SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS5553 | REV. A

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Superseding AS5553

(R) Fraudulent/Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition

RATIONALE

This standard was originally created in response to a significant and increasing volume of fraudulent/counterfeit electronic parts entering the aerospace supply chain, posing significant performance, reliability and safety risks. This document has subsequently been expanded to address fraudulent/counterfeit risk mitigation on a global scale across multi-sector electronic supply chain industries and to provide uniform requirements, practices and methods to mitigate the risks of receiving and installing fraudulent/counterfeit electronic parts.

FOREWORD

To meet customer requirements, electronics industry organizations must produce, and continually improve, safe and reliable products that meet or exceed customer and regulatory authority requirements. The globalization of the aerospace industry and the resulting diversity of regional/national requirements and expectations have complicated this objective. End-product organizations face the challenge of assuring the quality and integration of product purchased from suppliers throughout the world and at all levels within the supply chain. Aerospace suppliers and processors face the challenge of delivering product to multiple customers having varying quality expectations and requirements.

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

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SAE WEB ADDRESS: **http://www.sae.org**

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS5553A

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1. SCOPE

1.1 Purpose

This SAE Aerospace Standard standardizes practices to:

a. maximize availability of authentic parts,

b. procure parts from reliable sources,

c. assure authenticity and conformance of procured parts,

d. control suspect or confirmed fraudulent/counterfeit EEE parts,

e. and report suspect or confirmed fraudulent/counterfeit EEE parts to other potential users and Authority Having Jurisdiction.

f. and assess, mitigate, control, and report parts which have been used, refurbished, or reclaimed, but represented as new product.

1.2 Application

This standard is for use by organizations that procure and/or integrate electronic parts and/or assemblies containing such items. The requirements of this standard are generic and intended to be applied/flowed down through the supply chain to all organizations that procure electronic parts and/or assemblies, regardless of type, size and product provided. The mitigation of fraudulent/counterfeit EEE parts in this standard is risk-based and will vary depending on the desired performance or reliability of the equipment/hardware.

NOTE: The following diagram illustrates to whom AS5553 applies to in an Aerospace supply chain landscape. It is an example of the types of organizations who may benefit from the adoption of AS5553 and is not exhaustive or intended to replicate other industries.

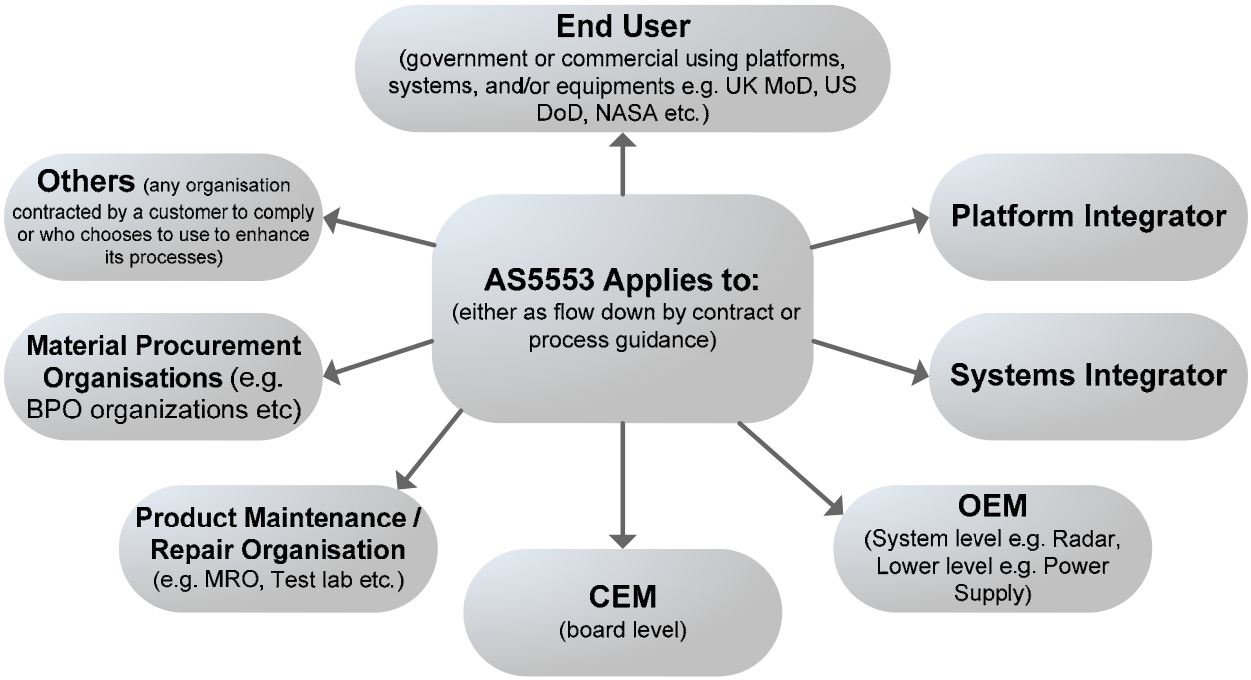

FIGURE 1

2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

The requirements of this document are intended to supplement the requirements of a higher level quality standard (e.g., AS9100) and other quality management system documents. They are not intended to stand alone, supersede, or cancel requirements found in other quality management system documents, requirements imposed by contracting authorities, or applicable laws and regulations unless an authorized exemption/variance has been obtained.

Counterfeiting is not a static process. As new methods are devised by industry to discriminate fraudulent/counterfeit EEE parts, new methods are introduced by counterfeiters to disguise their parts. In an effort to keep ahead of the evolution of counterfeiting, the SAE, in addition to other industry organizations, continue to develop new and/or revised standards to mitigate the risk of use of fraudulent/counterfeit EEE parts.

NOTE: Additional information and works in progress can be viewed on the SAE Anti-Counterfeiting web portal at http://counterfeitparts.sae.org/

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

ARP9009 Aerospace Contract Clauses

AS9100 Quality Management Systems - Requirements for Aviation, Space and Defense Organizations

AS9120 Quality Management Systems - Requirements for Aviation, Space and Defense Distributors

2.2 ISO Publications

Available from ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56 CH-1211, Geneva 20, Switzerland, www.iso.org or from ISO members. ISO 9000 Quality Management Systems - Fundamentals and Vocabulary

ISO 9001 Quality Management Systems - Requirements

2.3 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

EIA-4899 Standard for Preparing an Electronic Components Management Plan

2.4 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, https://assist.daps.dla.mil/quicksearch/.

MIL-PRF-19500 Semiconductor Devices, General Specification For

MIL-PRF-38535 Integrated Circuits (Microcircuits) Manufacturing, General Specification For

OMB Policy Letter 91-3 Reporting Nonconforming Products (not available through the ASSIST database; it may be obtained using the following link: http://whitehouse.gov/omb/procurement_policy_letter_91-3/)

SD-22 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Guidebook

MIL-STD-3018 Parts Management

2.5 Commercial Publications

GEIA GEB1 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Practices

IDEA-STD-1010 Acceptability of Electronic Components Distributed in the Open Market

JEDEC JESD31 General Requirements for Distributors of Commercial and Military Semiconductor Devices

IEC TS 62239 Process Management for Avionics - Preparation of an Electronic Components Management Plan

IEC 62402:2007 Obsolescence Management - Application Guide

TechAmerica STD-0016 Standard for Preparing a DMSMS Management Plan

2.6 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Aerospace Technical Report.

2.6.1 ANSI Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ANSI/ESD S20.20 Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)

2.6.2 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, https://assist.daps.dla.mil/quicksearch/.

MIL-PRF-38534 Hybrid Microcircuits, General Specification For

MIL-STD-202 Electronic and Electrical Component Parts

MIL-STD-750 Test Methods for Semiconductor Devices

MIL-STD-883 Test Method Standard - Microcircuits

MIL-STD-1580 Destructive Physical Analysis for Electronic, Electromagnetic, and Electromechanical Parts

2.6.3 Commercial Publications

JEDEC JESD22-B107 Marking Permanency

DO-254 Design Assurance Guidance for Airborne Electronic Hardware (RTCA, Inc. www.rtca.og)

IEC TS 62668-1 Process Management for avionics - Counterfeit Prevention - Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic components (IEC www.iec.ch)

3. TERMS AND DEFINITIONS

For the purposes of this document, the terms and definitions listed in ISO 9000 and the following apply:

Throughout the text of this document, wherever the term “product” occurs, it can also mean service.

3.1 Suspect Part

A part in which there is an indication that it may have been misrepresented by the supplier or manufacturer and may meet the definition of fraudulent part or counterfeit part provided below.

3.2 Fraudulent Part

Any suspect part misrepresented to the Customer as meeting the Customer’s requirements.

3.3 Counterfeit Part

A fraudulent part that has been confirmed to be a copy, imitation, or substitute that has been represented, identified, or marked as genuine, and/or altered by a source without legal right with intent to mislead, deceive, or defraud.

NOTE: The following diagram (Figure 2) depicts the above interrelationship between Suspect, Fraudulent and Counterfeit Parts. A Suspect Part may be determined to be, fraudulent or counterfeit through further evaluation and testing. All counterfeit parts are fraudulent, but not all fraudulent parts are counterfeit.

Examples of Suspect, Fraudulent, and Counterfeit Parts are provided in Appendix A.

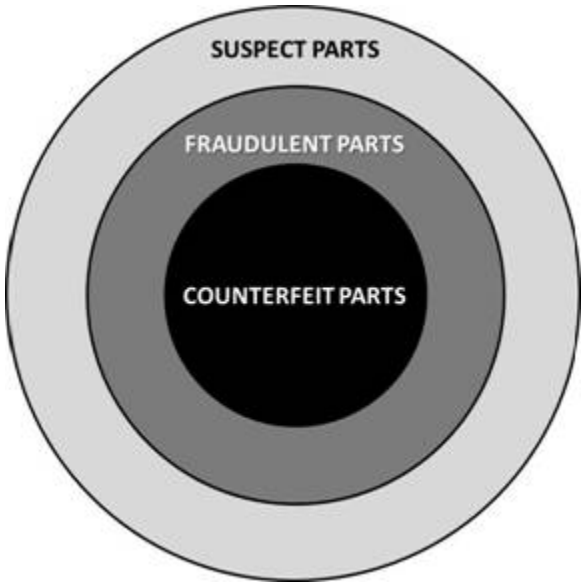

FIGURE 2 - INTERRELATIONSHIP BETWEEN SUSPECT, FRAUDULENT, AND COUNTERFEIT PARTS

3.4 Related Definitions

ACCREDITATION: The means by which an authoritative body gives formal recognition that an audit organization is competent to carry out specific tasks and provides assurance to end users in the public and private sectors that the audit organization continues to operate according to internationally-accepted criteria.

AFTERMARKET MANUFACTURER: A manufacturer that meets one or more of the following criteria:

1. The manufacturer is authorized by the OCM to produce and sell replacement parts, usually due to an OCM decision to discontinue production of a part. Parts supplied are produced from materials that have been

   a. transferred from the OCM to the Aftermarket Manufacturer, or

   b. produced by the Aftermarket Manufacturer using OCM tooling and intellectual property (IP).

2. The manufacturer produces parts using semiconductor dice or wafers, manufactured by and traceable to an OCM, that have been properly stored until use and are subsequently assembled, tested, and qualified using processes that meet technical specifications without violating the OCM's intellectual property rights (IPR).

3. The manufacturer produces parts through emulation, reverse-engineering, or redesign, that match the OCM's specifications and satisfy customer needs without violating the OCM's IPR.

In any case, the Aftermarket Manufacturer must label or otherwise identify its parts to ensure that the "as shipped" aftermarket manufactured part should not be mistaken for the part made by the OCM.

APPROVED SUPPLIER: Suppliers that are assessed and determined to provide acceptable fraudulent/counterfeit parts risk mitigation process.

