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CONVERGE AN ARROW COMPANY

Future of Obsolescence Management

LOOKING FORWARD
Edition IV

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Welcome!

Welcome to the latest issue of Looking Forward!

"Obsolescence will always happen as long as there is innovation. Therefore, innovation and obsolescence are just two sides of the same coin." – Holger Lange, Obsolescence Manager at UTC Aerospace Systems

This quote is featured in the interview with Holger Lange of UTC Aerospace on page 15, and it really struck a chord with us in terms of linking innovation and obsolescence. As we reflected at the FOM event in Amsterdam last September, obsolescence management might not be the most glamorous topic in the high-tech world of electronics. In its essence, it requires us to pause and look backward. The reason we call this publication Looking Forward is that the topic of obsolescence is so important and complex that we must keep pushing new ideas; we must keep innovating. We are very grateful to have a varied and interesting compilation of international experts in this issue, sharing their stories and visions for the future of obsolescence management.

In terms of events, we have much to look forward to, with the first U.S. FOM conference taking place in Los Angeles, California, on 4-5 October. We are delighted to confirm that Willie Brown of BAE and Professor Peter Sandborn of the University of Maryland have joined Tyler Moore of Arrow Electronics on our list of confirmed speakers. FOM 2017 in Los Angeles promises to be an excellent event! In addition, we will announce soon a fresh approach to our Amsterdam FOM event for the third quarter of 2017, where the latest in theory will meet practice. Further details can be found on our website at www.converge.com/fom.

Enjoy reading, and keep communicating!

Enda Ruddy,
Global Director FOM and EMEA

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WILLIE C. BROWN

DIRECTOR, SUSTAINMENT
SERVICES, SUPPORT SOLUTIONS

BAE SYSTEMS

Please tell us about your professional background.

My introduction to the world of obsolescence management started in graduate school, when I was researching a project to use neural networks to predict part obsolescence. Later, I joined a small start-up that focused on obsolescence analysis of electronic subsystems for the United States Air Force (USAF) F-15 program. As the lead software engineer, I developed the initial obsolescence management tool for that program. Over the years, my development team evolved that tool into the Advanced Component Obsolescence Management (AVCOM) system, which has been used by the USAF for the past 25 years.

While my career has stayed focused on obsolescence management over the past 30 years, I've held various technical and managerial positions with increasing responsibility and scope, including software engineering manager, director of technical services, and director of operations. In my current position as director of sustainment services, I have profit and loss responsibilities for a team of more than 300 technicians, logisticians, engineers, and program managers who provide technical publication, engineering, and obsolescence management services for various systems, including the V-22 Osprey, F-16, F-35, and intercontinental ballistic missile (ICBM).

I've been an active member of the Diminishing Manufacturing Sources and Material Shortages (DMSMS) community for over 20 years and have presented at, or served as a session moderator for, various conferences including Airworthiness, DMSMS, and COG. I'm currently the industry advisory group vice-chair for the Government Industry Data Exchange Program (GIDEP) and the DMSMS subcommittee chair for the Defence Standardization Program Office (DSPO) Part Standardization Management Committee. I hold a Bachelor of Science in computer engineering and a Master of Science in electrical engineering.

What trends in obsolescence management have you been observing in your industry?

Customers have begun expanding their management of obsolescence beyond electronics to include mechanical, structural, software, and other non-electronics. Over the past several years we've also seen a sharp increase in regulations regarding counterfeit management plans and processes. Both trends are being driven by changes in market dynamics and government contracting requirements. These contracting changes are being made to address the fact that militaries around the globe are keeping their platforms in service longer than originally intended, because of budgetary constraints, rather than replacing them with new ones. These aging fleets were designed with custom components rather than commercial-off-the-shelf (COTS) parts. As a result, acquiring the necessary parts to maintain aging fleets well past their intended useful life is time consuming and costly. Because of new contracting language flowing down the supply chain, the military is beginning to do a much better job of obtaining from the original equipment manufacturers (OEMs) the data packages needed to implement a successful obsolescence management program. This is resulting in a much more proactive approach than the typical military practices of reactive-mode management of obsolescence.

