

TESTIMONY OF RALPH L. DENINO
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Before
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Hearing on
Counterfeit Electronic Parts in the Defense Supply Chain
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Introduction

My name is Ralph DeNino, and I am L-3 Communications' Vice President, Corporate Procurement. I've been employed at L-3 Communications since December 2000. At L-3, I have corporate-wide responsibility for Supply Chain Management and Quality Management.

About L-3 Communications Corporation

L-3 is a prime contractor in Command, Control, Communications, Intelligence, Surveillance and Reconnaissance (C³ISR) 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. Our customers include the U.S. Department of Defense and its prime contractors, U.S. Government intelligence agencies, the U.S. Department of Homeland Security, U.S. Department of State, U.S. Department of Justice, allied foreign governments, domestic and foreign commercial customers and select other U.S. federal, state and local government agencies.

L-3 is composed of four business segments:

1. Command, Control, Communications, Intelligence, Surveillance and Reconnaissance (C³ISR)

L-3 provides airborne and ground-based products and services for the global ISR market, networked communications systems and secure communications products for real-time situational awareness and response.

2. Government Services

L-3 provides a full range of engineering, technical, enterprise information technology (IT) and cybersecurity, advisory, training, and support services to the United States military, government agencies and allied foreign governments.

3. Aircraft Modernization and Maintenance (AM&M)

L-3 provides modernization, upgrades and sustainment, maintenance, and logistics support services for military and government aircraft and other platforms.

4. Electronic Systems

L-3 provides a broad range of products across several business areas that include marine and power systems, microwave and SATCOM products, displays, aviation products, training and simulation, electro-optical/infrared products and systems, warrior systems, precision engagement, security and detection systems, applied technology, telemetry and RF products, power and propulsion systems, and undersea warfare and ocean sciences products.

Obsolescence and the Risk of Counterfeit Parts

As a major aerospace and defense contractor, L-3 Communications provides our worldwide customers with a sophisticated array of high tech products. In the world of high tech products there is a common element: the need for and availability of quality, high reliability electronic components. The reality that L-3 and other aerospace/defense contractors face is that electronic components are increasingly susceptible to two significant risks: obsolescence and counterfeiting. Component obsolescence is a constant issue that must be considered early in the

design and product development phases to mitigate risks to schedule and multi-year maintenance needs. Counterfeiting, primarily originating in Asia, is now a sophisticated multi-billion dollar industry. With sophistication levels of counterfeiters escalating, detection and avoidance are becoming increasingly difficult. These issues are exacerbated by the service lives of fielded defense weapon systems, which are now being extended beyond their original planned life cycle. It is not unusual for a fielded system to be operational for anywhere from 25 – 40 years. These problems are further complicated by a reduction in the industrial base dedicated to production of electronic components that support military products. Defense and civil aerospace related acquisitions now account for less than one and a half percent of total microelectronic semiconductor sales.

Compounding the problem in the Aerospace & Defense industry are the long product design cycle inherent in military systems and the ever shortening life cycle of available components. Obsolescence challenges are especially apparent for Electrical, Electronic and Electromechanical (EEE) commodities. Obsolescence in the last few years has been driven not only by the increasing speed of technological change and market consolidation, but also by new environmental regulation, such as Restriction of Hazardous Substances (RoHS), which affected the market by driving change to a “lead free” environment. The obsolescence and counterfeit parts challenge was astutely summarized by Ted J. Glum, director of the DoD’s Defense Microelectronics Activity Unit when he stated, “The defense community is critically reliant on a technology that obsoletes itself every 18 months, is made in unsecure locations and over which we have absolutely no market share influence.” (“Pentagon Worries About Chinese Chips” A. T. Gillies, 9/4/08).

Having to find sources for obsolete electronic parts also increases the need to buy from nontraditional sources, because by definition the Original Component Manufacturer (OCM) or its authorized, franchised distributor no longer stocks the original part that is now obsolete. In turn, having to rely on non-traditional sources of supply, typically referred to as Independent Distributors (ID), results in increased risks of encountering counterfeit parts. Independent Distributors operate under far less regulation and control than OCMs, and are not as accountable as OCMs are to long-term customers. While obsolescence can be dealt with in other ways, such as redesign to utilize currently available electronic components or reproducing the original part, these options are normally not available due to a lack of government funding, a problem that would appear likely to increase in the current budget environment.

