

Counterfeit Electronic Part Detection and Avoidance Control (CEPDAC) Plan

1.0 Applicability & Scope

Battelle Corporate Office (hereinafter referred to as 'Battelle') codified this plan to minimize the risk of counterfeit Electronic Parts entering the supply chain. This plan outlines our approach for vetting suppliers of Electronic Parts or assemblies containing Electronic Parts, procuring these items, inspecting and testing them, and how to handle counterfeit and Suspect Counterfeit Electronic Parts. The preferred approach is to procure Electronic Parts directly from the Original Component Manufacturer or from their Authorized Suppliers.

In rare instances, due to availability or obsolescence, Battelle must procure Electronic Parts from other sources. In those instances, it is particularly important to follow a detailed, controlled process to minimize the risk of counterfeit Electronic Parts entering the for-delivery supply chain. The purpose of this plan is to outline the controls to mitigate the risk of counterfeit Electronic Parts.

Although only specifically required for contracts that include Defense Federal Acquisition Regulation Supplement (DFARS) clause 252.246-7007 "Contractor Counterfeit Electronic Part Detection and Avoidance System", Battelle recognizes that this risk is not unique to defense projects and has chosen to apply the practices outlined in this plan to all Electronic Parts procured as a direct charge to any contract or that may be used in a deliverable product (i.e., indirect inventory stock account).

2.0 Definitions

The following definitions are provided for use in the context of this plan. Some definitions have been extracted from DFARS 252.246-7007 Contractor Counterfeit Electronic Part Detection and Avoidance System (Aug 2016).

- **Authorized Aftermarket Manufacturer** - means an organization that fabricates an Electronic Part under a contract with, or with the express written authority of, the Original Component Manufacturer based on the Original Component Manufacturer's designs, formulas, and/or specifications.
- **Authorized Supplier** - an Original Equipment Manufacturer, an Original Component Manufacturer, or a supplier, distributor, or an Authorized Aftermarket Manufacturer with a contractual arrangement with, or the express written authority of, the Original Component Manufacturer, Original Equipment Manufacturer or current design activity to buy, stock, repackage, sell, or distribute the Electronic Part.



- **Contractor-Approved Supplier** - a supplier that does not have a contractual agreement with the Original Component Manufacturer or the Original Equipment Manufacturer for a transaction, but has been identified as trustworthy by a contractor or subcontractor.
- **Counterfeit Electronic Part** – an unlawful or unauthorized reproduction, substitution, or alteration **that has been knowingly mismarked, misidentified, or otherwise misrepresented** to be an authentic, unmodified Electronic Part from the Original Component Manufacturer or the Original Equipment Manufacturer, or a source with the express written authority of the Original Component Manufacturer or the Original Equipment Manufacturer or current design activity, including an Authorized Aftermarket Manufacturer. Unlawful or unauthorized substitution includes used Electronic Parts represented as new, or the false identification of grade, serial number, lot number, date code, or performance characteristics.
- **Electronic Part** – an integrated circuit, a discrete electronic component (including but not limited to, a transistor, capacitor, resistor, or diode), or an assembly containing an integrated circuit or a discrete electronic component.
- **GIDEP** – Government-Industry Data Exchange Program (GIDEP) is a cooperative activity between 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.
- **Original Component Manufacturer** - an organization that designs and/or engineers an Electronic Part and is entitled to any intellectual property rights to that Electronic Part.
- **Original Equipment Manufacturer** - a company that manufactures products that it has designed from purchased or fabricated components or materiel and sells those products under the company's brand name.
- **Suspect Counterfeit Electronic Part** - means an Electronic Part for which **credible evidence** (including, but not limited to, visual inspection or testing) provides reasonable doubt that the Electronic Part is authentic.

3.0 Responsibility

Employees with responsibilities for creating purchase requisitions, purchasing, receiving Electronic Parts, verifying Electronic Parts, and troubleshooting issues prior to shipment are responsible for compliance to this plan.

4.0 Policies

4.1 Governance of Battelle's Policies (DFARS Section C-10)

Battelle has established a Battelle Contract Research (CR) based technical council that will meet annually to discuss and identify any changes to our policies, this Plan, the CR process flow chart, the

centralized evaluation and disposition capability, and the Training, to ensure compliance with the DFARS, and to stay current with industry information and trends. While the membership of this council may change, at least one representative from each active Battelle Business Unit (BU), corporate Quality, and corporate Procurement at the King Avenue campus that works with Electronic Parts, shall be a member. Each member is responsible for identifying their BU staff required to be compliant to this Plan.

