

To: Defense Acquisition Regulations Council
Attn: Ms. Michele Peterson
Re: DFARS Case 2004-D011

This response to the proposed DoD regulations regarding the use of RFID relates directly to the consumer products, food and beverage industries (primarily Class I and Class VI items). GMA applauds DoD's actions to improve the supply chain and better serve our war-fighting customers in today's flexible military. The requirement of RFID tags on cases and palletized unit loads, however, will not solve the need for end-to-end supply chain visibility, in and of itself, and may place an undue hardship on companies in the food, beverage, and CPG industries.

EXECUTIVE SUMMARY

- **Reaching End-to-End supply chain visibility**
 - End-to-end visibility is achieved through system integration across the supply chain -- RFID merely simplifies asset identification
 - Recommendation: Harmonizing current disparate information systems could greatly improve supply chain visibility using today's bar codes
- **Accuracy of the cost burden estimate**
 - The IBM/AT Kearney study, "A Balanced Perspective: EPC/RFID Implementation in the CPG Industry" demonstrates most CPG categories have a negative 10-year Net Present Value Business Case
 - IBM/ATK study shows product category dynamics significantly influences Return On Investment
 - Costs to CPG manufacturers for RFID Implementation far exceed the initial DoD estimates
 - Manufacturers receive virtually no benefits from RFID unless real-time product movement is shared by the DoD
 - Recommendation: Pursue RFID programs on product categories with sufficient ROI to justify the extensive additional costs
- **Technology Issues**
 - Tag read rates on many CPG products remains low, both in test labs and in pilots
 - Tag quality is uneven, resulting in additional costs to manufacturers
 - Tag Application devices do not, for high volume manufacturers, operate at manufacturing line speeds, resulting in inefficiencies
 - Recommendation: Pursue case-level RFID program on mission critical products
- **Tag location**
 - RFID technical limitations may render tag unreadable based on DoD specs
 - Recommendation: Remove restrictions on tag placement for CPG products
- **Advanced Ship Notification**
 - ASNs, when used properly, can provide many of the same benefits as RFID
 - Recommendation: Pursue pallet level ASN adoption across DoD supply chain

CURRENT CPG INDUSTRY STATUS

Within the CPG industry, business analysts have estimated that CPG manufacturers are tagging less than 10 Stock-Keeping Units (SKUs) at the present time. This estimate is lower than previously thought due to cost considerations not previously included and technology issues not earlier known. Based on these latest estimates, the CPG industry, in most product categories, will be conducting pilot studies in controlled areas, but will not be tagging all cases and pallets for all products for a number of years.

As the progress of RFID technology is assessed, it is important to seek out objective third parties that are experts in both technology and supply chain processes. Organizations should be cautious about basing their RFID implementation decisions on feedback from companies selling RFID implementation services or technology companies making RFID hardware or software. One of the largest and most recognized supply chain analyst firms is AMR Research. AMR published a report at the end of 2004 summarizing the state of RFID implementations as a result of the Wal-Mart RFID announcement. The December 16, 2004 report entitled, "RFID Fast Followers Take Heed: Suppliers Spent \$250M in Round One", by Kara Romanow,¹ summarized their perspective based on interviews with many of the largest CPG companies. The key summary points were as follows:

- Wal-Mart Suppliers Spent \$250M To Implement RFID Thus Far
- Many Are More Convinced Than Ever That There Is No Benefit
- Consider Their Technology Investments To Be Throw Away Thus Far
- There Is Value, Tangible And Intangible, In Some Areas

One of the key findings of the report was that although there is no return on investment (ROI) for low cost products, there is a strong case for high cost products. The recommendation was to focus on a product category based approach, implementing categories where there is a positive ROI for both buyers and sellers.

The report also highlighted the high costs associated with implementation, isolated implementations between companies, throw away investments, and few products being actually tagged as some of the current challenges. From their interviews, most suppliers are only tagging between 2 to 10 Stock-Keeping Units (SKUs).²

This objective third party summary of the industry is important in truly quantifying the impact of the proposed DoD contract changes to suppliers. Most suppliers are clearly in a very small testing and pilot mode at this time.

