Fighting the Fakes

Effective strategies for mitigating the risks of counterfeit parts

By Andrew K. Reese, with Rory King

An increasing number of counterfeit parts are entering the supply chain, putting quality, brand reputation and sales revenue in jeopardy, as well as creating risks to health and safety. The electronics supply chain is still grappling with how to mitigate the dangers of counterfeits. However, many companies in the sector already are putting in place effective programs aimed at reducing, if not eliminating, the counterfeit risk. This whitepaper briefly describes the scope of the problem and the government and industry reaction, and then offers a look at how one company, L-3 Communications, is approaching this thorny issue.

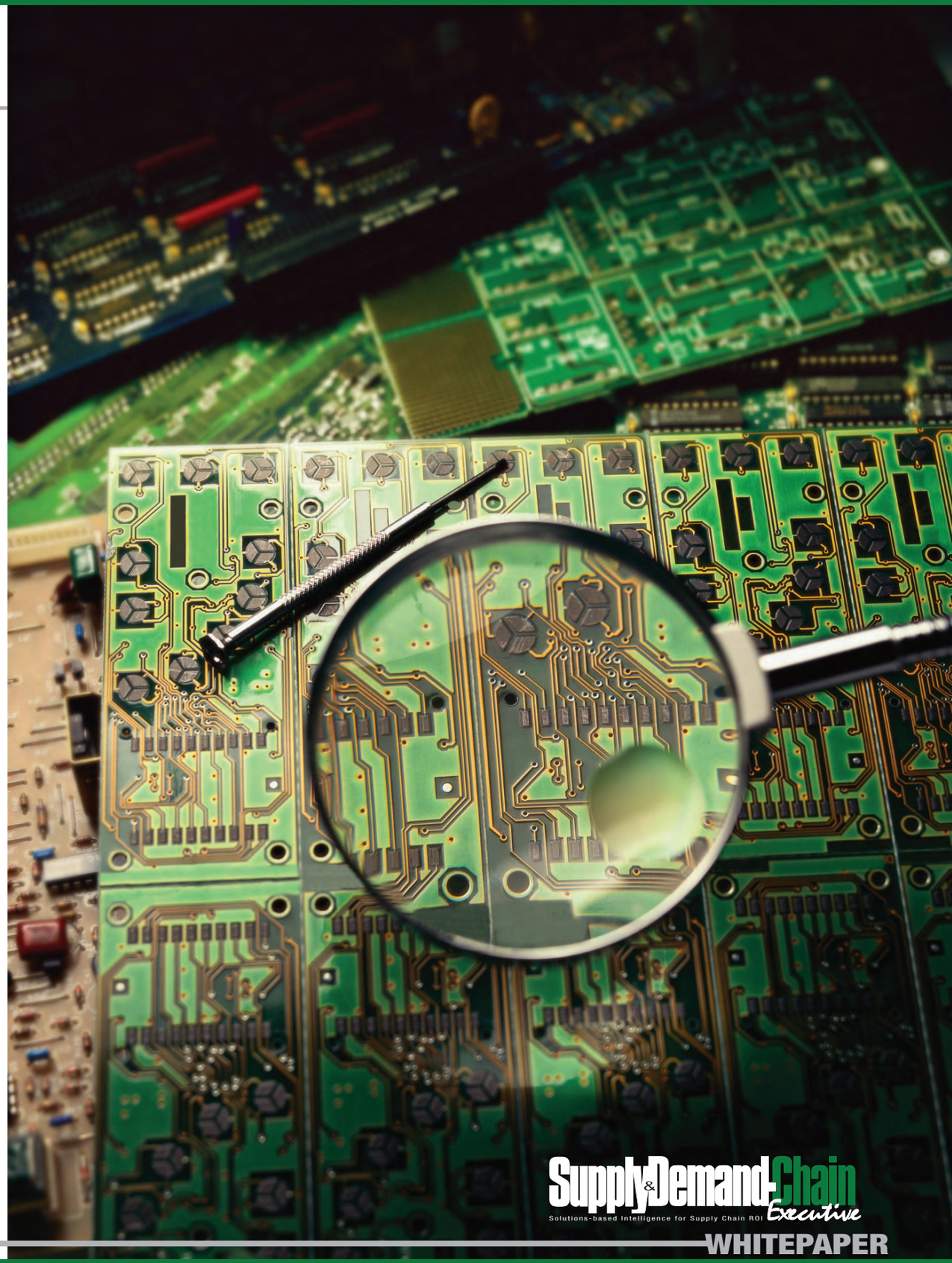
A Growing Threat

Counterfeit and fraudulent goods cost U.S. businesses more than $200 billion a year and result in the loss of 250,000 U.S. jobs, according to the Federal Bureau of Investigations. Within the electrical components sector, industry estimates put the losses at up to $10 billion annually. But in addition to economic impact, counterfeit and suspect parts and components also pose a significant risk to health and safety.