In addition, Battelle will leverage our Blazer Pkwy Manufacturing facility to be the centralized location for suspect counterfeit component evaluation and disposition. The Blazer Pkwy facility is equipped to quarantine, inventory, evaluate, and disposition Electronic Parts in accordance with this Plan.

4.2 Training of Personnel (DFARS Section C-1)

All staff required to be compliant to this Plan are required to take annual training in counterfeit electronic parts detection and avoidance. The training will be deployed via Battelle's Learning Management System.

4.3 Process to Abolish Counterfeit Parts Proliferation (DFARS Section C-3)

Battelle employs several methods to abolish proliferation of counterfeit Electronic Parts. The most effective method is prevention and is accomplished using the sourcing methodology set forth in Section 4.5.

A CR process flowchart has been developed for guidance, and can be found in Figure 1 below. Each Battelle BU, or remote Battelle location outside of the greater Columbus, OH region, may establish a superceding, modified version of the CR flowchart to reflect their unique processes based on business need, which requires review and approval by the CR council prior to release and adoption. The sections below provide additional policy guidance detail.

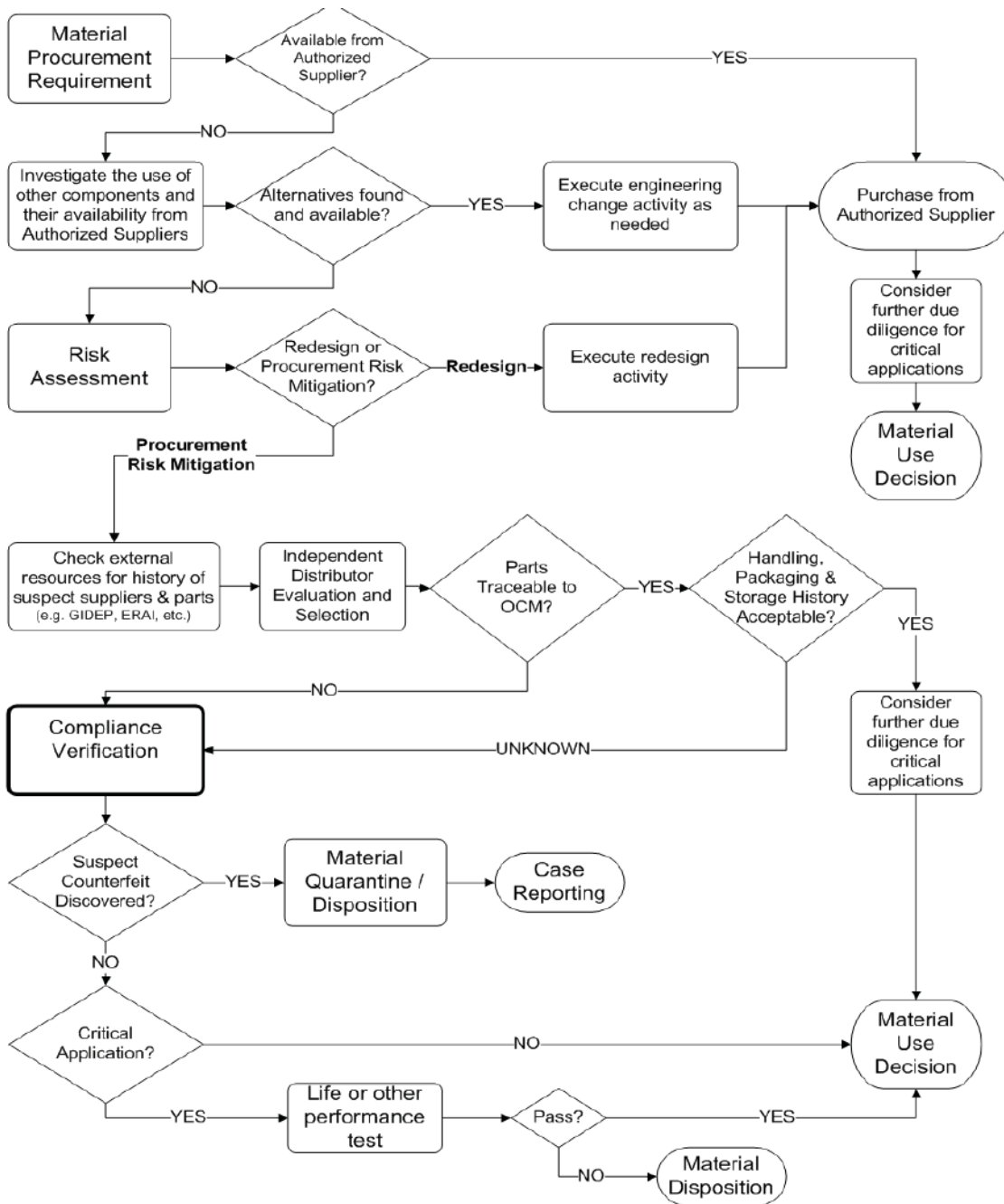


Figure 1: Procurement Risk Mitigation Process. Reprinted with permission Copyright © 2016 SAE International. Further distribution of this material is not permitted without prior permission from SAE. [1]

4.4 Traceability of Electronic Parts (DFARS Section C-4)

For purchases under United States Department of Defense (US DoD) contracts awarded to Cost Accounting Standard (CAS) covered prime contractors that contain DFARS clauses 252.246-7007 and

252.246-7008, these clauses are flowed down and suppliers are required to maintain traceability information and make it available to Battelle upon request.

Traceability of the specific lots to the end item is not maintained unless specifically required by the contract.

4.5 Supplier Selection and Approval (DFARS Sections C-5 and C-9)

As a primary protection against utilization of counterfeit Electronic Parts, Battelle, in general, pursues procurement from:

- 1) Original Component Manufacturers or Original Equipment Manufacturers
- 2) Authorized Aftermarket Manufacturer
- 3) Authorized Supplier
- 4) Contractor-Approved Supplier

Battelle may access the Electronic Components Industry Association (ECIA) website (www.eciaauthorized.com) to identify an Authorized Supplier or an Authorized Aftermarket Manufacturer. Battelle may also search the Original Component Manufacturers or Original Equipment Manufacturers websites or contact them directly to identify Authorized Suppliers or an Authorized Aftermarket Manufacturers.

The Government Industry Data Exchange Program (GIDEP) may also be searched to identify counterfeit or Suspect Counterfeit Electronic Parts.