We believe that the DoD should consider a more targeted approach on high value categories that can generate a positive ROI, and avoid low cost / low value CPG products.

¹ AMR Research, RFID Fast Followers Take Heed, Suppliers Spent \$250M In Round One, 16 December, 2004 by Kara Romanow

² AMR Research, RFID Fast Followers Take Heed, Suppliers Spent \$250M In Round One, 16 December, 2004 by Kara Romanow

REACHING END-TO-END SUPPLY CHAIN VISIBILITY

Supply chain visibility is an integration problem that will not be solved with RFID alone. Military logisticians supporting combat forces have historically had limited information on assets, particularly in theater. This lack of information leads to ineffective inventory management, inefficiency and delay across the supply chain.

RFID is an enabling technology that simplifies asset identification at a point in the supply chain, but will not provide end to end visibility required of combatant commanders. The desired end to end visibility will only be achieved through the integration of systems within the entire supply chain to share and communicate information and the synchronization of product data between information systems. Greater supply chain visibility within the DoD could be achieved today through the current use of bar codes if the disparate information systems throughout the current supply chain were harmonized.

As stated on both page 8 and page 65 of the initial regulatory flexibility analysis, “Business process reengineering is where DoD will reap the true benefits...” This statement relates to whatever identification technology is used in the supply chain.

ACCURACY OF THE COST BURDEN ESTIMATE

Several business case analyses have been conducted over the past year that outlines the costs and benefits to CPG manufacturers through use of RFID. IBM & A.T. Kearney were commissioned by the GMA to complete a detailed study on EPC/RFID implementation in the CPG industry. It is important to recognize that this study was based on actual detailed business case data from 24 different manufacturers whose sales are each greater than \$2 billion per year. The GMA study “A Balanced Perspective: EPC/RFID Implementation in the CPG Industry” highlights the differences in ROI by product category. In this study, 24 separate manufacturer business cases were consolidated and analyzed, demonstrating the sensitivity of ROI to specific category dynamics.

The business cases used in the GMA study examined costs and benefits estimated for implementation of RFID and considered many costs incurred by businesses that were not included in the “Initial Regulatory Flexibility Analysis of Passive Radio Frequency Identification” prepared for the DoD. These costs include tag application costs, fully converted label costs, printer costs for each manufacturing line, segregated inventory carrying costs, tag defect rates, etc. (Appendix A). The study showed that some low cost categories cannot get to a positive ROI even if the tags were free.

The benefits of RFID are predicated on the ability to read the RFID tags at several locations throughout the supply chain and share product movement data with manufacturers in a standardized, real-time system. Without full functionality throughout the supply chain, RFID provides very little benefit to DoD suppliers.

TECHNOLOGY ISSUES

RFID technology is still evolving and is not reliable for many products and/or situations. Manufacturers highlight 4 factors as key technology risks:

- Read rates
- Tag quality and standards,
- Speed and reliability of tag application devices, and
- Reliability and availability of reader systems.

Read Rates

RFID technology is still evolving and is not reliable for liquid based products and/or products packaged in aluminum/metal. Read rates continue to improve at the pallet level for liquid based products as new technology is released and process improvements are implemented; however, case level read rates are low and there are no known solutions to these issues at this time. During a study recently conducted by Checkpoint Systems, Inc., case level RFID read rates for these types of products were reported at less than 20%.

The low read rates with liquid and metal products are a direct result of RFID technology's current limitation. Simon Langford, manager of Wal-Mart's RFID strategy said, "Wal-Mart is working to improve read rates, having run into problems with liquid and metal products. Getting to 100% read rates will take innovations being developed to bypass the laws of physics, but that's quite a few years away, so we're setting realistic expectations on how we change our systems and integrate the information and what we expect suppliers to do."³

Some retailers have modified their RFID tagging policies to include pallet tagging only on products containing liquids, metal, and/or metalized packaging.