Consider that the U.S. Federal Aviation Administration once estimated that 2 percent of the 26 million parts installed on aircraft annually – a total of 520,000 parts – may be "substandard," a category that includes counterfeit and fraudulent parts. Or consider this statement from a recent report by the Electric Power Research Institute: "In the U.S. commercial nuclear industry, several CFSIs [counterfeit, fraudulent and substandard items] have been detected prior to being placed in active industry, *and several others have been detected only after installation*."[1] Or this from the Department of Defense: the DoD reported last year that it had documented incidents of counterfeits in its supply chain ranging from GPS oscillators to rotor retaining nuts used to hold the rotor to the mast of certain helicopters – and in many cases, failure of these parts could result in failure of a mission and/or loss of life.[2]

The problem of counterfeits is growing, too, despite government and industry efforts to curtail

1. "Plant Support Engineering: Counterfeit, Fraudulent, and Substandard Items – Mitigating the Increasing Risk," October 2009. (Emphasis added.)
2. "DOD Should Leverage Ongoing Initiatives in Developing Its Program to Mitigate Risk of Counterfeit Parts," U.S. GAO, March 2010.



Supply & Demand Chain Executive
Solutions-based Intelligence for Supply Chain ROI
WHITEPAPER

the influx of parts into the supply chain. Within the electronics sector, the Bureau of Industry and Security, under the U.S. Department of Commerce, released a study last year showing that incidents of counterfeit electronics grew 142 percent from 2005 through 2008. Increased counterfeit incidents occurred in all the industries tracked in the study, including commercial aviation and the high-reliability medical, industrial and automotive sectors. Among the conclusions of the BIS report: "No type of company or organization has been untouched by counterfeit electronic parts. *Even the most reliable of parts sources have discovered counterfeit parts within their inventories.*"[3]

Industry Responds

Both government and industry, as well as individual companies, have responded to the rising threats posed by counterfeits. The Government Industry Data Exchange Program (GIDEP), for example, provides a Web-based system for sharing information on counterfeits parts. Users of the system can submit information about suspected counterfeit parts, and this information is then shared through a database. Suppliers have 15 days to respond to posted information before it goes "live" in the database. The program is sponsored by the Defense Logistics Agency and NASA, as well as the Canadian Department of National Defense.

Industry groups have taken action against counterfeits, too. The Aerospace Industries Association (AIA), for example, has formed a Counterfeit Parts Integrated Project Team (IPT), with the goal of working with government agencies, OEMs, other industry associations and independent distributors on policies and standards to help mitigate the risk of introducing counterfeit parts and materials into the aerospace, space and defense supply chain.

Elsewhere, SAE International, the standards development organization, established its G-19 committee in 2007 as a direct result of the increasing volume of counterfeit electronic parts entering the aerospace supply chain. The committee is charged with developing standards to help mitigate the risks of counterfeit electronic components, including the SAE AS5553 standard applicable to the OEM and contract manufacturer (CM) community; AS6081, which prescribes counterfeit part avoidance requirements applicable to distributors; and AS6171, which applies to the testing and inspection community.

In the private sector, ERAI, founded in 1995, is an information services organization that monitors, investigates and reports issues affecting the global high-tech electronic supply chain. The company provides tools to mitigate risk from counterfeit and substandard parts, and its subscribers include OEMs, CMs, distributors, original component manufacturers (OCMs), government agencies and industry associations. It is notable that over the past decade, more than 4,000 incident reports have been made to GIDEP and ERAI, which are the two industry standard reporting entities recommended in SAE AS5553. Of these reports, 91 percent have been made via ERAI and 9 percent via GIDEP.

ERAI has an exclusive agreement with global information company IHS to bring its product and services to market. IHS provides access to a standards management platform which offers a single entry point for standards like SAE AS5553 and the numerous standards collections that are cross-referenced within, such as ESD, IDEA, IEC, ISO or JEDEC. The company also offers materials, parts and obsolescence management products and services of which ERAI has integrated its offerings, in order to provide a robust toolset for supply chain risk and counterfeit part mitigation. It's here at IHS that industry can access thousands of GIDEP and ERAI counterfeit reports in a unified manner.

In addition to these industry-wide responses to counterfeits, many individual companies in the corporate sector have undertaken initiatives to minimize their risk exposure to counterfeits. Next we'll look at how one company is approaching this challenge.