In some situations, electronic parts may be purchased from other sources. The CR flowchart outlines these situations and the processes that should be followed. In the situation where a BU scenario is not covered, that particular BU is responsible for creating, maintaining, and controlling a modified version to address their business needs.

Purchase Orders and Subcontracts from Battelle issued under US DoD contracts awarded to Cost Accounting Standards (CAS) covered prime contractors containing DFARS clauses 252.246-7007 and 252.246-7008 flow down these clauses. The terms and conditions require suppliers to procure Electronic Parts as specified and in compliance with both DFARS clauses. If Electronic Parts must be procured from a supplier-approved source (i.e., under the auspices of Contractor-Approved Supplier as defined the DFARS clauses), Battelle may oversee, approve and monitor the process and tests used to verify authenticity, depending on the degree of risk.

Suppliers are evaluated for compliance with DFARS flow down requirements during the supplier qualification process, and may be added to an Approved Supplier List for specific Bill of Material (BOM) items.

If the supplier will not accept flow down of DFARS clauses 252.246-7007 and 252.246-7008 under US DoD contracts awarded to CAS covered prime contractors and reasonable alternatives do not exist, Battelle will notify the Government Procuring Contracting Officer in accordance with paragraph 3(ii) of 252.246-7008. The Government Procuring Contracting Officer will also be notified if inventory has been comingled with used, refurbished, reclaimed, or returned Electronic Parts or if there is reason to believe the component is not new and unused.

Counterfeit Electronic Parts or Suspect Counterfeit Electronic Parts may be intentionally acquired on a limited basis for their specific use (immediate need, research, specific features, etc.) based on a BU need. The BU modified flowchart should outline this scenario, and include the necessary authorization and control steps to prevent Counterfeit Electronic Parts or Suspect Counterfeit Electronic Parts from entering an unrelated product supply chain.

4.6 Evaluation of Purchased Electronic Parts (DFARS Section C-2)

Any purchase of Electronic Parts must be evaluated prior to assembly into deliverable products based on several risk factors. Table 1 below contains guidance criteria to evaluate the perceived risk of a specific electronic part. The results support establishment of countermeasures to minimize the overall risk of the procurement to an acceptable level based on the specific circumstances and application.

Battelle may also test utilizing Battelle Barricade™ (or similarly developed Battelle products), which utilizes power analysis to compare an unknown device to a known reference signature to determine authenticity of an electronic component.