AUTHORITY HAVING JURISDICTION: A statutory authority can differ between countries. The term is used to refer to the governmental organization at the federal, national, state, or local entity having statutory authority to respond to, enforce, or prosecute laws. Examples are Customs, Judicial and Enforcement bodies.

AUTHORIZED DISTRIBUTION: Transactions conducted by an OCM-Authorized Distributor distributing product within the terms of an OCM contractual agreement. Contractual Agreement terms include, but are not limited to, distribution region, distribution products or lines, and warranty flow down from the OCM. Under this distribution, the distributor would be known as an Authorized Distributor. For the purposes in this Standard, Franchised Distribution is considered synonymous with Authorized Distribution.

AUTHORIZED (FRANCHISED) DISTRIBUTOR: Distributor when they perform Authorized Distribution.

AUTHORIZED SUPPLIER: Aftermarket Manufacturers, as defined above, and OCM-authorized sources of supply for a part (i.e., Franchised Distributors, Authorized Distributors). NOTE: Some Authorized Suppliers will provide other services which are not authorized by an OCM (e.g., independent distribution).

BROKER: In the independent distribution market, Brokers are professionally referred to as Independent Distributors. See definitions for “Broker Distributor” and “Independent Distributor.”

BROKER DISTRIBUTOR: A type of Independent Distributor that works in a “Just in Time” (JIT) environment. Customers contact the Broker Distributor with requirements identifying the part number, quantity, target price, and date required. The Broker Distributor searches the industry and locates parts that meet the target price and other Customer requirements. Broker distributors do not have contractual agreements or obligations with OCMs. (For reference only.)

BUSINESS PROCESS OUTSOURCING ORGANIZATION (BPO): An organization contracted by a customer to provide the operations and responsibilities of the customer’s specific business functions (or processes), e.g., including, but not limited to, procurement, logistics, etc.

CERTIFICATE OF CONFORMANCE (C of C, CoC): A document provided by a Supplier formally declaring that all buyer purchase order requirements have been met. The document may include information such as manufacturer, distributor, quantity, lot and/or date code, inspection date, etc., and is signed by a responsible party for the Supplier.

CERTIFICATE OF CONFORMANCE AND SUPPLY CHAIN TRACEABILITY (CoCT): A Certificate of Conformance required by certain military specifications which requires documented supply chain traceability from the Qualified Parts List/Qualified Manufacturers List (QPL/QML) manufacturer through delivery to a government agency if the material is not procured directly from the approved manufacturer.

CERTIFICATION: The Certification Body action of testifying, guaranteeing or endorsing organizations that conform with specific management systems standards.

CONTRACT ELECTRONICS MANUFACTURERS (CEM): An organization that produces goods using EEE parts, under the label or brand of another organization. CEMs provide such services to organizations based on their own or the customers' designs, formulas, and/or specifications.

DESTRUCTIVE PHYSICAL ANALYSIS (DPA): A systematic, logical, detailed examination of parts during various stages of physical disassembly, conducted on a sample of completed parts from a given lot, wherein parts are examined for a wide variety of design, workmanship, and/or processing problems. Information derived from DPA may be used to:

a. preclude installation of inauthentic parts or parts having patent or latent defects

b. aid in disposition of parts that exhibit anomalies

c. aid in defining improvements or changes in design, materials, or processes

d. evaluate Supplier production trends

DISPOSITION: Decisions made by authorized representatives within an Organization concerning future treatment of nonconforming material. Examples of dispositions are to scrap, use-as-is (normally accompanied by an approved variance/waiver), retest, rework, repair, or return-to-supplier.

ELECTRICAL, ELECTRONIC, AND ELECTROMECHANICAL (EEE) PART: Electrical, electronic, and electromechanical parts are components designed and built to perform specific functions, and are not subject to disassembly without destruction or impairment of design use. Examples of electrical parts include resistors, capacitors, inductors, transformers, and connectors. Electronic parts include active devices, such as monolithic microcircuits, hybrid microcircuits, diodes, and transistors. Electromechanical parts are devices that have electrical inputs with mechanical outputs, or mechanical inputs with electrical outputs, or combinations of each. Examples of electromechanical parts are motors, synchros, servos, and some relays

END USER: An organization that uses a product. For example, including but not limited to NASA, UK MoD, US DoD, etc.

FALSELY IDENTIFIED: Identified in an inaccurate manner with no implication as to whether the identification is intentional or inadvertent.

FIRMWARE: In electronic systems computing, firmware is the combination of read-only memory and program code and the data stored in it. Firmware is a software program or set of instructions programmed on a hardware device to provide instructions for how the device communicates with the other computer hardware.

FRANCHISED DISTRIBUTION: For the purposes in this Standard, Franchised Distribution is considered synonymous with Authorized Distribution (see “Authorized Distribution” definition above).

FRANCHISED DISTRIBUTOR: Also known as Authorized Distributor (see “Authorized (Franchised) Distributor” definition above).

HOMOGENEOUS LOT: A group of parts that:

a. are received in a single shipment (whether in single or multiple packages),

b. are marked or otherwise identified with identical lot, batch, run, and identification information (e.g., dates codes, lot codes),

c. are identical in appearance to the unaided eye (parts and packaging),

d. appear to have been subjected to the same handling, packaging, and/or storage conditions, and

e. have maintained their physical placement relative to each other (i.e., have never been separated based on evidence such as source, packaging, labeling).

INDEPENDENT DISTRIBUTOR: A distributor that purchases parts with the intention to sell and redistribute them back into the market. Purchased parts may be obtained from Original Equipment Manufacturers (OEMs) or Contract Manufacturers (typically from excess inventories), or from other Distributors (Franchised, Authorized, or Independent). Resale of the purchased parts (redistribution) may be to OEMs, Contract Manufacturers, or other Distributors. Independent Distributors do not normally have contractual agreements or obligations with OCMs. See definition of “Authorized (Franchised) Distributor.”

KNOWN AUTHENTIC PART: A part which has either been purchased directly from the manufacturer, their authorized distributors, or authenticated by the manufacturer with supporting documentation.

MAINTENANCE, REPAIR AND OVERHAUL (MRO): An organization that will retain or restore an item in or to a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial, and supervision actions. MRO often refers to civil aviation maintenance and Depot Level Maintenance often refers to military vehicle maintenance.

NONDESTRUCTIVE TESTING (NDT): Can also be described as Nondestructive Inspection (NDI) or Nondestructive Evaluation (NDE). NDT encompasses a wide variety of analytical techniques used in science and industry to evaluate the properties of materials, components, subcomponents, or systems without damaging or permanently altering them.

OPEN MARKET: The trading market that buys or consigns excess inventories of electronic parts and subsequently utilizes these inventories to ultimately fulfill the supply needs of an end user.

NOTE: The Open Market may include the purchase and sale of parts where the full supply chain traceability of such parts is unknown.

ORIGINAL COMPONENT MANUFACTURER (OCM): An entity that designs and/or engineers a part and is pursuing or has obtained the intellectual property rights to that part.

NOTES:

1. The part and/or its packaging are typically identified with the OCM's trademark.

2. OCMs may contract out manufacturing and/or distribution of their product.

3. Different OCMs may supply product for the same application or to a common specification.

ORIGINAL EQUIPMENT MANUFACTURER (OEM): A company that manufactures products that it has designed from purchased components and sells those products under the company's brand name.

PACKAGING (COMPONENT): Component packaging refers to the manner in which electronic parts are packaged in preparation for use by electronic assemblers. The determination of packaging types is determined by product sensitivities such as moisture, physical (lead pitch, co-planarity), electrostatic discharge (ESD), as well as the method (manually, or by use of automated equipment) to be used to place parts on the printed circuit board. There are four main types of packaging: bulk, trays, tubes, and tape and reel.

PART(S): One or more pieces joined together, which are not normally subject to disassembly without destruction or impairment of intended design use. For the purposes in this document, "part" is synonymous with "component".

PART, ACTIVE. An electronic component that contains semiconductor junctions. Examples of active parts include monolithic microcircuits (ICs), hybrid microcircuits, and semiconductor devices such as diodes, silicon controlled rectifiers, and transistors.

PART, PASSIVE. An electrical and/or electromechanical component that does not contain semiconductor junctions. Examples of passive electrical parts include resistors, capacitors, inductors, transformers, wire and cables, and connectors. Examples of passive electromechanical parts include motors, synchros, servos, and some relays.

PLATFORM INTEGRATOR: An organization authorized to manufacture a complex product. For example, including, but not limited to, Plane, Ship, Train or Power Station, etc. These complex products are often referred to as Platforms.

POPULATION: A collection of Homogenous Lots from which to draw statistical inferences.

REFINISHED: Using post-manufacture plating methods (such as solder dipping) to alter the plating composition on a part's leads.

REFURBISHED: Parts that have been renovated in an effort to restore them to a "like new" condition, e.g. leaded parts may have their leads realigned and re-tinned and subjected to cleaning agents and chemical processing.

REGISTRATION: The Certification Body action of entering a record or causing a record to be entered, as a result of certification.

STOCKING DISTRIBUTOR: A Distributor that stocks inventory.

SUPPLIER: Within the context of this document, a blanket description of all sources of supply for a part. Types of Suppliers include OCM, OEM, Authorized (Franchised) Distributor, Independent Distributor, Broker Distributor, Stocking Distributor, Aftermarket Manufacturer, Government Supply Depot, and 3PL Provider.

SUPPLY CHAIN TRACEABILITY: Documented evidence of a part's supply chain history. This refers to documentation of all supply chain intermediaries and significant handling transactions, such as from OCM to distributor, or from excess inventory to broker to distributor.

SUPPLY CHANNEL: The general category of Supplier, such as Open Market, OCM, Aftermarket Manufacturers, Authorized (Franchised) Distributor, 3PL Provider, Independent Distributor, Broker Distributor, OEM Surplus, etc.

SYSTEMS INTEGRATOR: An organization that specializes in bringing together component subsystems into a whole and ensuring that those subsystems function together.

THIRD-PARTY LOGISTICS (3PL) PROVIDERS: Firms which provide outsourced or "third party" logistics services to companies for supply chain management functions. 3PL Providers typically specialize in integrated operation, warehousing, and transportation services that can be scaled and customized to Customer's needs based on market conditions and the demands and delivery service requirements for their products and materials.

UNUSED (NEW SURPLUS): Electronic parts that have not been previously used (i.e., attached to a board or powered up since leaving the supply chain). A shipment of unused material can contain mixed date codes, lot codes, or countries of origin, and should be received in original factory or third party packaging. The material may have minor scratches or other physical defects as a result of handling, but the leads should be in good condition and should not be refurbished. The material should be guaranteed to meet the manufacturer's full specifications. Unused programmable parts should be received without having been previously programmed.

UNBROKEN CHAIN OF CUSTODY: Verifiable evidence of chronological documentation without gaps, showing the custody control, transfer, and traceability to the OCM or OEM.

NOTE: Co-mingling of parts is typically prevented by physically segregating segregation of parts

UPRATED: Assessment which results in the extension of a part's ratings to meet the performance requirements of an application in which the part is used outside the manufacturer's specification range.

UPSCREENED: Additional part testing performed to produce parts verified to specifications beyond the part manufacturer's operating parameters. Examples are Particle Impact Noise Detection (PIND) testing, temperature screening, Radiation Hardness Assurance testing, etc.

USED (REFURBISHED OR PULLED): Product that has been electrically charged and subsequently pulled or removed from a socket or other electronic application excluding electrical testing for acceptance. Used product may be received in non-standard packaging (i.e., bulk), and may contain mixed lots, date codes, be from different facilities, etc. Parts may have physical defects such as scratches, slightly bent leads, test dots, faded markings, chemical residue or other signs of use, but the leads should be intact. Used product may be sold with a limited warranty, and programmable parts may still contain partial or complete programming which could impact the part's functionality. Used parts marketed as refurbished shall be declared as such.