Tag Quality and Standards

RFID tags are made up of at least 5 component pieces (Appendix B). Silicon wafers for low cost passive RFID tags, the chip that carries the required data, are currently manufactured by only a few companies. Currently, these companies are not manufacturing the silicon wafers in full production mode, which results in uneven quality of the chip. Without a fully functioning chip, the entire RFID tag is useless. Although tag failure rates are improving, end-users are still experiencing 3-5% failure rates, on average.

Tag Application Devices

RFID tag application devices commercially available are prototypes that operate much slower than many case packing lines. Consequently, manufactures cannot tag widely at the point of manufacturing, resulting in multiple processing requirements and reduced line speed, thus increased costs.

Additionally, the RFID printer costs vary based on manufacturing line configuration and placement. The costs cited in the regulatory flexibility analysis do not include the cost of

³ InformationWeek, RFID Insights, Wal-Mart Tests RFID With Eight Suppliers, 3 May 2004 by Laurie Sullivan

slower manufacturing lines but also does not take into account the fact that most manufacturers run more than one manufacturing line within their system. The tag application device cost must be multiplied across the number of manufacturing lines making and packing product. For example, one GMA member company has over 1,400 product packaging lines.

GMA RECOMMENDATION: Pursue case-level RFID tagging for mission critical products (i.e. CPG products not included) that current technology limitations can support. Continue to evaluate pallet-level RFID programs for CPG products and pursue implementation when and if RFID technology and costs warrant. Look at ways to leverage existing technologies like bar codes and ASNs on lower cost CPG products.

TAG LOCATION/PLACEMENT OF MARKINGS

MIL-STD-129P defines correct placement of markings as “upper left two-thirds of the side of the container having the greatest overall, usable marking surface”. Section (c) (3) of the proposed regulations requires that the tag be affixed at the appropriate location on the packaging in accordance with MIL-STD-129P (section 4.9.2). However, due to the nature of RFID technology limitations, this required location may result in an unreadable tag. Many companies are testing to discover the most appropriate location for RFID tags to achieve maximum read rates according to the specific attributes of a product and its packaging. That “best” location can vary considerably by product and packaging type.

GMA RECOMMENDATION: Remove restriction on tag placement for CPG companies and allow placement based on maximum tag read rates.

ADVANCED SHIP NOTIFICATION (ASN)

Advanced Ship Notification (ASN) at the pallet level, a virtual pre-cursor to RFID, is a developing process in the CPG industry and not widely adopted at this time. We recommend ASN process adoption and process improvement on a pallet level be prioritized before RFID initiatives due to the immediate payback (i.e. accurate information notice and quick back door processing) for suppliers and customers.

GMA RECOMMENDATION: Aggressively pursue pallet level ASN implementations within the DoD supply chain.

INITIAL REGULATORY FLEXIBILITY ANALYSIS OF PASSIVE RFID VERSION 1.2, MARCH 2005 – SPECIFIC COMMENTS

We have reviewed the DoD’s Initial Regulatory Flexibility Analysis Of Passive RFID and would like to highlight a number of items for consideration:

Section 1.5: The repeated references to a “nested” parent child relationship with EPC case tags and pallet tags is not a capability that exists broadly today amongst CPG manufacturers. All of the limited customer pilots at this point do not require the case level EPC serial numbers to be sent with the ASN.

Section 3.2: The reference to the requirement of linear bar codes to access external databases is also a requirement with the current 96 bit passive RFID tags being used in the CPG industry. To obtain any details on the serialization on the tag would require querying an external database.

Section 3.3: We agree that the two most logical choices to enable enhanced visibility in the DoD supply chain are bar codes and passive RFID tags. The idea that no human intervention is required on RFID tags is not correct for RF unfriendly products. Many food products in the CPG industry contain metals, liquids, and metalized films which prohibit these cases from being read in a typical pallet configuration. Since the capability does not broadly exist to send the serialization as part of an ASN, pallets would need to be broken down and cases passed individually in front of a reader in order to get 100% case-level reads.

Section 3.3.1: EPCglobal sees both bar codes and RFID technologies co-existing for years. This supports a more targeted approach of using bar codes on low value products and RFID on high value and high importance items.