Tackling Counterfeits at L-3 Communications

Headquartered in New York City, L-3 Communications employs approximately 63,000 people worldwide and is a prime contractor in C3ISR (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) systems, aircraft modernization and maintenance, and government services. L-3 is also a leading provider of a broad range of electronic systems used on military and commercial platforms. The company reported 2010 sales of $15.7 billion.

L-3 established its Counterfeit Parts Team in 2007. In doing so, the company was influenced by requirements coming in from its customers for certificates of conformance (C of Cs). The customers had requirements for approval of the procurement process if an OEM certificate could not be provided, as well as burdensome liability clauses for counterfeit escapes. With its customers making their own major efforts on counterfeits, L-3 faced the prospect of having to manage these requirements for commercial off-the-shelf (COTS) hardware or production lines that feed multiple customers, a particularly daunting challenge. In the face of these requirements, L-3 opted to take a proactive approach to counterfeits.

"We needed to control our own destiny by emphasizing prevention," says Rick Roelecke, director of quality assurance with L-3 WESCAM Sonoma

3. "Defense Industrial Base Assessment: Counterfeit Electronics," January 2010. (Emphasis added.)

Operations, based out of California. Roelecke is the corporate counterfeits parts lead across L-3, heading up the L-3 Counterfeit Parts Team comprised of over 35 divisional representatives. The Counterfeit Parts Team has implemented a comprehensive counterfeit mitigation program across all L-3 companies (comprising more than 100 divisions) through release of a Corporate Policy Procedure. Seizing the initiative in this way has allowed L-3 to define its own procurement guidelines around counterfeits and to identify its own approved independent distributors. The company was able to define its own risk mitigation processes to prevent counterfeit or substandard parts from reaching its customer community, and it also allows L-3 to protect its liability with regard to counterfeits.

The mission statement of the L-3 Counterfeit Parts Team (CPT) is "to define and provide guidelines for managing and controlling the risks associated with counterfeit parts." From a practical perspective, that meant establishing procedural guidelines for all L-3 divisions that address procurement practices, supplier/distributor controls and part screening requirements. The team identified and surveyed independent distributors that have systems and processes to screen for counterfeit parts, and it identified approved independent test facilities. In addition, the CPT defined purchase order and subcontract flow-down requirements. "We actually released in the L-3 community the first material and quality policy at the corporate level for this activity, and then we started developing our inspection and test guidelines to screen for counterfeit parts," Roelecke explains.

Keys to Success

Communication was critical to socializing the new policies and procedures throughout the company, Roelecke notes. The Counterfeit Parts Team assumed responsibility for communicating government, industry and customer requirements/issues and sharing lessons learned internally within L-3 via the company's intranet.

At the foundation of its counterfeits strategy, L-3 had in place a comprehensive diminishing manufacturing sources and material shortages (DMSMS) program to manage material obsolescence across the company's product lines. L-3 has its more than 100 divisions submit their bills of material to a central division to create one combined obsolescence list. The company leverages IHS lifecycle management tools to manage component lifecycles and identify potential obsolescence risk, as well as the ERAI solution for managing counterfeit risk. IHS, including through its exclusive partnership with ERAI, offers tools that monitor components in a bill of material for availability, compliance, obsolescence and counterfeit risks as part of an enterprise-wide approach to product content management. Its PCNalert service provides daily updates of product change notices (PCNs), end-of-life (EOL) notices and counterfeit alerts for parts based on a company's approved vendor list (AVL) to help monitor and analyze potential sourcing and compliance risks.

The ERAI solution specifically targets counterfeit risk and alerts L-3 when a part that is going obsolete represents a risk for counterfeiting. The notices that ERAI generates to L-3 are sent out automatically to L-3's various divisions, alerting them that when they must go out to the independent market in the case of obsolete parts, which of those parts carry a high risk of a counterfeit. L-3 also tries to limit instances of going to the independent market to those cases where obsolescence is a factor and not due to schedule or cost issues.

Counterfeit parts will remain a thorny challenge for the electronics supply chain. However, a disciplined, structured approach can help your company mitigate the risk of counterfeits.

Of course, for many organizations, fully avoiding the independent market is not always possible or practical. A company may find it necessary to go out to the independent market to avoid having to re-qualify a part in order to meet certain customers' schedules or due to cost considerations. And that really is the point of leveraging tools like the ERAI solution, so that when a reputable distributor for a specific part is identified on the independent market, the buying organization can run that supplier and that specific segment of the BOM against the ERAI list to verify it against potential counterfeit risks. The process provides a constantly updated view of a company's product risk profile. The results of that profile for a given supplier or part can form the basis of a decision whether to add additional testing on a part – thermal screening or electrical testing, for example – beyond just marking permanency, device body visual or other standard inspection steps as part of a risk mitigation process. The key is screening a distributor even if they are on the approved list, and screening the part number, for every procurement, every time.