If at any time during the evaluation of the Questionable Origin Electronic Part a counterfeit is suspected, Section 4.6 addresses the steps to properly contain and report in order to mitigate potential risk of non-conformance.

	OCM/OEM Test Data Available?	OCM/OEM CofC w/traceability Available?	Part Marking Condition (Visual)	Overall Part Condition (Visual)	Part Criticality for Human Safety	Part Availability
High Risk >>	No	No	Incorrect/ Not resistant to Solvent	Gross Degredation/ Evidence of Installation	High	Low
Medium Risk >>	No	No	Correct but faded/ suspect	Slight Degredation (e.g. Leads slightly bent)	Moderate	Moderate
Low Risk >>	Yes	Yes	Correct and Distinct	New (No degredation)	Low	High

Table 1

– Risk Assessment Guidance

4.7 Reporting and Quarantining of Suspect Counterfeit Electronic Parts (DFARS Section C-6)

In the event that a Suspect Counterfeit Electronic Part or a confirmed counterfeit Electronic Part is identified, Battelle quarantines the Electronic Parts to prevent assembly into deliverable products. These parts shall immediately be collected and tagged for quarantine, evaluation, and disposition by

the centralized capability at the Blazer Pkwy facility. Battelle also determines the most likely earliest use by tracing back from available data to include traceability data from suppliers.

After conclusion of appropriate analysis if the item is confirmed to be a counterfeit Electronic Part or remains a Suspect Counterfeit Electronic Part, then the following additional actions are pursued:

- The responsible individual, defined in the flow diagram and associated RACI chart, uploads the relevant facts to GIDEP;
- Battelle's Procurement Department notifies the supplier, seeks a credit for the amount paid (or cancellation of invoice), and does not return the Electronic Part to the supplier;
- If the confirmed or Suspect Counterfeit Electronic Part was included in a deliverable product under a US DoD contract that contains DFARS clause 252.246-7007 awarded to a CAS covered prime contractor, Battelle's Contracts Department notifies the Government Procuring Contracting Officer as specified in the clause. In addition, Battelle normally communicates with any type of customer, including commercial client customers, if the integrity of any deliverable is suspect; and
- Depending on the nature of the facts, Battelle may also contact the Intellectual Property Section of the Department of Justice.

The quarantine is released upon determination of authenticity. Electronic Parts that are confirmed to be counterfeit or remain Suspect Counterfeit Electronic Part are retained for potential use as evidence until the issue is resolved with involved parties. Upon resolution, the Electronic Parts are then destroyed by appropriate methods (i.e.: grinding, shredding, etc.) to ensure they will not be reinserted into the supply chain.

4.8 Methods to Identify Suspect Counterfeit Electronic Parts (DFARS Sections C-7 and C-8)

Battelle may use a variety of equipment and methods to identify Suspect Counterfeit Electronic Parts. The CR (or BU developed) flow chart includes the minimum required methods for evaluation. Table 2 below provides an overview of methodologies and indicators for evaluating components, and Table 3 for assemblies, for guidance.

Inspections and Tests

Test/Inspection	Destructive	Test Difficulty	Test Value	Useful for	Indicators	Comments
Documentation Check	No	Low	High	All parts	Spelling and grammatical errors, inaccuracies, omissions	See IDEA-STD-1010
Bar Code Check	No	Low	Med	All parts	Discrepancy between bar code label and human readable label	Used to identify fake packaging. Refer to IDEA-STD-1010 10.1.5.1-10.1.5.3
Carton Inspection	No	Low	Med	All parts	Carton damage, tampering, inadequate seals	See IDEA-STD-1010 10.1.5.1 - 10.1.5.3
Carrier Inspection	No	Low	Med	All parts	Orientation of parts varies, quantity varies, empty pockets	See IDEA-STD-1010 Section 10.1.5.4
Visual Inspection	No	Med	High	All parts	inconsistencies in appearance, poor quality, defects, multiple lot date codes	For detecting used, refurbished, or remarked parts
Marking Permanency (Mineral Spirits and Alcohol)	No	Low	High	IC and other marked plastic, ceramic, and metal packaged components	Removal of ink marking	For detecting remarked parts (Refer to MIL-STD-883, Method 2015 solution a)
Surface Finish Permanency (Acetone)	Yes	Low	High	IC and other marked plastic, ceramic, and metal packaged components	Removal of coating from part, sanding marks. Removal of ink marking is not a cause for rejection	For detecting blacktopped parts. Refer to IDEA-STD-1010
Surface Finish Permanency (Other)	Yes	Med	High	IC and other marked plastic, ceramic, and metal packaged components	Removal of coating from part, sanding marks. Removal of ink marking is not a cause for rejection	For detecting blacktopped parts (Heated Aggressive Solvent, e.g. Dynasolve)
Mechanical Inspection	No	Med	Med	All parts	Variation in package dimensions from manufacturer specification	See IDEA-STD-1010 Section 10.3.3
X-Ray Fluorescence (Radiological)	No	Med	Med	Components requiring tin-lead plating terminations	Finishes not compliant with the part specification (primarily lead (pb) content)	For detecting retinned or remarked parts
X-Ray (Radiological)	No	Med	High	Components with a die, leadframe, or other internally identifiable component	Inconsistent die size or leadframe	For detecting incorrect die or wrong parts
Scanning Acoustic Microscopy (SAM)	No	High	High	Plastic encapsulated components	Evidence of thermal stress (delamination)	For detecting signs of uncontrolled thermal stress damage or partially sanded part markings
Die Verification	Yes	High	High	Components with a semiconductor	Inconsistent die markings or disagreement with known good part	For detecting incorrect die or wrong parts