4. REQUIREMENTS

4.1 Fraudulent/Counterfeit EEE Parts Control Plan

The organization shall develop and implement a fraudulent/counterfeit EEE parts control plan that documents its processes used for risk mitigation, disposition, and reporting of suspect or confirmed fraudulent/counterfeit EEE parts and or assemblies containing such parts. The control plan shall include the processes described in 4.1.1 through 4.1.10.

4.1.1 Personnel Training

Relevant personnel, including management of programs, projects, procurement, quality assurance, inspection, receiving, manufacturing and engineering activities shall be trained as appropriate to their function, in the awareness, avoidance, detection, mitigation and disposition of suspect/fraudulent/counterfeit EEE parts.

4.1.2 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.

4.1.3 Purchasing Process

The processes shall:

a. Document the assessments criteria and assess potential sources of supply (including electronic parts, assembly, and equipment suppliers) to determine the risk of receiving fraudulent/counterfeit EEE parts. Maintain records for those suppliers which have met the criteria. Guidance: Appendix B.

b. Specify a preference to procure directly from OCMs or authorized suppliers who are identified by requirements [a] above. If it is disclosed that the source of supply is not authorized for the part(s) being quoted, these procurements shall be subject to the same requirements as those procured from a nonauthorized supplier.

   NOTE: Some Authorized Suppliers will provide other services which are not authorized by an OCM (e.g., independent distribution).

c. Assure that approved/ongoing sources of supply are maintaining effective processes for mitigating the risks of supplying fraudulent/counterfeit EEE parts. Guidance: Appendix B.

d. Require a documented risk assessment and risk mitigation plan, specific to the intended application, for each procurement other than from an OCM or authorized supplier.

4.1.4 Purchasing Information

The documented process shall specify contract/purchase order requirements to minimize the risk of being provided fraudulent/counterfeit EEE parts and at a minimum require:

a. Supply chain traceability to the OCM or aftermarket manufacturer that identifies the name and location of all of the supply chain intermediaries from the part manufacturer to the direct source of the product for the seller. If this supply chain traceability is unavailable or the documentation is suspected of being falsified, a documented risk assessment is required.

b. Specify flow down of applicable requirements of this document to applicable contractors and their sub-contractors. In the event that one or more supply chain intermediaries do not have a fraudulent/counterfeit part control plan compliant to this document, a risk analysis shall be required for every application of the part. Guidance: Appendix D.

c. Specify that disclosure is required, in writing, at the time of each individual quotation whether or not the source of supply is authorized (franchised) for the part(s) being quoted and whether or not is providing full manufacturer's warranty on the quoted part(s). Guidance: Appendix D.

4.1.5 Verification of Purchased/Returned Part(s)

The documented processes shall ensure:

a. Detection of suspect or confirmed fraudulent/counterfeit EEE parts prior to formal part acceptance. The rigor of the verification process shall be commensurate with product risk. Guidance: Appendix E.

b. The returns process specifies inspection to validate the authenticity of returned part(s). Guidance: Appendix E/F.

4.1.6 In-Process Investigation

The documented processes shall address the detection, verification, and control of in-process (post acceptance) and in-service suspect or confirmed fraudulent/counterfeit EEE parts.

4.1.7 Failure Analysis

When a failure analysis is conducted and the failure is isolated to a single part, the process shall determine and document whether or not a failure is due to a suspect fraudulent/counterfeit EEE part.

4.1.8 Material Control

The documented processes shall specify methods to:

a. Control excess and nonconforming parts to prevent them from entering the supply chain under fraudulent circumstances.

b. Control suspect or confirmed fraudulent/counterfeit EEE parts to preclude their use or reentry into the supply chain by physically identifying and segregating the parts from acceptable non-suspect parts and placing in quarantine. Quarantine shall consist of controlled access areas. Guidance: Appendix F.

4.1.9 Reporting

The documented processes shall assure that all occurrences of suspect or confirmed fraudulent/counterfeit EEE parts are reported, as appropriate, to internal organizations, customers, government reporting organizations, industry supported reporting programs, and authorities having jurisdiction. Guidance: Appendix G.

4.1.10 Post Delivery Support

The control plan shall describe the processes used to resolve nonconformance's related to suspect counterfeit or fraudulent EEE parts that may or have been used in product delivered to a customer. This shall include the investigation and reporting process.

5. NOTES

5.1 A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

PREPARED BY SAE COMMITTEE G-19, COUNTERFEIT ELECTRONIC PARTS

APPENDIX A - PARTS AVAILABILITY

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization.

A.1 DESIGN, PROPOSAL, AND PROGRAM PLANNING

During design, proposal and program planning efforts, organizations should assess the long term availability of authentic parts and part sources for production and support of systems. When assessments indicate availability risks, organizations should take the steps necessary to reduce exposure to fraudulent/counterfeit EEE parts, including, for example:

a. Lifetime or bridge buy

b. System redesign

c. Alternate/multiple sources

d. Substitutions

e. Planning for adequate procurement lead times

A.2 OBSOLESCENCE MANAGEMENT

Obsolescence can increase the risk of acquiring fraudulent/counterfeit EEE parts. To reduce the likelihood of purchasing fraudulent/counterfeit EEE parts, electronic equipment manufacturers should proactively manage the life cycle of their products through the use of an Obsolescence Management Plan or Diminishing Manufacturing Sources and Material Shortages (DMSMS) management plan.

The following Government and Industry documents provide guidance with regard to managing DMSMS:

a. SD-22: Department of Defense (DOD) Diminishing Manufacturing Sources and Material Shortages (DMSMS) Guidebook

b. GEIA GEB1: Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Practices, Government Electronics and Information Technology Association

c. EIA-4899: Standard for Preparing an Electronic Components Management Plan

d. IEC TS 62239: Process Management for Avionics - Preparation of an Electronic Components Management Plan

e. TechAmerica STD-0016, Standard for Preparing a DMSMS Management Plan

f. IEC 62402:2007: Obsolescence Management - Application Guide

g. MIL-STD-3018: Parts Management

h. MoD JSP886 The Defence Logistics Supply Chain Manual Volume 7 Integrated Logistics Support Part 8.13 Obsolescence Management

APPENDIX B - PURCHASING PROCESS

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization.

B.1 PROCUREMENT APPROACH

B.1.1 General

B.1.1.1 Electronic parts should be purchased, whenever possible, directly from OCMs or from authorized suppliers. Independent distributors should be used only after consideration of alternate parts, redesign, schedule adjustments and a reasonable search for material from authorized (franchised) sources has been conducted and approval has been obtained from a designated authority.

B.1.1.2 OCM franchise agreements typically include provisions that protect the user by ensuring product integrity and supply chain traceability, such as:

a. original manufacturer warranty.

b. proper handling, storage and shipping procedures.

c. failure analysis and corrective action support.

d. certificates of conformance and acquisition supply chain traceability.

Independent distributors do not have warranty or product support agreements with the OCM and, therefore, have limited means to ensure product integrity and supply chain traceability. Broker distributors, in particular, may only act as scouting agencies for hard-to-find parts and may not maintain quality assured inventories.

B.1.1.3 Authorized (Franchised) distributors should provide product acquired through franchise agreements with OCMs. When a distributor does not provide products in this manner, then for the purpose of this document, the distributor is considered an independent distributor for those products.

B.1.1.4 Procurement assurance processes for avoiding fraudulent/counterfeit product should begin prior to the tendering of a contract for the product. The extent of these processes should be commensurate with risks related to the source of supply and product criticality. Figure B1 depicts overall risk as a function of supplier reliability and product criticality. Figure B2 identifies factors for assessing and mitigating supplier risk.

B.1.2 Supplier Approval and Source Selection

B.1.2.1 Supplier approval and source selection considerations should include:

a. the buyer’s historical experience with the source.

b. previously documented problems noted by external sources. Guidance: Appendix G.

c. how long the source has been in business.

d. the source’s demonstrated adherence and/or certification to higher-level quality standards such as the following:

- assembly/equipment/system providers: AS9100

- OCMs, aftermarket manufacturers: AS9100, ISO 9001, AS9003

- distributors: AS9120, AS6081

- test facilities: ISO 9001

e. the source's demonstrated adherence to applicable provisions of SAE International Counterfeit Avoidance Standards.

f. the results of audits performed per B.1.3.

g. acceptable documented purchasing and product acceptance processes and practices for verifying the authenticity of parts supplied.

h. the use of outsourced and/or in-house laboratory testing.

i. use of quality inspectors that have been trained and qualified concerning types and means of electronic parts counterfeiting and how to conduct effective product authentication.

j. terms of the supplier warranty, return policy and product liability.

B.1.2.2 Buyers should ensure that independent distributors have established documented processes and the financial means to support any contractual guarantees expected. Purchase agreements should include product certifications and contractual remedies such as financial penalties if inaccuracies are found. For guidance see ARP6178.

B.1.2.3 Buyers should investigate independent distributors through reporting sources in advance of procurement activity to ensure suspect fraudulent/counterfeiting incidents have not occurred. Guidance: Appendix G.

B.1.2.4 An industry standard that can be used to help evaluate the suitability of an independent distributor is JEDEC Standard JESD31, General Requirements for Distributors of Commercial and Military Semiconductor Devices. JESD31 includes a number of provisions that protect the user by ensuring product integrity and supply chain traceability.

B.1.2.5 The cost of product inspections, tests, and supplier assurance actions (e.g., audits/surveys) should be factored into a determination of total procurement costs in order to fully evaluate and compare costs to be incurred by offerer proposals.

B.1.2.6 Figure B3 provides a procurement risk mitigation flow diagram.

B.1.3 Audits

B.1.3.1 Audits demonstrating that the supplier's quality management system incorporates adequate documented processes to prevent the purchase, acceptance, use, and delivery of fraudulent/counterfeit EEE parts should be performed before purchasing product, and periodically thereafter. (NOTE: Typical audit certifications apply to specific facilities, so multiple sites may require multiple audits.) These audits should occur at intervals sufficient to determine that the supplier's quality management system incorporates a program compliant with this Aerospace Standard (for equipment/system providers, where invoked), and/or other invoked contract requirements related to fraudulent/counterfeit parts risk mitigation. Audits may be performed by a qualified independent third party.

B.1.3.2 Using the results of audits performed by other private sector or Government organizations is an acceptable alternative to second or third party auditing provided the auditing process, attributes, and auditor qualifications are evaluated and deemed adequate to assure compliance with this document and/or other invoked requirements.

B.1.3.3 Audit scope and frequency should be commensurate with the assessed risk of the source. Audit requirements may range from completion of a survey assessment of the source's processes and controls (procurement, quality, handling, test, etc.), or a full facility audit of these processes.

B.2 When authorized suppliers provide services which are not authorized by an OCM (e.g., independent distribution), it is recommended the Organization clearly identifies the role in the transaction (by line item exception when they are not authorized) that the supplier provides (i.e., Authorized Supplier, Independent Distributor).