Are there any industry practices around obsolescence that you would like to see improved? Please explain.

I would like to see the creation of a detailed obsolescence management plan that educates the supply chain on the benefits of a proactive obsolescence management program instead of just flowing down requirements with minimal guidance. Including the supply chain

That's why it's critical that our industry, our customers, and our supply chain partners work together to understand part demands and lead-time requirements.

in the creation of this plan is one of the best uses of a program's resources. Failure to be proactive in managing future requirements can create a costly reactive mentality. That's why it's critical that our industry, our customers, and our supply chain partners work together to understand part demands and lead-time

requirements. This will better enable all parties involved to offer alternate solutions when obsolescence issues arise, rather than simply discontinuing the production of a part and being caught by surprise. The development of an obsolescence management process early in the life-cycle of a system will help control the total cost of ownership; don't wait until the end of production is in sight. The later this process starts in the life-cycle, the higher the total costs will likely be.

What changes would you like to see chip manufacturers make to address future obsolescence challenges?

It would greatly benefit the entire industry if component manufacturers did a better job of giving earlier notification of when they intend to stop manufacturing a part. Some manufacturers have improved their notification processes so that they can provide their customers with more confidence in supportability for their products. It does appear that component manufacturers have become more aware of the importance of early notification to their customers. But there are also cases where

manufacturers will only notify their specific customers, not the greater industry, when they are discontinuing products. In these situations, it is important that these notices are passed on from the customer to the responsible group or contractor that is managing end-of-life (EOL) notices and obsolescence case management services. With obsolescence issues, lead time is a critical issue for cost-effective resolution and maintaining availability of systems or platforms. Recognizing the monetary limitations that exist, particularly in the DoD industry, and looking for more timely ways of providing future EOL notifications would help to greatly reduce the growing challenges of obsolescence.

Specifically, what effect will the wave of chip manufacturer consolidations have on obsolescence?

There have been several major acquisitions over the years which have limited the number of available sources for semiconductors. Typically, if one redundant product, but not the entire product line, was eliminated it would create more demand for the remaining product(s). In general, recent consolidation in the semiconductor

industry has had more of an impact on sourcing than obsolescence at this point (i.e. parts with two or more sources become single source). For newer technology parts, in many cases the life-cycles are getting shorter compared with the past. Certainly the ever-evolving consumer electronics industry has driven shortened component life-cycles, but obsolescence mitigation has always been an issue for any long-life system. However, the number of EOL notices has decreased each year since 2014, with no obvious indication that component obsolescence is getting worse. Some in the industry think this trend of decreasing EOL notices may indicate that the electronics industry is stabilizing in regard to product changes/discontinuances among the original component manufacturers (OCMs). Although we haven't yet seen a major impact on obsolescence, we do see an increased risk in the impact of any future obsolescence events, due to the limited number of potential alternate sources.

What impact do government regulations have on your obsolescence purchasing practices? Please explain the differences.

Regulations can have a huge impact on purchasing practices and program costs. In some cases significant portions of a company's procurement process may require changing. Many of the regulations will also require a significant investment in employee training on the new regulations and a new company procurement process. The "Detection and Avoidance of Counterfeit Electronic Parts" rule issued in 2014 in the Defence Federal Acquisition Regulation Supplement (DFARS) is a good example. This was the finalized rule of the 2012 National Defene Authorization Act (NDAA), Section 818, enacted by the U.S. Congress in late 2011. The intent of the rule is to influence the purchasing, detection, inspection, testing, and reporting practices of the defence supply chain to mitigate the introduction of counterfeit parts. The result of the rule was a massive, industry-wide review and modification of company procurement and testing processes. These reviews led many companies to implement costly and significant changes to their purchasing practices, supply chains, and employee training requirements. The August 2016 changes to the rule are an acknowledgement by DoD that certain constraints of the rule have resulted in adverse consequences and costs.