Table 2 – Evaluation Methodologies and Indicators Guidance

Equipment Type	Where Used	Purpose
Automated Optical Inspection (AOI)	Custom Circuit Card Assemblies (CCA)	Compares an image of a CCA to an image of a known-good CCA. Identifies differences in part markings, part location, polarity, some soldering issues
In-Circuit Test (ICT)	Custom Circuit Card Assemblies (CCA)	Electrically tests a board to check for proper electrical part function and shorts
Functional Testers	Assemblies	Verify product meets functional requirements at various points within the process
Environmental Stress Screening	Assemblies	Subjects assemblies to defined stress cycles to identify early life failures

Table 3 – Evaluation of Assemblies Guidance

4.9 Process for Screening GIDEP (DFARS Section C-11)

GIDEP contains information on equipment, Electronic Parts, and assemblies which are suspected to be counterfeit or have had other issues to be concerned about, such as premature failure. Battelle is a member of GIDEP, and the CR process flow chart indicates when GIDEP should be utilized, both for screening for known suspect counterfeit parts, but also when Battelle identifies a suspect counterfeit part.

4.10 Mitigation of Obsolete Electronic Parts (DFARS Section C-12)

Obsolescence occurs when an Electronic Part is no longer available from the Original Component Manufacturer or the Original Equipment Manufacturer or an Authorized Aftermarket Manufacturer. Business Units may maintain systems to actively manage component obsolescence. An example is SiliconExpert which has a PartSearch Tool to search 300 million parts for obsolescence forecasts plus a BOM Manager that provides alerts for BOM components. It is an online subscription based software tool to proactively identify component issues due to electronics industry changes, as well as continuously monitoring the component availability throughout the production lifecycle.

Obsolescence issues are reviewed with the design authority of the BU and their customer to make decisions to mitigate risk. Some options include last time buys, identification of alternate components, and potentially redesign. The BU shall appropriately modify the CR flow chart, or develop another means to mitigate the use of obsolete parts, to meet their specific business needs.

4.11 Purchasing

The CR flow chart identifies that process that should be followed to procure electronic components. As stated earlier, each BU may establish a modified version of the CR flow chart to reflect their unique purchasing processes based on business need.

When following BU-specific purchasing processes, purchasing Electronic Parts through Battelle’s eProcurement system, commonly referred to as punch-out, is authorized and encouraged. Suppliers available within the system have all signed legal agreements that contain appropriate counterfeit language and prohibited items are already blocked.

Battelle has adopted a protocol of abstaining from using Purchasing Credit Cards (PCards) for the acquisition of Electronic Parts or assemblies containing Electronic Parts as a direct charge to any client contract (including commercial clients) or to an indirect account where the Electronic Parts could be included in a deliverable. Likewise, Battelle employees are prohibited from using their travel credit cards or to otherwise seek reimbursement through Accounts Payable to purchase Electronic Parts or assemblies containing Electronic Parts as a direct charge to any client contract (including commercial clients) or to an indirect account where the Electronic Parts could be included in a deliverable.

In certain instances, an exception to the above may be necessary. The BU-specific flow charts shall also cover other situations that regularly arise, if they are not covered in the CR flow chart.

Bibliography

- [1] S. International, *Aerospace Recommended Practice ARP6328: Guideline for Development of Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition System*, SAE international, 2016.