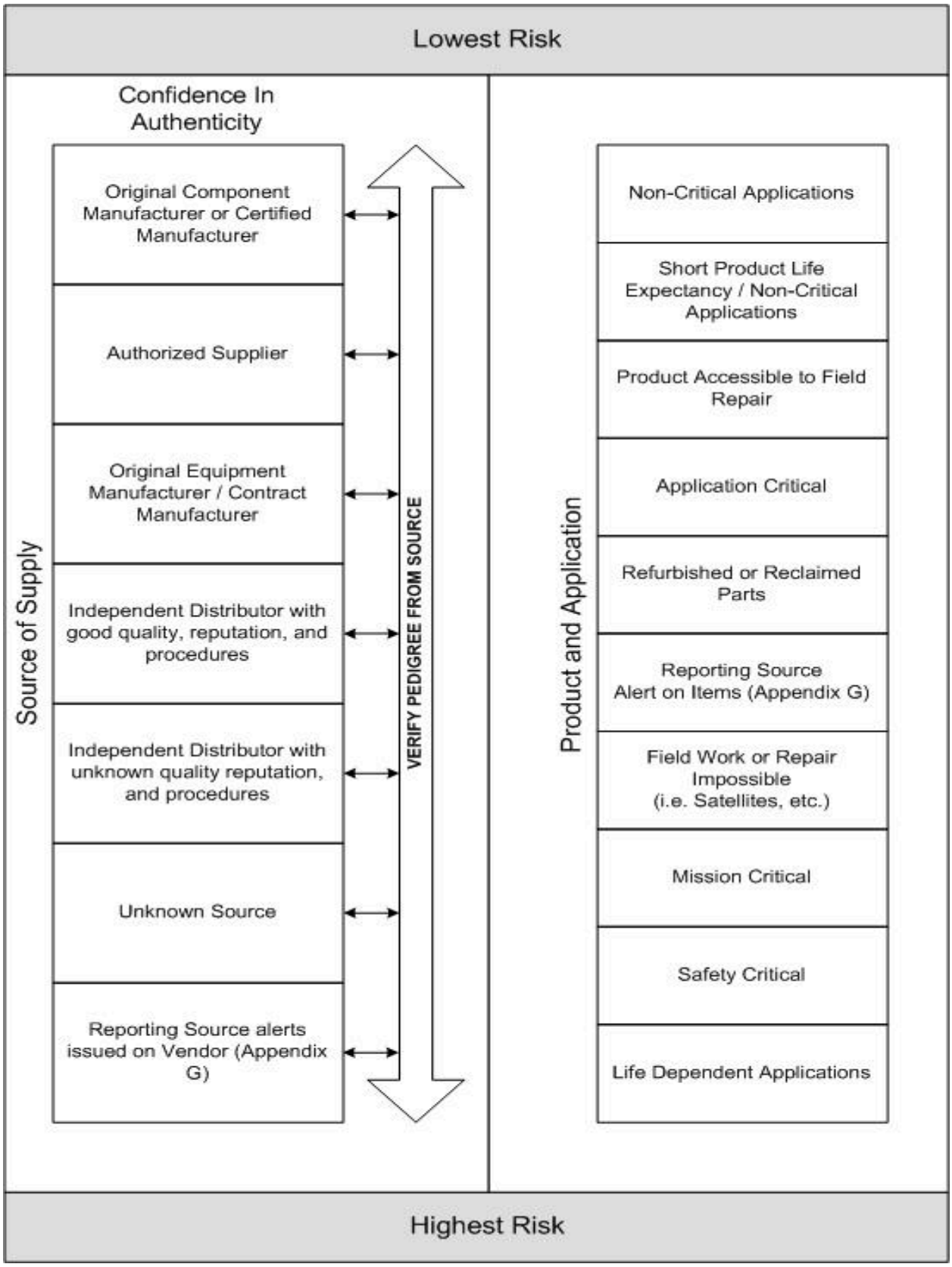

FIGURE B1 - RISK STACK CHART

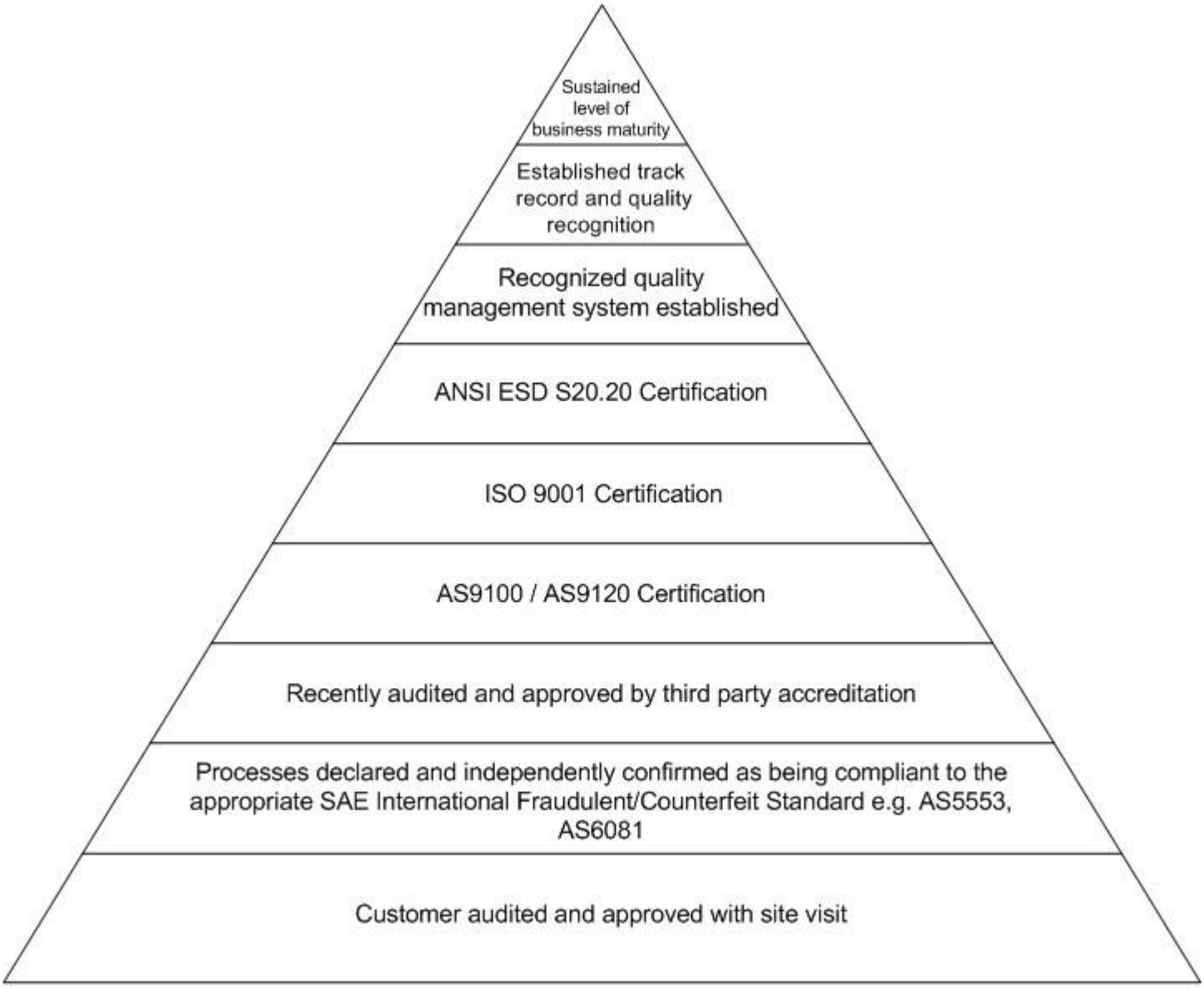

FIGURE B2 - SUPPLIER ASSESSMENT PYRAMID

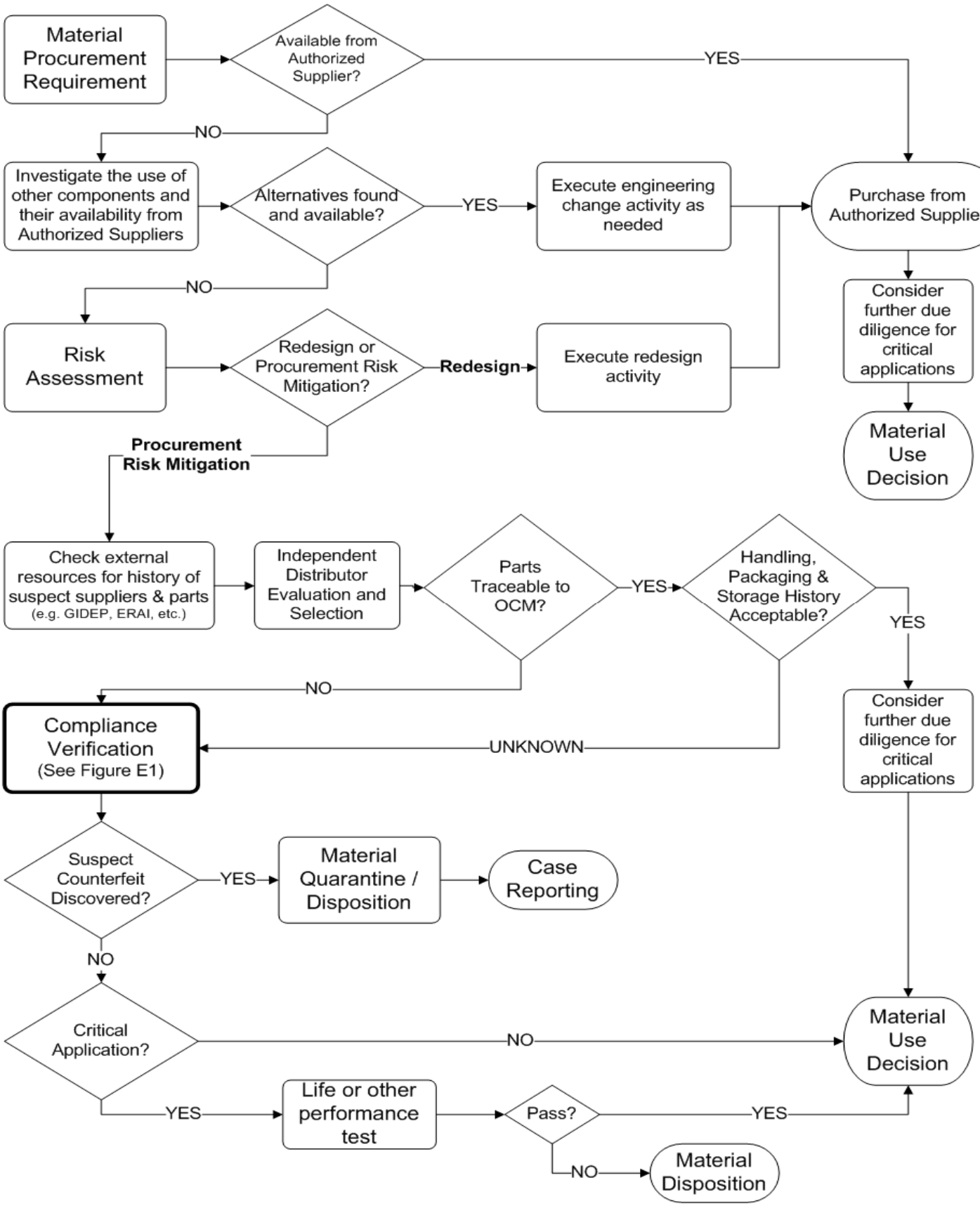

FIGURE B3 - PROCUREMENT RISK MITIGATION

APPENDIX C - SUPPLY CHAIN TRACEABILITY

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization.

C.1 OCMs and distributors (authorized (franchised) and independent) should be required to provide certificates of conformance and acquisition supply chain traceability; otherwise the purchaser assumes unknown risks. (NOTE: such documentation has the potential to be forged or falsified.) Acquisition supply chain traceability consists of the name and location of all supply chain intermediaries from the part manufacturer to the direct source of the product. The organization should ensure that these requirements are clearly stated as deliverable data within the procurement documents, regardless of which level of the supply chain provides the parts. If supply chain traceability is unknown or documentation is suspect, appropriate risk mitigation should be used as described in this document.

C.2 In order to assure supply chain traceability when parts are purchased through authorized (franchised) distribution, the documentation in the following paragraphs should be required.

C.2.1 For procurement of product for commercial or industrial use, product delivered by the manufacturer to the authorized (franchised) distributor is not normally required to contain a formal certificate of conformance. In such cases, the accompanying documentation is a commercially acceptable packing list. This document normally identifies the manufacturer, distributor to whom the parts were supplied, distributor purchase order number, part number, and quantity. Additional information, such as date code or statement of compliance, may be provided but is not normally required. This document is maintained on file by the distributor and not supplied to the end customer. Shipments of commercial and industrial parts are typically accompanied by a distributor packing list and/or certificate of conformance. Purchase orders should require that material purchased through authorized (franchised) distribution be acquired directly from OCMs or authorized suppliers.