From your viewpoint, what should the future of obsolescence look like?

Obsolescence management is fast becoming an integral part of system sustainment. Industry must continue to provide tools which assist managers in being or becoming proactive in managing these issues. I'd also like to see more partnerships in the obsolescence industry and a renewed commitment across the industry to proactive obsolescence management. A successful future obsolescence program must require proactive involvement and predictive tool use. It should be a more centralized function, especially among all the military services. There needs to be more partnerships and sharing of processes and solutions. It requires too much work, and is too costly, to continue to tackle obsolescence with a regionalized approach. I also feel these partnerships need to attack obsolescence proactively, instead

of reactively as most are currently doing. It's too costly, and the military is dealing with too many of their platforms being mission-incapable because of these regionalized and reactive approaches.

Is there any advice or suggestions you would like to share based on your experience with obsolescence?

There are three core areas of obsolescence management that I recommend anyone in our industry review and focus on to enhance their processes and identify efficiencies:

1. Creating an obsolescence management plan

- A good plan starts with the establishment of an obsolescence management team (OMT). An OMT – that includes stakeholders from across the supply chain – can think through the critical supply issues and identify proactive program strategies. The V-22 program is one of the most successful obsolescence management programs in the industry. This is an aggressively managed program, with active members of the OMT from Navair, Bell Boeing, NAVSUP, and BAE Systems continuously refining processes and procedures to minimize the potential of costly redesigns. The OMT developed a rigorous Obsolescence Management Plan (OMP) that covered the handling issues from identification, resolution, as well as contracting and funding to get issues resolved in a timely, cost-effective manner. Semi-annual meetings of the OMT and weekly telecoms keep the program on track.

2. Improving your vendor relationships

- Another key area that should be addressed in the management plan is developing and maintaining a good working relationship with the vendors and suppliers throughout the supply chain. Taking the time to educate the supply chain on the OM program you are creating and the benefits it brings to them is critical for preventing surprise 'No Bids' and getting the data needed to execute a successful program.

3. Data, data, data

- Finally, good data is paramount to the success of any program, whether it's in the acquisition or sustainment phase of the system life-cycle. While it's best to acquire all the bill of materials (BOMs) data possible, it's also important to collect data for COTS solutions. While it's unlikely you will get complete BOMs for most COTS items, developing a strong relationship with your suppliers will enable you to acquire the information needed for a proactive OMP.

It is a fact of life: if you have to sustain a system over many years or decades, you will encounter an obsolescence issue that needs to be resolved. Obsolescence must be continually monitored and managed to provide cost-effective long-term sustainment for programs. There is no magic bullet for obsolescence management; it requires work every day to maintain success.

RYAN CARTEE

MATERIAL PROGRAM
MANAGER

RAYTHEON

Please tell us about your professional background.

I've spent my career in the aerospace industry, first with ATK Launch Systems' NASA-contracted Space Shuttle Reusable Solid Rocket Motor program and then at Raytheon, where I've been since 2010. I studied chemical engineering, but always sought roles that challenged my skill set and required a combination of technical savvy and business sense to be effective. Obsolescence management offered a great balance and an incredible challenge, of which I first gained visibility while working on legacy sustainment radar programs in 2014. As a material program manager for obsolescence, I try to draw on experiences in quality engineering, manufacturing engineering, and systems engineering to be effective on the radar platforms that my company supports.

What trends in obsolescence management have you been observing in your industry?

For the past few years, all signs have pointed to large increases in consolidation within the electronics industry, challenging and complicating obsolescence management. Leaders such as Alex Lidow, the former CEO of International Rectifier, have cited increasing costs for developing new chips and slower growth in the semiconductor market as the chief forces pushing us toward consolidation.1 On one hand, this suggests companies are interested in acquiring and maintaining the revenue streams from existing products gained from their acquisitions. The pessimist's parry is that new ownership not only undermines confidence in existing customer relationships, but may also lead to low-margin product lines being culled from the catalog.