L-3 recognizes the need to address these risks and obstacles to ensure both supply chain availability of electronic components and customers' confidence in our products. The creation at the corporate level of L-3's Diminishing Manufacturing Sources and Material Shortages (DMSMS) program was the first step taken to proactively work obsolescence issues. The DMSMS program features a system that provides divisions a tool for uploading their Bills of Material (BOM) to receive life cycle analysis and up to date obsolescence information on Military Standard and commercial electronic components.

Similarly, understanding that obsolescence challenges increase the serious risk of exposure to counterfeit parts in the supply chain, a corporate level Counterfeit Parts (CP) program was

established to focus on addressing the emerging risk and to implement a strategy that could be deployed by all divisions of the corporation.

L-3 Counterfeit Parts Risk Mitigation Program

More specifically, L-3 formed a corporate-wide Counterfeit Parts Team (CPT) in December 2007 to share information and experiences across all L-3 divisions, to increase awareness of the challenges and to provide education and training. The CPT developed a database of information and lessons learned about counterfeiting techniques, which is shared with all divisions of the corporation. The team also set out to develop procedures and to define testing requirements to detect counterfeit parts and mitigate risks.

This resulted, in December 2008, in L-3 implementing Material Quality Operating Procedure (MQOP-001): Counterfeit Parts Risk Mitigation Program to address the counterfeit parts issue. As Counterfeiting techniques evolved, the Procedure was updated in March 2011. To further improve our process, to impose more stringent testing requirements and to increase the focus on avoiding the use of obsolete parts, we updated our Procedure again in early November of 2011.

Our CPT's efforts are closely tied with our Diminishing Manufacturing Services and Material Shortages (DMSMS) Team because, as noted above, obsolescence increases exposure to the counterfeit market place. In that regard, to address the risks posed by Independent Distributors, we began our efforts to narrow the listing of Independent Distributors used for sourcing obsolete devices. An assessment of our approved independent suppliers resulted in the corporate approved listing of IDs being reduced from 16 suppliers to six in March 2011, with a stated goal

of further reducing the listing to four. In May 2011, this goal was achieved. Correspondingly, and earlier, in March 2008, L-3 became a member of the Electronic Retailers Association International (ERAI), the global resource for companies involved in purchasing and selling of manufacturing electronic components.

Our teams also recognized that improvements were required in education, training and data sharing on counterfeit parts techniques and counterfeit parts occurrences taking place across the entire aerospace and defense industry. Accordingly, the corporation sponsored two series of Counterfeit Part Risk Mitigation and Component Obsolescence Management events. This included three regional symposia held in fall of 2008. More recently, five regional symposia were conducted in the fall of 2010, attended by over 250 professionals in the disciplines of Supply Chain Management, Quality Management, Program Management, and Engineering. These symposia were also open to and supported by L-3 subcontractors. In addition to presentations by L-3 personnel at these training and education sessions, the event was supported with presentations by industry experts and a representative from the Government Industry Data Exchange Program (GIDEP).

To supplement training, articles on the CPT's activities and industry trends in counterfeiting techniques, as well as our DMSMS/obsolescence management program are regularly featured in our corporate-wide Supply Chain and Quality Management Newsletter. In addition to regularly scheduled teleconferences, the CPT maintains a robust intranet site that provides valuable information accessible to L-3 employees. Suspect and counterfeit part experiences at L-3,

training materials for use with our subcontractors, industry guidance and other important resources are housed at this site.

Specific Incidents of Counterfeit Parts that L-3 Has Experienced

L-3 Communications Integrated Systems L.P. (L-3 IS) is the prime contractor for the United States Air Force Joint Cargo Aircraft C-27J program. This program began as a United States Army-led program in 2007 and transitioned in 2010 to the Air Force under the current C-27J System Program Office (SPO) within the Mobility Directorate at the Aeronautical Systems Center (ASC) of the Air Force Material Command (AFMC) at Wright-Patterson Air Force Base, Ohio. It is a program of record and classified as an Acquisition Category (ACAT) ID. Although the aircraft is based upon the C-27J transport produced by Alenia Aeronautica, S.p.A., its avionics elements derive heavily from the Lockheed Martin C-130J aircraft.

The C-27J program experienced four instances of suspect counterfeit electronic components since the program started. These have involved the avionics systems for the Mission Computer provided by BAE Systems of Austin, Texas; the Color Multipurpose Display Units (CMDU) provided by L-3 Communications Display Systems of Alpharetta, Georgia (which has been affected on two separate occasions); and the Type I Bus Adapter Unit (BAU) provided by Goodrich of Vergennes, Vermont. One additional instance of suspect counterfeit electronic components involved Ground Support Equipment (GSE) for the ALE-47 Countermeasures Dispensing System (CMDS) provided by BAE Systems of Austin, Texas.

