciences Corp.
 - Lockheed Martin
 - Honeywell
 - Ball Aerospace



Flow Down will Invoke Requirements

- **Understand G-19 Activities**
- **Understand the AS5553 for Buyers and the AS6081 for Distributors**
- **Awareness of G-19 Future Developments**
- **Understand trend of organizations adopting standards and invoking requirements**

Thank you for your time!

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Questions?