What impacts do government regulations have on your obsolescence purchasing practices? Please explain.

My company's commitment to complying with the federal International Traffic in Arms (ITAR) and Export Administration Regulations (EAR) laws definitely shapes our obsolescence strategy. Consolidations of an international nature will only increase the role these laws play for us. While many of our global suppliers facilitate ease of compliance by establishing and maintaining a strong U.S. presence, chip manufacturers that move operations overseas as a result of corporate acquisitions, inversions, or other business decisions inject significant strain on both their supply chain organizations and ours.

Complying with these regulations is so important for defense contractors that it places pressure on our supply chain to take the most conservative pathway and avoid even the possibility of ITAR violations by reducing ITAR-related complexity and working with domestic suppliers, unless there is no other option. The increased lead time to request licenses to export technical data as well as the import of products to our manufacturing facilities in the U.S. requires additional planning, at a minimum, and may not even be feasible given certain program schedules. There is no easy solution to this, but it's a very important element for any manufacturer to consider prior to a move.

From your viewpoint, what should the future of obsolescence look like?

I view obsolescence as a problem of uncertainty. For suppliers, it is the uncertainty of future demand hurting their ability to make the best possible decisions for their product lines and factories. For buyers, it's the uncertainty of supply that erodes our confidence in the supportability and affordability of our systems over their often decades-long lifetimes. I believe improving communication in both directions can lead toward more long-term agreements that reduce uncertainty into quantified, manageable risks that all sides can rely upon to make better decisions for their businesses.

Is there any advice or are there any suggestions that you would like to share based on your experience with obsolescence?

I encourage all parties to strive for negotiating agreements that bridge the gaps between competing priorities. It's going to take creativity, something that we in the mil-aero industry often struggle with, and learning to accept and embrace change. The old ways of managing obsolescence are running into more and more friction, and will eventually become untenable. I think there's a real opportunity for companies that adapt more quickly and creatively to become closely trusted partners. That will mean increased market share for our suppliers and cheaper, more durable systems for our customers.

HOLGER LANGE

OBSOLESCENCE MANAGER

NORD-MICRO A UTC AEROSPACE SYSTEMS COMPANY

Please tell us about your professional background.

At Nord-Micro I am responsible for all aspects of obsolescence management regarding our products. Nord-Micro, a UTC Aerospace Systems (UTAS) company, is the leading low-pressure air systems provider for commercial aircraft. Our product portfolio includes fans and cabin pressure and ventilation systems.

In 2003 I graduated with a degree in aerospace engineering from the University of the German Federal Armed Forces, Munich. After a year with the first-line maintenance of the Tornado ECR fighter bomber wing, I switched to the Eurofighter aircraft. There I started to work as a software engineer for the cockpit subsystems. During this time I was based at BAE Systems in Warton, UK. This was the time when the Tranche 2 Eurofighter development started, which also was driven by obsolescence. When I returned to Germany, my team developed the first German-only software change for the Eurofighter cockpit, which was released to the German fleet. Upon leaving the German Air Force, I joined Nord-Micro as obsolescence manager in 2011.

Experiencing obsolescence issues on the flight line in the fighter bomber wing as a software engineer and project leader (e.g. tool and knowledge obsolescence) gave me a good start in my new profession. Obsolescence management was already established, but the processes had room for improvement. The management supported the improvements, and today I think that I can claim to be known as 'Mr. Obsolescence' in the company. Whenever an obsolescence-related issue occurs, I always get involved.

What trends in obsolescence management have you been observing in your industry?

Obsolescence management is well established within Nord-Micro and the UTC organization. Obsolescence awareness is still growing, and from my point of view there are three trends.