In the case of the C-27J, L-3 IS, as the prime contractor, promptly notified its Government customer on each occasion as soon as it became aware of suspect counterfeit components. L-3 Display Systems, which manufactures the CMDUs, also notified all of its customers in both cases of the suspect counterfeit part.

In the case of the counterfeit Lattice chip used in the CDMU, L-3 Display Systems received it from its approved (at the time) Independent Distributor along with a test report showing that the part was authentic. When parts were sent out for re-tinning (a normal process even for authentic parts), the re-tinning facility encountered difficulty and proposed an alternative method. When L-3 Display Systems queried the OCM about the part, the OCM informed L-3 Displays that the part was counterfeit. L-3 Displays notified its customer, Alenia Aeronautica, on February 2, 2010. By May 2010, the Lattice counterfeit parts had been removed from U.S. Air Force aircraft and replaced.

In November 2010, a Samsung VRAM chip that had been previously tested and represented as authentic by a third party lab was identified as suspect counterfeit as the result of a supplemental third party independent test. This additional testing was performed after anomalies were noted during L-3 Display Systems' standard testing methodology. L-3 Display Systems notified its customer, Alenia, of the counterfeit part but that notification was not passed on to the prime contractor, L-3 Integrated Systems, until September, 2011. When L-3 IS was notified, it in turn notified its customer, the Air Force C-27J Systems Program Office. L-3 IS will take whatever corrective action its customer requests, and the current remedy is to replace the VRAM chips

during normal scheduled depot maintenance unless a failure occurs for any reason that would necessitate immediate repairs.

It should be noted that there has been no discernable effect on the C-27J. The C-27J program tracks avionics performance and failures by means of a Failure Reporting And Corrective Action System (FRACAS). After analyzing the FRACAS history through this past summer, there have been no abnormal failures attributed or noticed for the affected Mission Computers, CMDUs, BAUs or CMDS Test Sets. No degradation to performance has been observed due to these parts.

This can be partially attributed to the mechanisms put in place for the assembly, test and delivery of avionics systems in nearly all DoD procurement programs. The process of procuring piece parts and their progressive assembly from wafer to integrated circuit to circuit board to final avionics Line Replaceable Units (LRUs) or Weapons Replaceable Assemblies (WRAs) is always founded on progressive verification and testing of the item through each stage of assembly.

Even at the circuit board or LRU/WRA box level, the use of complex acceptance test processes and “burn-in” (or Environmental Stress Screening (ESS)) at the manufacturing plant before delivery into the DoD supply system, adds confidence that the items will perform in service and that defective parts will be identified and removed from the delivered inventory.

In the case of the C-27J JCA, there is also the benefit of Contractor Logistics Support (CLS) for the entire maintenance of the aircraft fleet, whether in CONUS or deployed. Whether by term of the contractual warranty provisions or by means of the CLS maintenance in the contract, the U.S. Government does not bear any cost for labor or material if the avionics systems should be

affected by defective material. All costs would be borne entirely by the contractor and its suppliers.

Conclusion

The rise in instances of suspect and counterfeit electronic components results from a rapid turnover of technologies in the commercial and military markets, which drives critical obsolescence issues daily across all areas of the electronics supply base. This is particularly troublesome for the DoD and its need to continue to support deployed systems – a need further complicated by the extended life of these systems. These issues are constant, daily challenges not only for the industry that contracts with the DoD, but also for all of the Government service agencies throughout their various support systems.

L-3 will continue to improve its obsolescence and counterfeit parts mitigation programs by reiterating strict adherence to its corporate procedures and policies across the entire enterprise, controlling Independent Distributor purchases, and by providing training and education to our personnel. Additionally, we will continue to work with our Government and industry partners and professional associations to develop and incorporate best practices throughout the supply chain. In any case, if any part is identified as suspect, L-3 will, as it has in the past, promptly notify all of its affected customers and work with them to remediate the problem in whatever way the customer determines is needed.

Finally, while L-3 has made significant efforts over several years to address the counterfeit parts challenge, the Senate Armed Services Committee's examination of the issue has been important

in underscoring the seriousness and depth of the problem and the need to rapidly develop an effective solution. L-3 looks forward to working with other companies and the Committee in achieving this goal.