C.2.2 For procurement of product for military (e.g., QPL/QML parts) use, a manufacturer certification to a specified military or aerospace specification or standard is required. This documentation should contain at a minimum the manufacturer, distributor, distributor purchase order number, part number, quantity, and date code of each quantity supplied. Additional information, as required by governing specifications, may also be provided. A copy of this document must accompany shipment of parts to the end customer and, for parts procured through authorized (franchised) distributors, must be accompanied by a certificate of conformance showing full supply chain traceability. Certification of conformance requirements are often contained within general military specifications (e.g., MIL-PRF-38535, MIL-PRF-19500, etc.).

C.3 While it is prudent to request independent distributors to provide these certificates of conformance and acquisition supply chain traceability, independent distributors often do not have this documentation. Supply chain traceability to the OCM may not have been maintained, is lost, or is unavailable. An independent distributor’s inability to provide certificates of conformance and acquisition supply chain traceability does not indicate wrongdoing or that the products offered are noncompliant, however, in these circumstances the procuring organization assumes unknown levels of risk regarding product authenticity and must take appropriate risk mitigation actions.

C.4 Examples of procurement clauses requiring certificates of conformance and supply chain traceability are provided in Appendix D of this Aerospace Standard.

APPENDIX D - PROCUREMENT CONTRACT EXAMPLES

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization. Legal counsel should be consulted prior to invoking in whole or in part any of the proposed contract requirements set forth in this Appendix.

D.1 CONTRACT REQUIREMENTS - GENERAL

The clauses provided in D.1.1, or substantially equivalent language, should be included in all contracts/purchase orders for electronic parts entered into by the Organization. They are intended to supplement, not duplicate or replace, requirements contained in other quality standards (e.g., ISO 9001, AS9100).

D.1.1 In order to minimize the risk of procuring fraudulent/counterfeit product, the buyer's procurement contract language should include requirements which will help ensure that conforming, authentic material is provided. The seller's responsibilities should be plainly stated and agreed upon, including:

a. Product supply chain traceability - Per Appendix C of this Aerospace Standard, the seller should be capable of providing full supply chain traceability for the parts being purchased, including names and addresses of prior sources (if any). Both buyer and seller should maintain records containing date and/or lot codes, and any serialization associated with the purchase order and invoice.

b. Tests and inspections - The seller should be notified by the customer of all tests and inspections that they will be required to perform to assure product authenticity, including development of accept/reject criteria and qualification of test/inspection personnel. The test facility should be approved by the customer and agreed to by the seller.

c. Quality management system - The seller should be required to comply with, and/or be certified to, an appropriate higher level quality standard (e.g., AS9100, AS9120, ISO 9001, and AS9003).

d. Acceptance of financial responsibility - The seller should be notified that they may be liable for remedial costs associated with provision of fraudulent/counterfeit product. Procurement contracts should state that the buyer is not under obligation to return suspect or confirmed fraudulent/counterfeit product. The buyer may request proof of financial responsibility, such as a product liability/completed operations certificate of insurance. The buyer may also request evidence of professional liability and/or product recall insurance with limits from the seller if the cost is commercially feasible for the seller.

e. Length of obligation - The seller should be informed of the specific time period for which their responsibility applies. Terms and conditions between buyer and seller should allow for a reasonable time period for the buyer to detect, quarantine, and confirm fraudulent/counterfeit or substandard product. The buyer should perform a level of inspection or test sufficient to detect gross or common indications of counterfeiting before the time expires.

f. Required documentation - The seller should be provided with clear and specific instructions concerning deliverable documentation. Documentation requirements, including certificates of conformance and test/inspection data, should be included in the contract terms and conditions.

g. Penalties associated with fraud - The seller should be notified of potential penalties associated with fraud and falsification.

D.1.2 The sample contract clauses provided in this appendix are intended to supplement, not duplicate or replace, quality clauses/requirements contained in other Aerospace Quality Standards such as AS9100, AS9120, and ARP9009. These documents should be referred to during the selection and development of comprehensive procurement contract requirements related to assuring product quality.

D.2 SAMPLE CONTRACT CLAUSES - CONTRACTS ISSUED TO ASSEMBLY/EQUIPMENT/SYSTEM PROVIDERS

D.2.1 Guarantee of Product Source(s)

“The seller shall ensure that only new and authentic materials are used in products delivered to <BUYER>. The Seller may only purchase parts directly from Original Component Manufacturers (OCMs), OCM authorized (franchised) distributors, or authorized aftermarket manufacturers. Use of product that was not provided by these sources is not authorized unless first approved in writing by <BUYER>. The seller must present compelling support for its request (e.g., OCM documentation that authenticates supply chain traceability of the parts to the OCM), and include in its request all actions to ensure the parts thus procured are authentic/conforming parts.”

“The Organization shall disclose in writing at the time of each individual quotation, the source of supply (by company name and location), whether or not the Organization is authorized (franchised) for the part(s) being quoted and whether or not providing full manufacturer’s warranty on the quoted material. If the Organization considers that the name of the source of supply is proprietary to the Organization, the Organization and Customer shall negotiate an appropriate non-disclosure agreement”.

D.2.2 Supply Chain Traceability

“The seller shall maintain a method of item supply chain traceability that ensures tracking of the supply chain back to the manufacturer of all Electrical, Electronic, and Electromechanical (EEE) parts included in assemblies and subassemblies being delivered per this contract. This supply chain traceability method shall clearly identify the name and location of all of the supply chain intermediaries from the manufacturer to the direct source of the product for the seller and shall include the manufacturer's batch identification for the item(s) such as date codes, lot codes, serializations, or other batch identifications.”

D.3 SAMPLE CONTRACT CLAUSES - CONTRACTS ISSUED OUTSIDE OF AUTHORIZED DISTRIBUTION (E.G., OPERATING IN THE OPEN MARKET, BROKER, BROKER DISTRIBUTOR, INDEPENDENT DISTRIBUTORS, STOCKING DISTRIBUTORS)

D.3.1 Test and Inspection Requirements

“The seller shall establish and implement test and inspection activities necessary to assure the authenticity of purchased product, in accordance to the requirements established by the customer, including:

- Supply chain traceability and documentation verification,
- Visual examination
- [see Appendix E of this Aerospace Standard for examples and descriptions of test and inspection activities]

Tests and inspections shall be performed in accordance with defined 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 EEE parts fraud and suspect counterfeiting and how to conduct effective product authentication.”

D.3.2 Supply Chain Traceability

“The seller shall maintain a method of item supply chain traceability that ensures tracking of the supply chain back to the manufacturer of all Electrical, Electronic, and Electromechanical (EEE) parts included in assemblies and subassemblies being delivered per this order. This supply chain traceability method shall clearly identify the name and location of all of the supply chain intermediaries from the manufacturer to the direct source of the product for the seller, and shall include the manufacturer's batch identification for the item(s) such as date codes, lot codes, serializations, or other batch identifications.”

D.3.3 Certificate of Conformance

“The seller shall supply full supply chain traceability including copies of Electrical, Electronic, and Electromechanical (EEE) part Manufacturer Certificates of Conformance (CoC).”

“The Manufacturer and the seller of its products shall complete a Certificate of Conformance (CoC) and full supply chain traceability for all parts.

a. The CofC supplied by the Manufacturer shall be copied and passed through to the end customer. The seller's certificate shall also accompany each shipment of product to the end customer. In no case shall the manufacturer’s certificate be altered or show signs of alteration.

b. The seller shall retain copies of certificates with the lot records until the lot is completely shipped.

c. The seller shall retain the product and shipment traceability for a period consistent with the contract requirements.

A Manufacturer’s CoC should include the following:

a. Manufacturer name and address

b. Manufacturer and/or buyer's full part number and part description.

c. Batch identification for the item(s) such as date codes, lot codes, serializations, or other batch identifications.

d. Signature or stamp with title of seller's authorized personnel signing the certificate.”

D.3.4 Quality Management System

“The seller shall have a quality management system that complies with *[ISO 9001 Quality Management Systems - Requirements, and when required, SAE International, AS9120 Quality Management Systems - Aerospace - Requirements for Aviation, Space and Defense Distributors or AS9100 Quality Management Systems – Requirements for Aviation, Space and Defense Organizations]*. Independent certification/registration is not required unless specified by the buyer.

Organizations that obtain certification/registration to ISO 9001 and when required AS9120 or AS9100 and subsequently change certification/registration bodies (CRB), lose registration status, or are put on notice of losing registration status, shall notify the buyer's procuring organization(s) within three days of receiving such notice from its CRB.”

D.3.5 Product Impoundment and Financial Responsibility

“If suspect or confirmed fraudulent/counterfeit EEE parts are furnished under this purchase agreement, such items shall be impounded. The seller shall promptly replace such items with items acceptable to the <BUYER> and the seller may be liable for all costs relating to impoundment, removal, and replacement. <BUYER> may turn such items over to the authority having jurisdiction (e.g., Office of Inspector General, Federal Bureau of Investigation, Ministry of Defence Police, HMRC, etc.) for investigation and reserves the right to withhold payment for the items pending the results of the investigation.”

APPENDIX E - PRODUCT ASSURANCE

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization. For further guidance see AS6081.

E.1 FRAUDULENT/COUNTERFEIT EEE PART DETECTION

For cases where procurements must be made from other than authorized suppliers, or there is reason to doubt a component's/part's authenticity, additional tests and inspections should be performed, as necessary, to detect EEE parts. The following mitigation methods can be applied to reduce the risk of receiving fraudulent/counterfeit EEE parts. These methods may not definitively distinguish authentic parts from fraudulent/counterfeit EEE parts, but when properly used will minimize the risk of fraudulent/counterfeit EEE parts entering the production system. For high risk applications, it may be necessary to perform life testing and other static, dynamic and functional testing as additional tests in order to attain the requisite confidence level. Questionable test results may require performance of comprehensive failure analysis.

This suite of tests and inspections is intended to supplement, not to replace, product acceptance procedures applied by the organization. It assumes that there is capability for a full set of tests. The risk stack chart provided in Figure E1 illustrates the concept of performing tests and inspections commensurate with product risk. Product risk is determined by supplier reliability and product criticality. The higher the product risk, the greater the sample size and the more definitive/invasive the testing techniques should be. Part risk may be re-evaluated after each test to determine if additional testing is required.

E.1.1 Documentation and Packaging Inspection

The supplier should provide an unbroken chain of contractual documentation (certifications, supply chain traceability information, manufacturer's datasheet, internal part specification, packing slips, etc.) tracing the movement of the parts back to the OCM, and certification that the parts have not been salvaged, reclaimed, otherwise used, or previously rejected for any reason.

Any Certificates of Conformance or other documentation should be examined for originality and applicability to the delivered material, including, but not limited to:

a. Lot and/or date codes on the packaging do not match the lot and/or date codes on the parts or is inconsistent with OCM Product Discontinuation Notices (PDNs).

b. Manufacturer's logo or label is absent, or does not match that shown on their website or on previous shipments.

c. Poor use of English, misspelled words, alterations, or changes to the documentation.

d. Barcode symbols do not match the human-readable printed part data.

e. Package materials are inconsistent with the description on the datasheet or otherwise indicate that the parts may not be new and authentic.

If there is an elevated concern for product integrity, it may be possible to verify with the OCM or Authorized (Franchised) Supplier that date, lot codes, reel sizes, and quantities listed on the documentation are valid.

E.1.2 Visual Inspection

External Visual Inspection is considered non-destructive. External Visual inspection, if properly performed, can lead to a high capture rate of suspect or fraudulent/counterfeit EEE parts. A good deal of fraudulent/counterfeits are parts that have been recycled, i.e., taken off boards or assemblies and reworked in the form of straightening and retinning the leads, remarking by sanding off the original marking, and blacktopping to hide the sanding marks and then remarking.

External Visual Inspection consists of the following two examinations, the first is to ensure that all parts in the lot meet the General Criteria below and appear in good condition to the unaided eye. The second examination is when samples are selected from the lot to undergo the Detailed Criteria below.