The first trend is related to forecasts. In other industries, long term means five years. But an airliner has a service life of up to 40 years, which significantly changes the concepts of short and long term. Obsolescence is not new for the aerospace industry, especially the military part (just look up "DMSMS"). I

remember visiting the former Airbus plant in Augsburg, where they showed us the wing box of the Tornado, which the German Air Force had bought in great quantity in order to have sufficient spare parts for the Tornado fleet. Ironically, this part was so well designed that there was nearly no demand for spare parts. In the military business, customers are aware of obsolescence and the risks it bears and, importantly, are willing to provide funding for obsolescence management while expecting regular reporting in return.

Now there is even an initiative to fund proactive obsolescence management, which should lead to obsolescence forecast reports. Currently, the customer requires a 100% reliable forecast for the coming two years. Unfortunately, this is not achievable, and the forecasts we receive from the obsolescence databases do not fulfil this reliability requirement.

The second trend is audits and certified processes. The commercial business is also aware that there is risk of obsolescence. Our obsolescence management is regularly on the agenda when our customers audit us, and we always receive best grades for it. Customers expect us to fulfil the IEC/

TS 62239-1 specification, which also covers OM. One customer requires a reporting with a five-year forecast about the reach of last-time-buys. It must be noted that our LTBs are planned for up to 10 years and are synchronized within each product.

The third trend is involvement of subcontractors. Obsolescence management requirements are now more likely to be cascaded down the supply chain to x-tier subcontractors. It does not help if we, as a company, have an A+ rated process when a subcontractor has no obsolescence management and disrupts the whole supply chain. Therefore, we are auditing subcontractors and openly provide best practices to them, which will reduce the amount of firefighting in return.

Are there any industry practices around obsolescence that you would like to see improved? Please explain.

As I already mentioned, awareness has been established, but in reality, when it was time to kick off a redesign due to low stock, we faced lengthy discussions and customer programme managers even asked us to "just buy more parts". Those statements proved to me that some of our customers have not understood the nature of obsolescence; it cannot be avoided, but its effects can be controlled and mitigated.

At the end of this case we were able to obtain all the necessary components, but great effort was required. Nine different components at a specific quantity were needed, but if one of them had not been available, the whole process would have been disrupted. Moreover, all the components had to be thoroughly tested to ensure that no counterfeit parts entered the supply chain. The costs for extending product life for a bit more than a year summed up to an amount which was 50% of the proposed redesign.

We are able to provide schedules for planned obsolescence-driven redesigns for each product for the next 10 years. I would be happy to provide these to our customers. This transparency should avoid issues and the necessity to buy components at extreme prices from the "grey" market. Besides solving the obsolescence issue, redesigns could also allow us to insert technology, add new features, and benefit from innovations in a planned way.

This can all be summed up with a single statement: "Transparency and communication between supplier and customer still have room for improvement."

What changes would you like to see chip manufacturers make to address future obsolescence challenges?

Obsolescence will always happen as long as there is innovation. Therefore, innovation and obsolescence are just two sides of the same coin. Industries which are highly innovative will always face a high obsolescence risk. I would like to see more OCMs (original component manufacturers) turning to the high-reliability market, which might not be as innovative but can offer reliable demand.

Maybe it would be helpful if the electronics market would diversify even more into these segments; but then we, the customers, will have to demand this from our suppliers and be willing to pay for this service.

There are aftermarket manufacturers, which are not a real solution for us because we react on end-of-life (EOL) notifications and product-discontinue notifications (PDNs). At this point in time, buying from the OCM is

still possible, and it is not clear whether and at what cost an aftermarket manufacturer will be able to support us. Either the OCM tells us which aftermarket manufacturer will continue the product, or we are able to agree on a long-term delivery contract for the LTB for at least five years.

Nonetheless we, the customers, have to accept a higher price, which may still be cheaper than the capital costs for storing big quantities and the risk of the components degrading while in stock. Whether this is possible remains uncertain when considering the bargaining power of the aerospace industry in the electronics market.

Specifically, what effect will the wave of chip manufacturer consolidations have on obsolescence?

First, the consolidating companies benefit by merging administration, purchasing, logistics, and other departments. Afterwards they start cleaning the product portfolio, which in my opinion will result in a strong EOL wave that is about to hit us.