Section 4.4: Passive RFID is still unproven in harsh environments, specifically where refrigeration and freezing are involved due to condensation. Additionally, although referenced in this document, dynamic multi-block read and write capability is not available in the current 96 bit tags. The specifications are also moving to “locked” tags which secure the data written by manufacturers.

Section 5.1: Adoption rates are much slower than originally estimated, highlighted by the information shared earlier from the AMR Research report.

Cost & Benefit Analysis – True Impact To Suppliers

Section 6.4: There are a number of items in the benefit and cost analysis that do not accurately reflect the true cost impact to suppliers of meeting the proposed DoD RFID tagging requirements. Industry data concurs that there will be incremental costs of managing separate inventories of tagged and non-tagged products. Depending on the levels of automation, these costs can range from \$0.75 to \$2.00 per case in a post-production “slap and ship” environment. Additionally, many of the research and development (RFID labs), infrastructure, software, middleware, material handling equipment, etc. are not included in the economics.

The economic examples listed around a \$4,000 printer and a \$0.50 tag are highly simplistic and do not reflect the true costs of an enterprise implementation of RFID. Individual company business cases show these costs can be as high as tens of millions of dollars, not to mention reoccurring tag costs.

SUMMARY

Based on the above information, retailers throughout the CPG industry have modified RFID tagging requirements for their suppliers. Many retailers investigating, piloting, or rolling out RFID in their supply chain realize the challenges posed by RFID and its current limitations. These challenges and limitations are being addressed by both retailers and suppliers, but may, in some cases, take years to overcome.

The regulatory flexibility analysis of passive RFID included Class VI products based on the belief that the DoD and Wal-Mart share many common suppliers and that Wal-Mart was demanding that all Class VI products shipped to Wal-Mart have RFID tags. By including these same suppliers in RFID tagging requirements, DoD was allowing manufacturers to avoid having “to do unique things for DoD as opposed to those requirements mandated by other entities like Wal-Mart.”

However, at this time, Wal-Mart and other retailers are working with individual suppliers to limit RFID tagging to those products that can reasonably be expected to support the additional costs and receive the primary benefits. Therefore, the DoD mandate will now force many CPG manufacturers to maintain separate DoD inventory and incur additional supply chain costs.

Appendix A. “A Balanced Perspective: EPC/RFID Implementation in the CPG Industry” business case highlights

Cost Categories

Other: Includes the cost to manage and administer RFID-related infrastructure and data, labor associated with outbound only tag application, etc.