The General Visual examinations should be performed on 100% of incoming parts at a magnification appropriate to the attribute under examination. (NOTE: The Detailed examinations may be performed at an agreed to sample size. Some indicators of counterfeiting may not be detectable below 40X magnification.) IDEA-STD-1010, Acceptability of Electronic Components Distributed in the Open Market is one document that provides detailed guidelines for conducting visual inspection to detect fraudulent/counterfeit characteristics. Whenever possible, compare the sample being inspected to a part received from the OCM or OCM approved Authorized (Franchised) Distributor.

General Criteria

Verify the following:

1. Parts are received in a single shipment.
2. Parts are marked or otherwise identified with identical lot, batch, run, and identification information (e.g., date codes, lot codes, and serial numbers).
3. All parts are identical in appearance to the unaided eye (parts and packaging).
4. Parts appear to have been subjected to the same handling, packaging, and/or storage conditions.
5. Parts have maintained their physical placement relative to each other (i.e., have never been separated based on evidence such as source, packaging, labeling.

Detailed Criteria

The samples should be optically examined at a suitable magnification (3X minimum) and with suitable lighting. The magnification used will depend on the feature size that is being inspected. Anomalies may be an indication of suspect counterfeit parts.

A. Verify the following against the device specification or manufacturer’s datasheet:
    1. Number of pins per part
    2. Package type
    3. Part Dimensions
    4. Verify pin 1 placement in tape and reel (if applicable)

B. Lead Condition:
    1. Non-uniform color
    2. No Tooling marks
    3. No exposed copper on the ends of the leads
    4. Bent or nonplanar leads
    5. Excessive or uneven plating
    6. Missing Pins
    7. Discoloration, dirt, or residues on the leads

8. Scratches (or insertion marks) on the inside and outside faces of the leads
9. Gross Oxidation
10. Excessive solder on the leads
11. Non-uniform thickness

C. CGA Columns and BGA Ball Interconnects:

1. Discoloration, dirt, or residues on solder spheres or columns
2. Crushed or flattened BGA solder spheres
3. Misaligned columns
4. Discolored solder spheres or columns
5. Non-Uniform size and shape of solder spheres

D. Discrepant Markings can be signs of counterfeiting. Look for:

1. Different marking styles for parts with the same date/lot code
2. Different country of origin for parts with the same date/lot code
3. Different body molds for parts with the same date/lot code
4. Different backside markings for parts with the same date/lot code
5. Previous marking partially visible on the surface
6. If available, compare part logo(s) to a part received from the OCM or OCM approved Authorized (Franchised) Distributor.

E. Device Package Irregularities:

1. Uneven thickness of the packages
2. Dimples with uneven depth
3. Visible scratch marks or unidirectional abrasions
4. Significant package variation for parts with the same date/lot code
5. Differences in the corner radius between the top and bottom surfaces
6. Cracks or visible damage such as burn marks
7. Color discrepancy between the top and bottom of the part
8. Glue, adhesives, or other residues on the surface of the package
9. Evidence of color fade on the body of the part
10. Signs of corrosion on body of part or exposed areas of the lead-frame

F. BGA Packages Condition:

1. Solder Mask damage
2. Solder on exposed plating away from the solder spheres
3. Scratches in the mask that run underneath a solder sphere
4. Debris or residue between the solder spheres
5. Excessive Intermetallic Compound (IMC) Thickness
6. Constituents present in the IMC that are not possible due to the plating method used
7. Solder dross on the solder mask
8. Solder Mask touchup or repair

E.1.3 Inspection for Evidence of Remarking or Resurfacing

Inspection for Remarking and Resurfacing is considered to be destructive.

NOTE: Rework performed by the device manufacturer or by one of its authorized distributors with expressed permission of the manufacturer (e.g., Category B and C distributor per MIL-STD-790) for the purpose of remarking a device can be a manufacturer-authorized process. When such services are performed, records of such rework should be maintained and such devices should be supplied with manufacturer warranty. Authorized rework on devices will be permitted to the extent allowed by applicable governing specifications.

E.1.4 Solvent Test for Remarking

External visual may reveal evidence of remarking where the original marking was removed by chemical or mechanical means and the marking area was resurfaced or masked with a material that may or may not match the original surface. Any removal of the original surface finish, laser markings or ink markings is an indication the part may be fraudulent/counterfeit. This first test focuses on ink part markings and is a modified resistance-to-solvents test. To perform this test, mix a solution of three parts mineral spirits (CAS Registry Number 9072-35-9) with one part isopropyl alcohol (CAS Registry Number: 67-63-0). Dip a cotton swab into the solution, and wipe the swab across the markings on the part. The markings should not smear or be removed by the solution. However, more aggressive test methods that will also test for resurfacing reveal other indications that the original device marking has been removed. Mechanical scraping of the surface is sometimes successful at revealing this, but this technique is operator-dependent and often inconsistent.

E.1.5 Solvent Test for Resurfacing:

CAUTION: For all solvents specified in these tests, ensure proper safety precautions are used, including proper Personal Protective Equipment, a ventilated fume hood and eliminate any ignition sources.

This test focuses on the parts surfaces and is a sequence of three separate tests: (1) an Acetone (CAS Registry Number 67-64-1) Test, (2) a 1-Methyl 2-Pyrrolidinone (CAS Registry Number: 872-50-4) Test, and (3) a Dynasolve 750 (www.dynaloy.com), or equivalent) Test. Mechanical scraping of the surface is sometimes successful at revealing this, but this technique is operator-dependent and often inconsistent.

1. Acetone (CAS Registry Number 67-64-1) Test - The first test in the series is the Acetone test. To perform this test, dip a cotton swab into Acetone. The wipe the swab across the surface of the part (avoid markings if possible). If the swab turns black or if the section you wiped has a permanent color change, the part may be coated, and therefore considered suspect counterfeit.

2. Methyl 2-Pyrrolidinone test (CAS Registry Number: 872-50-4) - If the part passes the Acetone test, move on to the 1-Methyl 2-Pyrrolidinone test. When using 1-Methyl 2-Pyrrolidinone, completely immerse the part in the solution and heat it to 115 to 120 °C for 2 to 5 min (the time and temperature may be adjusted to compensate for your sample). Once the part is removed from the solution, use a cotton swab to wipe the coating off (avoid markings if possible). The removed coating will show on the cotton swab as black in color, and indicative of a suspect counterfeit part.

3. Dynasolve 750 (or equivalent) Test - If the part passes the Acetone and the 1-Methyl 2-Pyrrolidinone test (both are non-destruct tests), move on to the Dynasolve 750 test. Using a preheated solution of Dynasolve 750 at 105 °C, completely immerse the part in the solution for 45 min. Once the part is removed from the solution, use a cotton swab to wipe the coating off. The removed coating will show on the cotton swab as black in color. Also look for scratch marks on the surface of the removed coating. Either condition is indicative of a suspect counterfeit part.

E.1.6 Scanning Electron Microscope (SEM)

A SEM can produce very high-resolution images of a sample surface, revealing details less than 1 nm in size or about 250 times the magnification limit of the best light microscopes. The test is a form of visual test that compares the surfaces of a part within the lot being inspected and from the test lot against the virgin surface of a known authentic part of the same or proximate date and lot code, as available. The purpose is to reveal evidence of package resurfacing or marking removal, performed by microblasting. Microblasting is a micro abrasive jet machining technology that uses various types of fine (3 to 100 microns) abrasive particles to remove part marking and/or to resurface the package exterior. The inspection should be conducted at minimum 5000X to (1) compare surface characteristics to the virgin surface of a known authentic part of the same or proximate date and lot code, as available and (2) to detect the presence of abrasive particle media that ramdomly and invariably embeds itself into the softer surfaces of plastic encapsulated microcircuits (PEMs). Please note that the surface of ceramic and metallic packages is always changed with a microblasting process, but the inspection of embedded particles in ceramic or metallic package surfaces may be less definitive for these harder surfaces. Also note that the inspection for the presence of embedded abrasive particle media can be augmented with EDS/EDX element analysis. EDS/EDX testing is currently an alternate test for Lead Finish Evaluation herein.

E.1.7 Scanning Acoustic Microscopy (SAM) Inspection

SAM inspection should be performed on a representative sample from each homogeneous lot. SAM testing, including accept/reject criteria, should include the following as a minimum:

a. Surface scans of both the top and bottom component package surfaces to detect evidence of resurfacing or remarking. Evidence of resurfacing or remarking should require total lot rejection.

b. Interior top scans of the die, paddle, bond wires and lead frames to detect evidence of delamination, lead stress and contamination. Presence of lot sampling defects should require either total lot rejection or 100% testing of all parts in lot.

c. Overall calculations showing percentage of any die-voiding present. Presence of die-voiding should require overall percentage be calculated on each sampled component and reported to Customer for acceptance/rejection.

E.1.8 Radiological (X-ray Inspection)

X-ray inspection is considered to be non-destructive if the radiation exposure to the parts does not exceed the manufacturer’s specification. Parts that are exposed to radiation levels that exceed the manufacturer’s specification should not be returned to the lot after testing but may be used for subsequent destructive tests. Acceptable radiation levels may be validated prior to performing X-ray inspection.

Radiological inspection of electronics includes film radiography, digital radiography, and real time radiography. The penetrating radiation used for electronic inspection would be X-rays. Radiographic analysis by use of X-rays should be performed to verify that the internal package or die construction is consistent within the lot being inspected and versus OCM-supplied data and/or with a known authentic part of the same or proximate date and lot code as available. Analysis should compare die size, general shape, leadframe construction, wire bond gauge and routing.

Parts should be inspected for homogeneity, consistency, and uniformity. It is normal for there to be some variation across different date and lot codes, but not normally in parts with the same date and lot code. Radiographic films (or digital images) should be retained. If any anomalies are noted in the sample of the lot, 100% of the lot should be inspected with X-ray. Whenever possible, compare the sample being inspected to a part received from the OCM or OCM approved Authorized (Franchised) Distributor.

E.1.9 Lead Finish Evaluation (X-ray Spectroscopy - XRF or Energy Dispersive Spectroscopy - EDS/EDX)

The Lead Finish Evaluation with XRF is considered to be non-destructive. The Lead Finish Evaluation with EDS/EDX is considered to be destructive.

Lead finish evaluation should be performed by XRF or EDS/EDX to determine lot consistency compared to the manufacturer's data sheet and/or to confirm the presence or absence of lead (Pb) or other constituent elements Individual scan data should be retained. The initial method of detecting replated leads is the external visual inspection, not the lead finish evaluation. Lead Finish Evaluation is not considered a standalone test. It augments the findings of external visual inspection. During the external visual inspection, leads should be inspected for any finish abnormalities per the Detailed External Visual Examination criteria. This could include color variations, exposed copper on the ends of the leads, damaged leads, plating thickness variations, scratches and/or insertion marks, oxidation, corrosion, presence of solder and/or flux, etc. This evaluation should be performed prior to XRF/EDS/EDX lead finish evaluation. The subset of parts selected for the lead finish evaluation should not be randomly selected. They should be specifically chosen based on the visual inspection results and the sublots created based on that inspection and should include a representative sample from each variation observed during detailed external visual inspection. The sample size should be determined by the observed lead finish variations in the lot. The lead finish evaluation sample size should be three or 100% of a sublot, if less than three parts constitute a sub-lot for each finish variation observed during detailed external visual inspection.

E.1.10 Electrical Testing

Comprehensive electrical testing should be performed on all parts, across the full temperature range as per the parts' specification, in facilities with test equipment and test engineering expertise suitable for the specific part type. The acquiring activity should approve all test facilities and test methodologies. This test may be life limiting.

E.1.11 Burn-In

Pre Burn-In and Post Burn-In electrical testing should be performed on all parts using the criteria as defined in the applicable part specification. The steps involved in performing burn-in test are described below. This test may be life limiting.

a. Pre Burn-In Electrical Performance Testing - Parts should undergo comprehensive electrical testing to the applicable performance data sheet.

b. Burn-In - Parts (100%) should undergo a powered burn-in at the component's/part's maximum rated temperature.

c. Post Burn-In Electrical Performance Testing - Parts should undergo comprehensive electrical testing to the applicable performance data sheet.