What impact do government regulations have on your obsolescence purchasing practices? Please explain the differences.

Sooner or later the REACH and RoHS exceptions for the aerospace industry will come to an end, so that obsolescence not only in electronics but especially in chemicals used in the production process will become an issue. Our company has an explicit task force to engage this challenge proactively.

As this is an industry-wide problem. I expect that there will be a general solution because our customers will have to approve the changes we need to continue delivering our products.

From your viewpoint, what should the future of obsolescence look like?

If obsolescence ceases that would mean that innovation has ended. In contrast to the mergers in the OCM world, I hope there will be a better diversification between consumer and high-reliability/longevity markets. Those OCMs in high reliability/longevity will use the NRND (not recommended for new design)

flag more transparently.

Is there any advice or suggestions you would like to share based on your experience with obsolescence?

Generally, keeping obsolescence management a secret will not help. The customer will not understand the problem; subcontractors will not be able to reach the desired level of stability. Experience should be shared so that it becomes clear that obsolescence cannot be avoided, but its effects can be controlled and mitigated.

More specifically, I would like to suggest to aftermarket distributors that they facilitate my work not only by offering parts, but also by being able to handle the anti-counterfeit testing according to the AS5553 standard. Another suggestion I can give is to make the cooperation between OCMs and aftermarket manufacturers more transparent. There are already alliances, but these are not transparent. When an OCM discontinues a component for financial purposes, it would be beneficial if the aftermarket manufacturer is informed, which would allow them to continue providing this product. Ideally, this principle should be included in the EOL/PDN.

PETER SANDBORN

PROFESSOR,
MECHANICAL ENGINEERING

CALCE, UNIVERSITY OF MARYLAND

Please tell us about your professional background.

I have been a professor at the Center for Advanced Life Cycle Engineering (CALCE) in the Mechanical Engineering department at the University of Maryland since 1998. Before that I worked in the electronic packaging industry at a research consortium in Austin, Texas, and as one of the founders of an electronic design automation company named Savantage. I was introduced to electronic part obsolescence by Honeywell in the late 1990s, and we initially worked with Aspect Development to develop the first data mining–based obsolescence forecasting algorithms. Since then, my research group has developed and extended obsolescence forecasting algorithms for many of the current parts database companies; developed lifetime buy models; and created cost models for many aspects of obsolescence management. My group is best known for strategic refresh planning for systems subject to obsolescence, and we've worked with a broad range of commercial and military organizations in the United States and Europe.

What trends in obsolescence management have you been observing in your industry?

One trend I've seen is a broadening of the scope. It's been slow in coming, but there is a recognition amongst practitioners, managers, and customers that obsolescence management is about more than just managing electronic piece parts. Mechanical parts, software, materials, and workforce are all important system components that must be tracked, forecasted, mitigated, and managed, too.

Another trend is a broadening of the base. Diminishing Manufacturing Sources and Material Shortages (DMSMS) management was once the exclusive domain of military and aerospace, which expanded to include rail, industrial controls, power generation, oil and gas, and others. However, new folks are showing up every day. For example, medical electronics and renewable energy are beginning to ask the right questions.

Are there any industry practices around obsolescence that you would like to see improved? Please explain.

A resilient systems view is needed. Resilience is the intrinsic ability of a system to resist disturbances, but everyone views the problem with a different 'scope'. Designing resilient hardware and software (which is the focus of most resilient design activities) is necessary but not sufficient for creating resilient systems. System resilience requires 1) reliable (or self-managing) hardware and software; 2) a resilient logistics plan (including supply chain and workforce management); 3) a resilient contract structure; and 4) resilient legislation (rules, laws, policy). This represents a broader scope than what is generally articulated. In practice, however, neglecting any of these elements potentially creates a legacy system with substantial (and potentially untenable) life-cycle support costs. Obviously obsolescence management has to be part of this picture.

From your viewpoint, what should the future of obsolescence look like?