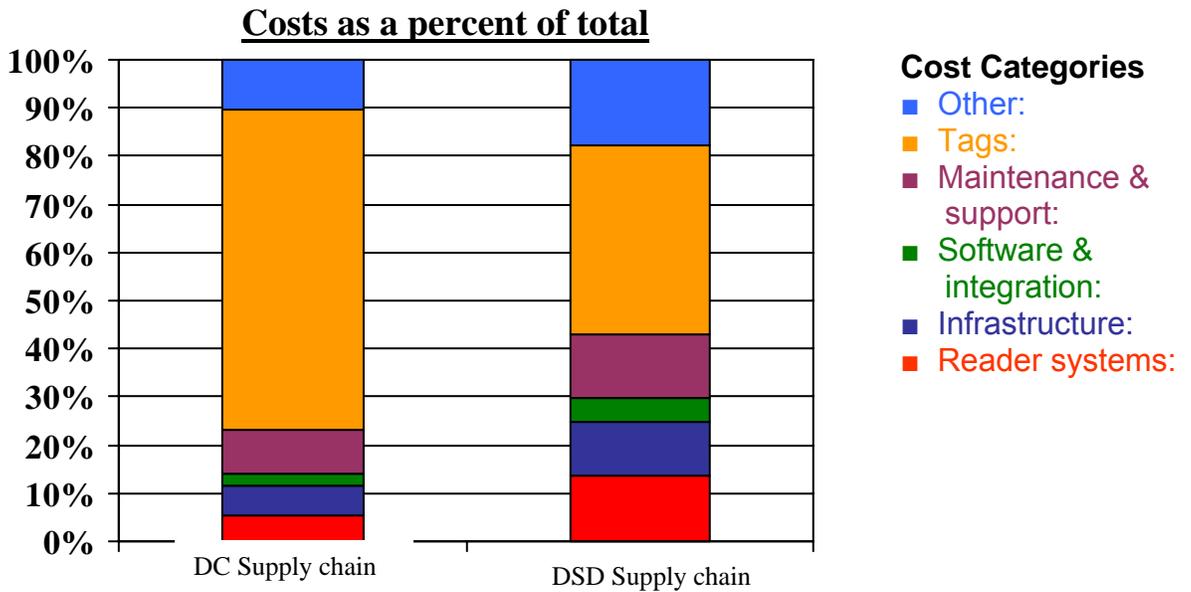
Tags: The cost to acquire RFID labels

Maintenance & support: The cost to maintain all RFID equipment including print and apply, printers, readers, antennas, and motion sensors

Software & integration: The cost to implement RFID-based system changes

Infrastructure: The cost to acquire and install print and apply equipment, label printer servers, and data storage

Reader systems: The cost to acquire and install readers, antennas, and motion sensors



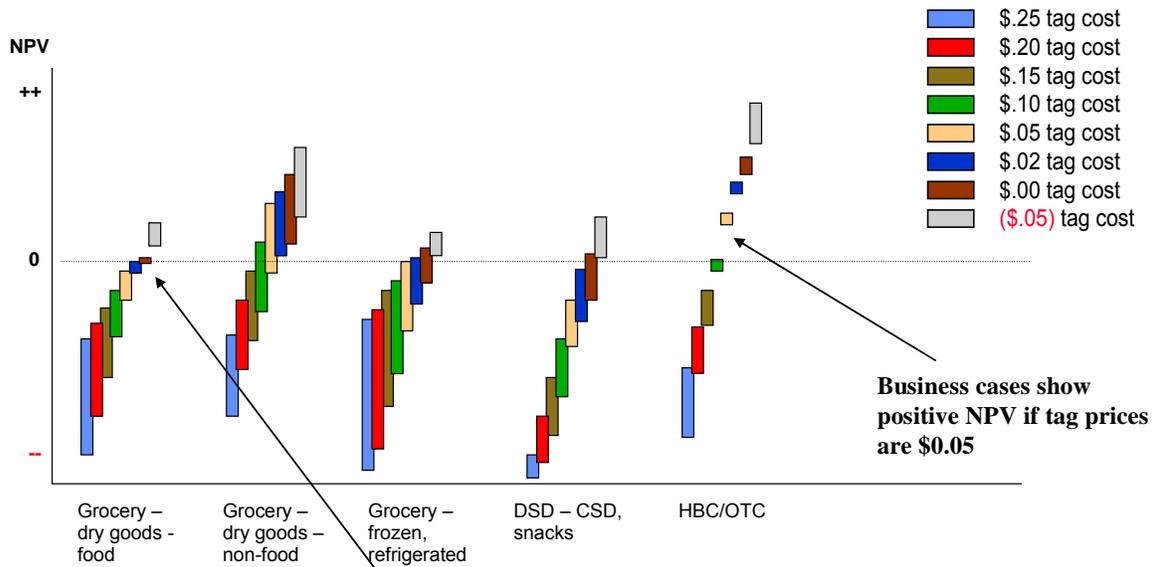
All costs are averages, and are expressed as % of total cost based on a 10-year NPV horizon

Appendix A. “A Balanced Perspective: EPC/RFID Implementation in the CPG Industry” business case highlights

Business case Results vary by Category

Analysis of Manufacturer Business Cases (Pallet and Case Level Tagging)

- Range of NPV Results by Product Category Using Constant Tag Costs



Business cases indicate that \$0.00 tags do not generate a positive NPV

Appendix B. Components of a Fully Converted EPC Label

Figure A1 illustrates the typical elements that comprise a “fully converted EPC label”, which is the basis for the EPC tag cost projections used by many of GMA member companies. They include the full set of components required for an EPC-tagged label that can be placed onto a typical pallet or case, including the silicon chip, strap assembly, antenna, and label with adhesive and liner.

Figure A1. Creating a fully converted EPC label.