E.1.12 Thermal Cycle Testing

Thermal cycling should be performed on 100% of the parts using the criteria as defined in the applicable part specification.

Upon completion of the required thermal cycles and a basic visual examination of the parts for evidence of marking deterioration or other physical damage, the parts should be electrically tested. This test may be life limiting.

E.1.13 Hermeticity Verification (Fine and Gross Leak)

Parts that are intended to be hermetic such as metal cans and ceramic packaged parts should undergo 100% fine and gross leak testing, as applicable.

E.1.14 Delid/Decapsulation Physical Analysis is Destructive

A representative sample of three parts minimum from each homogeneous lot should be delidded/decapsulated and examined for those parts for which a delidding/decapsulation is relevant for such a part type to verify that the die markings and internal package or die construction is consistent with a known authentic part, as available. Any discrepancies in die markings may be indicative of a fraudulent/counterfeit EEE part and should be resolved through communication with the OCM if possible. All die photos should be stored to the data retention requirements of the applicable quality management system and be easily accessible for future reference.

Each die should be optically examined at a suitable magnification (30X to 200X, typical). The required magnification will depend on die feature size and the process technology used. Die marking verification - All die markings should be documented (date, manufacturer, logos, mask set ID). When present, the die marking should be consistent with the manufacturer's data in the form of (1) data obtained directly from a known authentic part, (2) the Mask ID data found on the inspected chip uniquely matching the intended part (e.g., the examined Mask ID = the manufacturer's part number), or (3) OCM-supplied data. When die markings are not present, die layout and features should be compared between multiple samples, and in such cases should include comparison to a known authentic part. The presence of contamination, damage, defects, double (security) wire bonds are possible indicators of a fraudulent/counterfeit device and should be documented. This test may be destructive.

E.1.15 Destructive Physical Analysis (DPA)

DPA should be performed on a representative sample from each homogeneous lot. Representative sample sizes should be determined based on determination of product risk or contract requirements. This test may be destructive.

E.1.16 Other Tests

Other tests may be helpful in detecting fraudulent/counterfeit EEE parts.

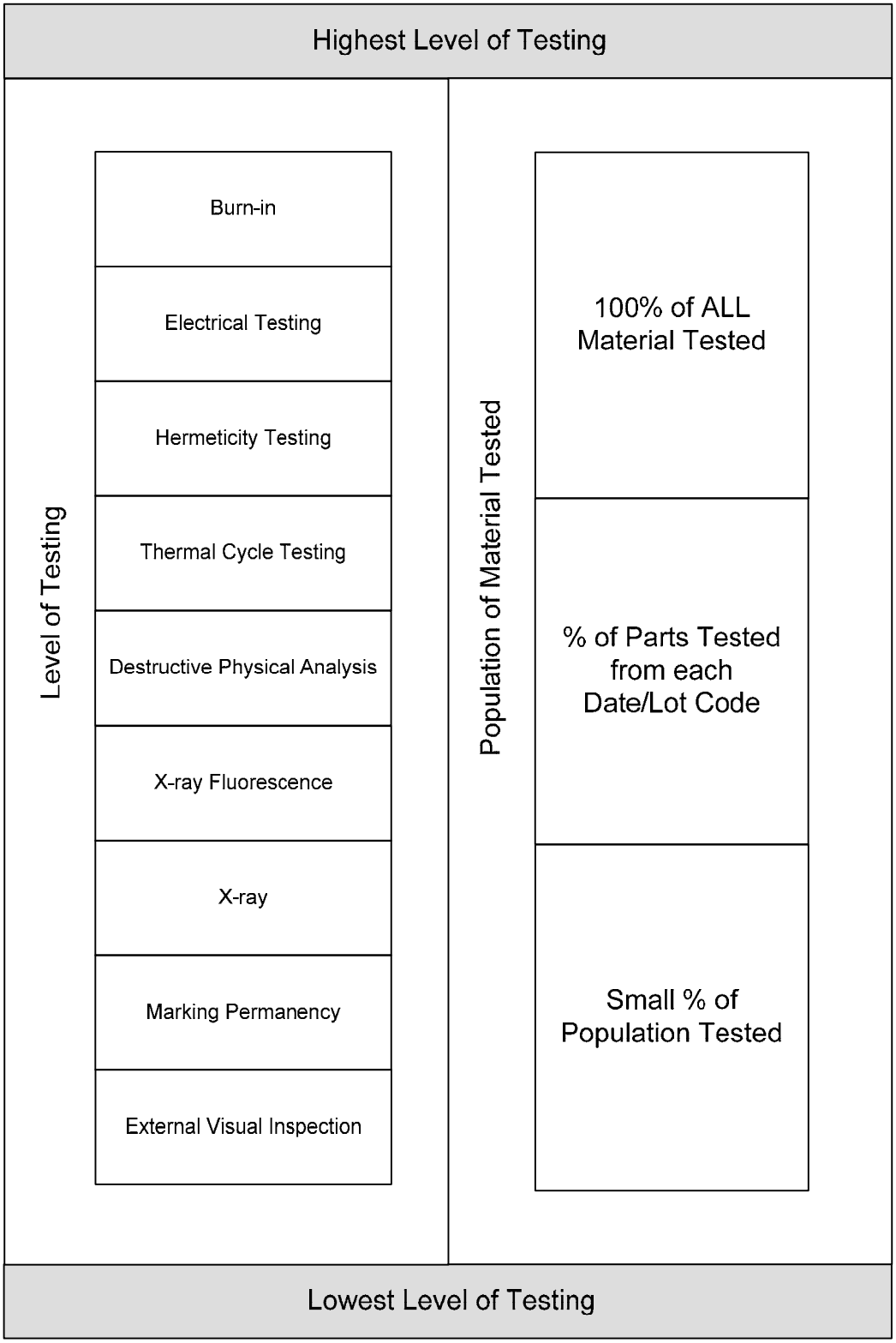

FIGURE E1 - TEST EVALUATION RISK STACK CHART

APPENDIX F - MATERIAL CONTROL

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization.

F.1 CONTROL OF SCRAP OR SURPLUS PARTS OR ASSEMBLIES

The Organization's documented procedure should define the responsibility and authority for the review and disposition of nonconforming product, and the process for approving personnel making these decisions.

NOTE: The term "nonconforming product" includes nonconforming product returned by a Customer, and suspect, fraudulent and/or counterfeit parts

F.1.1 Scrap Product

Electronic parts that have been found to be nonconforming or otherwise unsuitable for use should be physically identified (e.g., tag, label, mark), segregated from conforming material, and rendered unusable by physical destruction (e.g., grinding, breaking, or crushing) prior to disposal. Suspect fraudulent/counterfeit EEE parts should not be handled as scrap material. F.1.4 discusses the control of suspect or confirmed fraudulent/counterfeit EEE parts.

F.1.2 Surplus Product

Excess inventory or surplus parts originally procured for use in deliverable product should only be re-sold or dispositioned to external organizations with demonstrated adherence to higher level quality standards, this Aerospace Standard, and/or rigorous business, ethical, and quality standards intended to avoid acquiring and reselling fraudulent/counterfeit goods.

F.1.3 Return Product

In order to mitigate the risk of fraudulent/counterfeit EEE parts returning to the supply chain through supplier acceptance of returns, steps should be taken to permit supplier validation of authenticity. The request to return parts should include:

a. Part number to be returned

b. Name of manufacturer

c. Purchase order number under which parts were supplied

d. Quantity to be returned

e. Date/lot code of parts to be returned

f. Reason for return

Returns should not be made to suppliers without proper return material authorization. After receipt of return material authorization, the returned parts should include copies of the original paperwork.

F.1.4 Control of Suspect or Confirmed Fraudulent/Counterfeit EEE Parts

In the event that product assurance actions, in-process inspections/tests, or product failure experiences indicate that parts are suspect or confirmed fraudulent/counterfeit, the organization should deal with these types of nonconforming product by one or more of the following ways:

a. Physically identify the parts as suspect/fraudulent/counterfeit product (e.g., tag, label, mark).

b. Physically segregate the parts from acceptable non-suspect parts and place in quarantine. Quarantine should consist of physical barriers and controlled access.

c. Do not return the parts to the supplier for refund, replacement, etc., except under controlled conditions which would preclude resale of the suspect fraudulent/counterfeit EEE parts into the supply chain, and to allow the supplier to conduct internal investigation.

d. Confirm the authenticity of the parts. This may include further part-level testing, communications with the component's/part's supposed OCM, third-party analysis, etc.

e. Upon confirmation that a part is fraudulent/counterfeit, identify and place on "Hold" all potential additional fraudulent/counterfeit EEE parts in storage and installed in product pending disposition by appropriate authorities.

f. Report fraudulent/counterfeit EEE parts in accordance with guidelines provided in Appendix G.

APPENDIX G - REPORTING

The content of this Appendix is provided as guidance and can be invoked in whole or in part, by the policies, requirements or procedures of the Organization.

Upon identification of suspect or confirmed fraudulent/counterfeit parts, the Organization shall provide timely (within 60 days) notification to the reporting service organizations (as applicable) listed herein and to Authority Having Jurisdiction (as applicable).

Authority Having Jurisdiction, such as the agency Office of Inspector General (OIG), conducts independent criminal, civil and administrative investigations or audits that affect the servicing Governmental entity. Depending on the matter, Authority Having Jurisdiction coordinates with law enforcement agencies such as the U.S. Federal Bureau of Investigation (FBI) and U.S. Immigration and Customs Enforcement (ICE). Reports can be provided directly to Authority Having Jurisdiction points of contact, or via independent hotline reporting systems of the servicing Governmental entity. Table D1 provides reporting contact sources.

TABLE G1 - REPORTING CONTACT SOURCES

European Union (EU)	
	The European Commission has developed a Manual for Lodging of Applications for Customs Action, available at: http://ec.europa.eu/taxation_customs/resources/documents/customs_controls/counterfeit piracy/right holders/manual.en.pdf The manual includes a listing of national customs website for EU countries: Austria: http://www.bmf.gv.at/ Belgium: http://fiscus.fgov.be/interfdanl/ Bulgaria: http://www.customs.bg/ Cyprus: http://www.mof.gov.cy/ce Czech Republic: http://www.cs.mfcr.cz/ Denmark: http://www.skat.dk/ Estonia: http://www.customs.ee/ Finland: http://www.tulli.fi/ France: http://www.douane.gouv.fr/ Germany: http://www.ipr.zoll.de/ Greece: http://www.gsis.gov.gr/ Hungary: http://www.vam.hu/ Ireland: http://www.revenue.ie/ Italy: http://www.agenziadogane.it/ Latvia: http://www.vid.gov.lv/ Lithuania: http://www.cust.lt/ Luxembourg: http://www.etat.lu/DO/ Malta: http://mfin.gov.mt/ Netherlands: http://www.belastingdienst.nl/ Poland: http://www.clo.gov.pl/ Portugal: http://www.dgaiec.min-financas.pt/ Romania: http://www.customs.ro/ Slovak Republic: http://www.colnasprava.sk/ Slovenia: http://carina.gov.si/ Spain: http://www.agenciatributaria.es/ Sweden: http://www.tullverket.se/ United Kingdom: http://www.hmrc.gov.uk/