Hopefully the future is more strategic than the present. Today, the majority of obsolescence management is reactive. While some organizations are able to adopt proactive programmes that identify and plan for the obsolescence of particularly problematic parts, which is good, this is not strategic. Strategic management means that you actually plan and manage the life-cycle of the system (not the life-cycle of the part).

Unfortunately, strategic management comes at a price. While it is often argued that organizations are unwilling to pay now to avoid costs later (i.e. cost avoidance is a harder sell than cost savings), this isn't necessarily always the case. The bigger problem may be that engineers are unable to articulate or quantify a business case for strategic solutions. Making the business case requires determining cost avoidance ROIs. DMSMS management groups will always spend time resolving (mitigating) problems. This isn't going away. But the culture of management organizations needs to shift to a focus on problems avoided through system life-cycle planning and management.

Are there any game changers on the horizon?

I suspect that the biggest game changer is going to be the wider use of outcome-based contracts. Real (all-inclusive) outcome-based contracts exist in the commercial world (e.g. leasing a copier) and in power generation (e.g. power purchase agreements), but have been only slowly adopted in military and aerospace. Today's system-level PBLs in the United States are a long way from being truly outcome-based contracts. These contracts, if fully implemented, don't shift responsibility for obsolescence management as much as they shift the liability for incompetent obsolescence management. In many commercial product settings, the customer does not know what obsolescence is (and quite frankly does not care), and its management is completely the responsibility of the OEM.

We have created a contract engineering research focus at CALCE. Contract engineering is the integration of engineering design and contract design. Contract engineering is not a payment structure based on a range of outcomes (e.g. availability); rather, it is a combination of contract mechanism design, contract theory, and the co-design of the contract requirements and the system. The objective is to identify the feasible regions of design that minimize the risks for both the contractor and the customer.

Your group has focused much of its attention on understanding and forecasting the cost ramifications of obsolescence and obsolescence management. What is the vision here?

In our world it's all about understanding the cost ramifications of your decisions. This includes 1) understanding that part purchase price is often not a significant contributor to the total cost of ownership of a part selection decision; 2) understanding part storage and handling costs; 3) understanding the end-of-support date for your system and the likelihood that it will change; and 4) understanding who owns the life-cycle costs. In the ideal world, designers would have the ability to obtain an effective life-cycle cost estimate associated with a part selection decision when they first

consider the part for inclusion in their system.

The most common question posed to us is "Can you make me a business case I can take back to my management or the customer?" There are lots of smart engineers with lots of deep supply chain and obsolescence management experience; they often know what the right thing to do is, but are unable (or do not have the tools) to make a business case to sell it to management. As a result, the default becomes business-as-usual, reactive firefighting. If the tools and capabilities were available to make viable business cases for strategic solutions, more strategic solutions would be put in place.

What role can/should universities play in obsolescence management?

Unfortunately, engineering and business students generally receive little or no exposure to aging systems (including obsolescence management). Traditionally, student focus is on the design and manufacturing of new things, and gives little or no thought to sustaining the things they design. I'm always surprised by how many engineering students can't provide a technical definition of 'reliability', let alone articulate any real-world aging supply chain problems. The problem is that eventually these students become the people who influence how systems are funded and managed. The earlier we can socialize these students to the issues of system sustainment and obsolescence, the better.

From a research perspective, universities can potentially provide state-of-the-art predictive analytics that can be brought to bear on obsolescence date and risk forecasting problems. Additionally, advanced numerical simulation methods could be applied to optimize and better understand obsolescence management decisions. However, the role of universities is facilitated by funding, access to data, and awareness and appreciation of the problem – and all of these elements are lacking today.

BILL RAMSDALE

EMEA AEROSPACE AND
DEFENCE SALES MANAGER

ARROW ELECTRONICS

Please tell us about your professional background.

I left school at the age of 16 and took a traditional four-year engineering apprenticeship with a small manufacturer of machine tools. After that, I spent a further three years at the University of Liverpool seeking a degree in electronic engineering.