Companies also should look to put in place consistent policies for how it works with independent distributors. L-3 sets uniform standards for its distributors across all its divisions, but also allows the divisions to impose their own testing and screening requirements specific to their segment. A basic checklist for questions to put to a given distributor might include:

- Are they members of the Independent Distributors of Electronics Association (IDEA) and ERAI?

- Are they AS9120 and ISO9001:2000 certified?
- Are they ESD S20.20 Compliant?
- Are their inspectors certified to IDEA-3000?
- Do they have supplier controls and flow-down clauses regarding counterfeit mitigation requirements?
- Have they ever delivered a counterfeit or substandard part to a customer? If so, how did they resolve the issue?
- Do they have a die library and will they share it?
- Do they offer escrow services?
- What is their policy upon discovery of counterfeit or suspect parts in terms of impounding and reporting to organizations like GIDEP and ERAI?
- Which third-party testing facilities do they use, and which services were performed?
- Do they purchase from regions likely to be the source of counterfeits or substandard parts, such as China, India or Africa?

Membership in IDEA and ERAI demonstrates that they are active members of the community interested in contributing to preventing issues with counterfeits, while certifications and compliance with standards help ensure that they are staffed and equipped to properly manage and mitigate counterfeit-related issues. Properly certified inspectors that have passed the IDEA-ICE-3000 Professional Inspector Certification Exam will have knowledge of how to detect and identify counterfeit parts. Of course, surveying distributors can provide valuable feedback, but companies should also consider site visits to supplier facilities to ensure that they have the right equipment to perform inspections. And a company must be prepared to enforce a policy that precludes purchasing parts made in an "at risk" country.

How your company opts to treat counterfeits also will have an impact on how you structure your relationship with a supplier. You might decide, for example, that detecting a counterfeit and returning it to the supplier for a refund would represent too great a risk for your company. In this case, you could opt to not pay for a lot unless it has passed your independent screening houses and your reports have been approved and so forth, at which point your company would formally take ownership of the parts and pay the supplier. If, by chance, a part is found later to be suspect or substandard, many companies will impound and destroy the parts rather than return them to the supplier, considering that in the case of a part returned to the supplier, their company would be as much liable as if they had processed it themselves.

Finally, it is worth reiterating that communication is key to a successful counterfeits risk mitigation progress. That includes influencing your customer as part of your redesign process. If you are using tools like those offered by IHS to manage obsolescence, and you know you are going to have an obsolescence event coming in the future, you need to start communicating that to your customer as early as possible. You will want to educate them on your obsolescence issues, talk with them about designing those parts out of your products, and discuss how you can avoid using the independent market.

You also must continuously educate your contract manufacturers regarding your requirements and policies on the use of the independent market. Implement a system to educate your major subcontractors and critical assembly suppliers; make sure you review and approve their counterfeit risk mitigation control plans; and audit their procedures and processes. And communication must be maintained within your own four walls, with your own employees, regarding your policies and processes. Train your incoming inspection and production personnel on counterfeit and substandard part visual characteristics.

In conclusion, counterfeit parts clearly will remain a thorny challenge for the electronics supply chain. However, a disciplined, structured approach can help your company mitigate the risk of counterfeits – and help to inoculate you and your trusted supply chain partners against this modern contagion. ■

About the Authors

Andrew K. Reese is editor of Supply & Demand Chain Executive. He can be reached at areese@sdcexec.com. Rory King is Global Director, Design & Supply Chain at IHS. He can be reached at rory.king@ihs.com.

This Special Report underwritten by IHS Inc., in partnership with ERAI, Inc., a privately held global information services organization that monitors, investigates and reports issues that are affecting the global supply chain of electronics.

IHS (NYSE: IHS) is a leading source of information and insight in pivotal areas that shape today's business landscape: energy, economics, geopolitical risk, sustainability and supply chain management. Businesses and governments around the globe rely on the comprehensive content, expert independent analysis and flexible delivery methods of IHS to make high-impact decisions and develop strategies with speed and confidence. IHS has been in business since 1959 and became a publicly traded company on the New York Stock Exchange in 2005. Headquartered in Englewood, Colorado, USA, IHS employs more than 4,400 people in more than 30 countries around the world. www.IHS.com.