Russia	
	Department of Economic Security Department of the Interior of the Russian Federation (DEB Interior Ministry of Russia) The Department of Economic Security Department of the Interior of the Russian Federation is an independent structural unit of the central apparatus of the Interior Ministry, providing and performing the functions of the Ministry to develop and implement public policy and legal regulation of economic security, as well as performing other functions in accordance with the Regulations of the Department, regulations Affairs of Russia. A rights holder in Russia should report incidences of product counterfeiting to the Department of Economic Security, Russian Federation Ministry of the Interior. The Department is a specialized unit that also investigates financial fraud, financial support for terrorism, scams, currency counterfeiting, etc. The contact information is: By mail: 119049, Moscow, Zheetnaya Street 16 By telephone: 7(495)-667-68-67 Website: http://guebmvd.ru/ Product counterfeiting activities often involve cross border trade. The rights holder should also report crimes to the Russian Customs Service. Customs will then watch for suspicious goods at the border, but not on an unlimited time basis. The rights holder should also consider registering their TMs on the Custom's TM registry for customs, which then becomes part of the computerized database available at all customs posts. Customs officials will then be in a better position to intercept shipments of fake goods. The contact information is: By telephone: 7(495)-204-57-28 By fax: 7(495)-204-57-12 By email: umts_panfilova@mail.customs.ru or umts_kontakt@mail.customs.ru Website: http://www.russian-customs.org/

United Kingdom (UK)	
Crimestoppers	Contact Crimestoppers anonymously by calling +44 (0) 800 55 5111. Talking to one of our advisors helps you provide the full picture and makes sure the best use can be made of your information. By telephone: +44 (0) 800 55 5111 Website: http://www.fakesfundcrime.org.uk
HM Revenue and Customs	HM Revenue and Customs http://www.hmrc.gov.uk/index.htm Customs Hotline by telephone: +44 (0)800 59 5000
Intellectual Property Office Intel Hub	By mail: Intelligence Hub, Concept House, Cardiff Road, Newport, South Wales, NP10 8QQ By telephone: + 44 (0) 1633 814535 By email: ipintel@ipo.gsi.gov.uk Website: http://www.ipo.gov.uk
Ministry of Defence Police Fraud Squad	For issues relating to UK Defence. By mail: Head of Fraud Squad, MDPGA Wethersfield, Braintree, Essex. CM7 4AZ By telephone: + 44 (0) 1371 854203
Trading Standards Institute	To alert trading standards officers to the sale, purchase or production of counterfeit goods in the UK, the Trading Standards Institute disseminates any information received through its secure website TS Interlink. By email: information@tsi.org.uk By mail: Information centre, TSI 1 Sylvan Court, Sylvan Way Southfields Business Park Basildon Essex SS15 6TH Website: http://www.tradingstandards.gov.uk/
Anti-Counterfeiting Forum	The UK Electronics Alliance (UKEA) maintains a database of fraudulent/counterfeit items primarily for U.K. organizations. Data can be submitted by anyone on the public domain of their website (http://www.anticounterfeitingforum.org.uk/). Companies need to register on the website, which they may do free of charge, to report, view and comment online on fraudulent/counterfeit items. Submitting companies remain anonymous in the reporting of fraudulent/counterfeit items. All electronics-related companies/organizations are able to register. Registered users, and information uploaded to the database, are monitored on a regular basis to ensure correct use of this facility.

U.S.A.	
Air Force Office of Special Investigations (AFOSI)	AFOSI units are located at most Air Force bases worldwide. The AFOSI contact should be indicated in the installation's telephone directory. Or AFOSI can be contacted at 877-246-1453 for the phone number of the nearest AFOSI unit. AFOSI's email is hqafosi.watch@ogn.af.mil
Department of Commerce (DOC), Office of Inspector General (OIG)	By mail: U.S. Department of Commerce Office of Inspector General 1401 Constitution Avenue, NW Washington, DC 20230 Tel: (202) 482-4661 By telephone: HQ hotline 1-800-424-5197. By email: hotline@oig.doc.gov Online complaint form: http://www.oig.doc.gov/Pages/Hotline.aspx
Department of Energy (DOE), Office of Inspector General (OIG)	By mail: U.S. Department of Energy Office of Inspector General ATTN: IG Hotline 1000 Independence Avenue, SW Mail Stop 5D-031 Washington, DC 20585 By telephone: Inspector's General Fraud Hotline: 1-800- 541-1625 (toll free) or (202) 586-4073 (toll) By email: ighotline@hq.doe.gov
Department of Transportation (DOT), Office of Inspector General (OIG)	By mail: OIG Fraud Hotline 1200 New Jersey Avenue, SE West Bldg., 7th Floor Washington, DC 20590 By telephone: 1-800 424-9071 (toll free) By email: hotline@oig.dot.gov Online complaint form: https://www.oig.dot.gov/dot-oig-hotline-complaint-form

ERAI	ERAI is a privately held global trade association that monitors, investigates, reports, and mediates issues affecting the global supply chain of electronics, including supply of fraudulent/counterfeit and substandard parts. ERAI maintains a database of fraudulent/counterfeit and high-risk items. Data can be submitted by anyone on the public domain of their website (http://www.erai.com/). Companies do not need to be members to report fraudulent/counterfeit and high-risk items. Submitting companies remain anonymous in the reporting of fraudulent/counterfeit/high-risk items. Companies must be ERAI members to view this database. However, virtually all electronics-related companies/organizations, not just resellers, are candidates for membership. For further guidance, contact ERAI at (239-261-6268) or http://www.erai.com/
Excluded Parties List System (EPLS)	The Excluded Parties List System (EPLS) includes information regarding entities debarred, suspended, proposed for debarment, excluded or disqualified under the nonprocurement common rule, or otherwise declared ineligible from receiving Federal contracts, certain subcontracts, and certain Federal assistance and benefits. NOTE: EPLS and other systems is migrating to the System for Award Management (SAM). SAM is a free web site that consolidates the capabilities found in CCR/FedReg, ORCA, and EPLS. Registering with SAM will allow access to the full functionality of the system. See https://www.sam.gov/portal/public/SAM/ for additional information.
Federal Aviation Administration (FAA)	By mail: FAA Form 8120-11, “Suspected Unapproved Parts Report” Federal Aviation Administration Aviation Safety Hotline Office AAI-3, Room 840 800 Independence Avenue, SW Washington, DC 20591 By telephone: 1-800-255-1111 By email: FAA Form 8120-11 to: 9-awa-avs-aai-safetyhotline@faa.gov Online: FAA Form 8120-11 is available at: http://www.faa.gov/documentLibrary/media/form/faa8120-11.pdf

Government-Industry Data Exchange Program (GIDEP)	GIDEP (Government-Industry Data Exchange Program) is a cooperative activity between the U.S. Government, the Canadian Government, and Industry participants seeking to reduce or eliminate expenditures of resources by sharing technical information essential during research, design, development, production and operational phases of the life cycle of systems, facilities and equipment. GIDEP is the vehicle by which Industry and Government organizations alert each other of defective/nonconforming product, including fraudulent/counterfeit parts. GIDEP documents should be used by Government organizations and contractors to share information on counterfeiting issues. OMB Policy Letter 91-3 directs Executive Agencies and Establishments to participate in GIDEP. Contractors and suppliers should be members of GIDEP and have processes for monitoring GIDEP documents, responding to GIDEP documents, and reporting fraudulent/counterfeit parts issues to GIDEP. GIDEP participants should consult the GIDEP Operations Manual for guidance concerning participation in the program, reporting requirements, and procedures for the exchange of reports, data, and information. For additional guidance, go to the GIDEP member's website (http://www.gidep.org/). Non-participants may contact the GIDEP Help Desk (951-898-3207) for guidance.
IDEA	IDEA (Independent Distributors of Electronics Association) is a non-profit trade association representing Independent Distributors that have formally committed to adhere to prescribed quality and ethical standards. The stated purpose of IDEA is to promote the independent distribution industry through media advocacy; to improve the quality of products and services through a quality certification program, educational seminars and conferences; and to promote the study, development, and implementation of techniques and methods to improve the business of Independent Distributors. IDEA maintains a database of fraudulent/counterfeit and high-risk items. Data can be submitted by OCMs and members. For additional guidance, go to (http://www.idofea.org/).
NASA Office of Inspector General (NASA OIG)	By mail: NASA Office of Inspector General P.O. Box 23089 L'Enfant Plaza Station Washington, DC 20026 By telephone: 1-800-424-9183 By email: http://oig.nasa.gov/cyberhotline.html

National Intellectual Property Rights Coordination Center	The National Intellectual Property Rights Coordination Center (IPR Center) is the U.S. Government's clearing house for investigations into counterfeiting and piracy - crimes that threaten public health, public safety and fair competition. IPR Center Participants: • U.S. Immigration and Customs Enforcement • U.S. Customs and Border Protection • Federal Bureau of Investigation • Food and Drug Administration, Office of Criminal Investigations • U.S. Postal Inspection Service • Department of Commerce, International Trade Administration • U.S. Patent and Trademark Office • Naval Criminal Investigative Service • Defense Criminal Investigative Service • U.S. Army Criminal Investigative Command, Major Procurement Fraud Unit • U.S. General Services Administration Office of the Inspector General • Consumer Product Safety Commission • Defense Logistics Agency • U.S. Department of State, Office of International Intellectual Property Enforcement • INTERPOL • Government of Mexico Tax Administration Service • Royal Canadian Mounted Police In addition, the IPR Center works closely with the Department of Justice Computer Crime and Intellectual Property Section. By mail: Homeland Security Investigations National IPR Coordination Center 2451 Crystal Drive, STOP 5105 Arlington, VA 20598-5105 By telephone: 1-866-IPR-2060 By email: IPRCenter@dhs.gov Online: http://www.iprcenter.gov/

APPENDIX H - ACRONYMS AND ABBREVIATIONS

ACORD	Association for Cooperative Operations Research and Development
AFOSI	Air Force Office of Special Investigations
AIA	Aerospace Industries Association
ANSI	American National Standards Institute
ARP	Aerospace Recommended Practice
AS	SAE designation prefix for Aerospace Standard
ASSIST	Aquistion Streamiling and Standardization Information System
BGA	Ball Grid Array
CBP	U.S. Customs and Border Protection
CGA	Column Grid Array
CID	Criminal Investigation Division
CoC	Certificate of Conformance
CoC/T	Certificate of Conformance and Supply chain traceability
C of C	Certificate of Conformance
CRB	Certification/Registration Body
DAPS	Document Automation and Production Service
DCIS	Defense Criminal Investigative Service
DLA	Defense Logistics Agency
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DoC	Department of Commerce
DoD	Department of Defense
DoE	Department of Energy
DoT	Department of Transportation
DPA	Destructive Physical Analysis
DSCC	Defense Supply Center Columbus (predecessor organization to DLA and Maritime)
EEE	Electrical, Electronic and Electro-Mechanical
EIA	Electronic Industries Alliance
ERAI	ERAI, Inc
ESD	Electrostatic Sensitive Device or ElectroStatic Discharge
FAA	Federal Aviation Administration
FBI	Federal Bureau of Investigation
GEB	GEIA Engineering Bulletin
GEIA	Government Electronics and Information Technology Association
GIDEP	Government-Industry Data Exchange Program
HMRC	Her Majesty’s Revenuse and Customs
HQ	Headquarters
ICE	U.S. Immigration and Customs Enforcement
IDEA	Independent Distributors of Electronics Association
IEC	International Electrotechnical Commission
IP	Intellectual Property
IPR	Intellectual Property Rights
ISO	International Organization for Standardization
JEDEC	Joint Electronic Device Engineering Council
JESD	JEDEC Standard Document
JIT	Just In Time

MDA	Missile Defense Agency
MIL-PRF	Military Performance Specification
MIL-STD	Military Standard
NASA	National Aeronautics and Space Administration
NCIS	Naval Criminal Investigative Service
OCM	Original Component Manufacturer
OEM	Original Equipment Manufacturer
OIG	Office of Inspector General
OMB	Office of Management and Budget
PIND	Particle Impact Noise Detection
QAR	Quality Assurance Representative
QML	Qualified Manufacturers List
QPL	Qualified Products List
SAC	Special Agent in Charge
SD	DoD Defense Standardization Program Office prefix designation for Standard Document
STD	Standard
UKEA	UK Electronics Alliance
USACIDC	U.S. Army Criminal Investigation Command