ncidents of counterfeit parts in the electronics industry more than doubled between 2005 and 2008, according to the Aerospace Industries Association (AIA), which is urging action to reduce the associated risks in the aviation industry.

The AIA, in a report released in March, cited a 2010 study by the Bureau of Industry and Security (BIS) in the U.S. Department of Commerce that found more than 8,000 incidents of counterfeit parts in the U.S. electronics industry in 2008, compared with 3,300 incidents in 2005.[1]

"This sharp increase in incidents, in only three years, clearly indicates that the volume of counterfeit parts is increasing and mitigation plans must be developed and implemented," the report said.
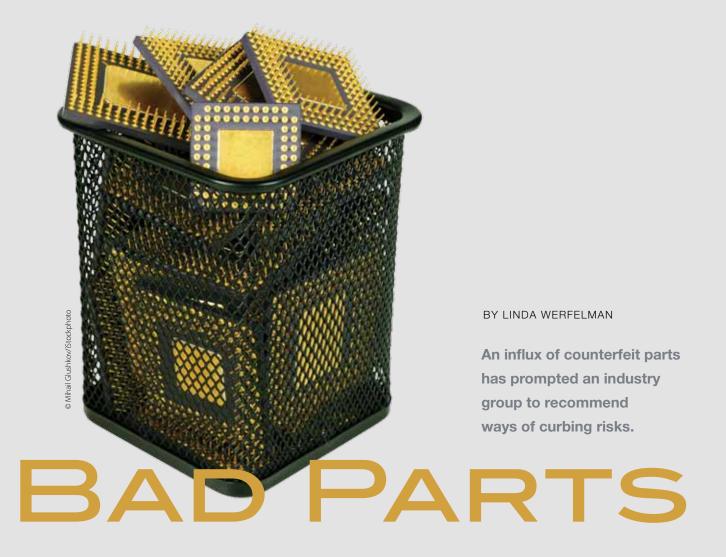
"Regardless of how counterfeit parts — whether electronic, mechanical or other — enter the aerospace and defense supply chain, they can jeopardize the performance, reliability and safety of aerospace and defense products. Authentic parts have known performance histories and adhere to the manufacturers' quality control plans, whereas counterfeit parts have unknown performance reliability and, often, limited quality controls."

The report identified "unique conditions" — in addition to profit — that have contributed to the counterfeiting of aerospace products, including the long life cycles of aircraft. As an example, the report cited the Boeing 737, which entered service in 1968; its retirement date has not been determined.

The decreasing numbers of component manufacturers and issues involving shortages of materials also play a role in the production of counterfeit parts, the report said.

During an aircraft's long life cycle, technologies change — especially technologies involving microchips and other electronic components, the report said.

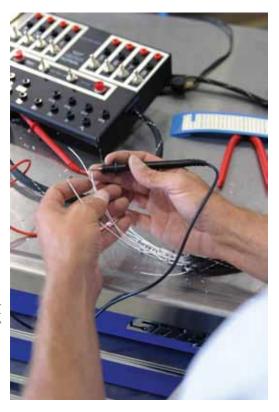"Currently, during the design, production and service life of an aircraft,

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BY LINDA WERFELMAN

An influx of counterfeit parts has prompted an industry group to recommend ways of curbing risks.

Bad Parts

the computers used to design and support it will change nine or more times," the report said. "The software used to design and support … the aircraft and the infrastructure used to store, transmit [and] receive information and communications will all change three times or more. Manufacturing processes used to assemble the aircraft will change two or more times, and the system[s] and subsystems used in the aircraft will change nine or more times."

As a result, these aircraft sometimes need parts that may no longer be available from the original manufacturer or other authorized manufacturer, distributor or reseller, the report said.

"When parts and materials, such as microcircuits, are acquired through distribution channels other than those franchised or authorized by the original manufacturer, such as an independent distributor or broker, there is the potential to receive parts that do not meet the original specifications," the report said.

In these situations, an electronic part could be "a fake non-working product," a new product labeled as being of a higher grade or an invalid part, the report said, citing the BIS study.

Although the aerospace industry accounts for less than 1 percent of the world's semiconductor market, counterfeit electronic parts present risks to safety, the report said, adding, "This lack of leverage for electronic parts makes the necessary task of mitigating risks difficult and expensive."

The AIA, in the aftermath of a series of meetings on the subject that began in 2007, recommended that the industry adopt procedures described by SAE Aerospace

Companies should develop plans for disposing of known or suspected counterfeit parts.

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Standard AS5553, which outlines steps for reducing counterfeit electronic parts in the supply chain. The steps are used by the U.S. Department of Defense and the National Aeronautics and Space Administration, the report said.

The AIA also recommended that the aviation industry develop purchasing processes aimed at reducing the likelihood of acquiring counterfeit parts. The association called for development of a qualified suppliers list for distributors (QSLD), which would include only distributors that had undergone a quality process assessment to verify that they had "the necessary processes in place to be able to mitigate the risk of receiving, storing and shipping potential counterfeit devices," the AIA said.

Other AIA recommendations called for distributors to maintain easily accessible records to allow the history of their components to be traced to the original manufacturer.

Reporting Processes

Although the reporting of counterfeit components is crucial, companies sometimes do not consistently report their discoveries to those outside their organizations, the AIA said. A mid-2008 survey of AIA committees found that most respondents were members of the Government–Industry Data Exchange Program (GIDEP), which aims to reduce resource expenditures through the sharing of technical information.

The AIA report noted that GIDEP asks members to report suspected counterfeit parts and to identify the supplier but added that its survey found that GIDEP members are "hesitant or not permitted to identify the supplier due to potential legal issues or other concerns." If the supplier is not identified, however, GIDEP cannot alert other companies that may have acquired the same components from the same supplier, the report said.

Among a handful of similar reporting programs is the U.S. Federal Aviation Administration's (FAA's) Suspect Unapproved Parts Program (SUP) (Table 1). When companies submit a report to the SUP, the FAA investigates and publishes its conclusion on the FAA Web site as an "unapproved parts notification."

The AIA recommended that companies and government agencies file their reports to a common database "so the extent of the problem of counterfeit parts in the supply chain can be known and the proper response can be undertaken." The use of GIDEP has several advantages, the report said, including that it is managed by a federal agency — which means that it can "protect sensitive information or the detection methods used to identify counterfeit parts or materials" — and that it is not fee-based.

Disposing of Counterfeit Parts

Companies should develop plans for disposing of known or suspected counterfeit parts, and government agencies should develop guidance for disposal, the report said.

"Proper disposition … prevents their reintroduction into the supply chain," the report said, warning that if a counterfeit part is returned to the supplier, it might be re-sold. In addition, returning a counterfeit part "allows counterfeiters to learn that their attempts were detected."

FAA recommendations call for mutilating scrap parts "to prevent misrepresentation," the report said. "Mutilation includes grinding; burning; removal of a major integral feature; permanent distortion of parts and materials; cutting a significant size hole with a cutting torch or saw; melting; sawing into many small pieces; and removing manufacturer identification, part, lot batch and serial number. Removing the identification and part markings without rendering the part useless is not an acceptable option and increases the opportunity for counterfeiting."

Obsolescence

The report also recommended that the industry "take proactive steps to deal with component obsolescence." The recommended actions included the use of life cycle analysis tools to predict "when components are in the last phases of their life cycle and are heading toward obsolescence and may become difficult to obtain and require acquisition through non-franchised sources."

Information Sources for Reports of Counterfeit Parts	
SUP Reporting	**GIDEP Reporting**
Reported by industry participants to FAA	Cooperative effort between government and industry participants for any project or program
Contains part information	Contains part information
Affected part or material	Affected part or material
Description of failure	Description of failure/how identified as counterfeit
No rebuttal after FAA investigation	Provides time for rebuttal of report
Not searchable — only FAA investigated reports posted	Searchable reports
Voluntary reporting	Voluntary reporting
Only for FAA-related activities	Applicable to all branches of U.S. government

FAA = U.S. Federal Aviation Administration; GIDEP = Government Industry Data Exchange Program; SUP = FAA Suspected Unapproved Parts Program

Source: Aerospace Industries Association

Table 1

Other recommendations called on the aviation industry to develop counterfeit parts control plans to document "processes used for avoidance, detection, risk mitigation, disposition and reporting of counterfeit parts" and to work with government and various organizations to create standards for mechanical parts and materials.

Another recommendation asked the industry to develop training programs to help employees in detecting, reporting and disposing of counterfeit parts. In addition, the report called for passage of legislation to enable the U.S. Customs and Border Protection agency to "consult trademark rights holders … for assistance in determining whether or not imported goods are authentic." ☕

This article is based on the AIA report, Counterfeit Parts: Increasing Awareness and Developing Countermeasures, *published in March 2011.*

Note

1. U.S. Department of Commerce, BIS Office of Technology Evaluation. "Defense Industrial Base Assessment: Counterfeit Electronics." January 2010. Cited in the AIA's *Counterfeit Parts: Increasing Awareness and Developing Countermeasures.*