On completion of my degree, I joined LiteOn Automotive as European technical manager. I ended up spending 14 very happy years with them, working on a range of different aftermarket and original equipment applications. These applications included vehicle security, cruise control, sunroof controllers, and tire pressure monitoring systems. In 2007 I joined Arrow Electronics as the UK's automotive field application engineer, changing roles in 2009 when I was asked to take responsibility for the UK aerospace and defence market. Five years later, in 2012, I was promoted to European, Middle East and Africa aerospace and defence sales manager.

What trends in obsolescence management have you been observing in your industry?

I haven't seen a significant change in the way obsolescence is managed since I became involved in the aerospace and defence market. The consideration of obsolescence issues is often left until the last-time buy notification. Calculating the cost of obsolescence focuses on the options available to support the programme after the product is no longer available from the original component manufacturer.

This approach to obsolescence management is limiting, preventing the innovative thinking required to develop better solutions.

Are there any industry practices around obsolescence that you would like to see improved? Please explain.

I would like to see improvements in and more involvement of design engineering in obsolescence management. The responsibilities of the design engineer are increasing all the time. The focus remains for companies to reduce the time to market. Arrow has made significant investments in arrow.com to address this need. Our online design centre features interactive development tools, an extensive database of editable reference designs, and thousands of state-of-the-art technical articles and videos. Engineers who would like personalized help with their design questions can reach out directly to our pool of specialist engineers via e-mails, phone, and even video chat.

The need to reduce the time to market, however, cannot come at the expense of other critical design issues. There is an ever-increasing list of 'design for' challenges to be addressed, and the first step of any obsolescence management plan must come at the design stage.

A bill of materials review – including parts classification by risk and impact, culminating in a strategy to either multi-source or ensure clear life-cycle data is available from the manufacturer for any part identified as an 'obsolescence risk' – is a process the Arrow

field sales and field applications engineers are available to support, and I believe it is a step often overlooked.

What changes would you like to see chip manufacturers make to address future obsolescence challenges?

We would probably all like to see a non-obsolescence policy from all component manufacturers, but I think we will continue to be disappointed. There is a feeling that obsolescence is something forced on the industry by the component manufacturers. I think we need to look a little closer to home.

As consumers we expect the 'next generation' or 'next upgrade'. Innovation is key, and if a company fails to innovate, we simply stop buying their products.

So for our customers, innovation means creating better cars, better homes, better planes, better hospitals, better … just about any device that takes a charge. At Arrow Electronics it is all about 'Guiding Innovation Forward', helping designers, engineers, and partner companies create all kinds of tools and apply technology in new ways to create these better products we all want to buy.

The same is true for the component manufacturers. We expect them to develop the next generation of components for the better products we all want to own. As the demand ramps up for these next-generation components, it is an inevitable consequence that component manufacturers will need to make difficult commercial decisions. Manufacturing capacity is finite; the cost of increasing capacity in the short term is often prohibitive, which inevitably leads to the obsolescence of older or legacy products.

Component manufacturers may well have an important role to play as we look to develop innovative end-of-life solutions which are both commercially viable for customers and profitable for suppliers to deliver, but I don't believe it is reasonable for us to expect solutions which address future obsolescence challenges to come directly from the component manufacturers.

Specifically, what effect will the wave of chip manufacturer consolidations have on obsolescence?

I think we are already starting to see the effects with the LTB announcement last month from Intel for the legacy Altera FPGAs. I would expect this to be one of the first of a number of similar announcements.

Predicting obsolescence is never easy, and the best models typically work on modelling both the technology trends and the behaviours of specific manufacturers. The mergers and acquisitions we have seen over the past 18 months will certainly change the behaviours upon which these models are based, and therefore will create unplanned and/or unexpected cases of obsolescence which will challenge everyone involved.

From your viewpoint, what should the future of obsolescence look like?

Any truly effective obsolescence management solution needs to be an end-to-end solution, and it needs to be driven, or at least sponsored, by the

highest level within a company. As long as the subject of obsolescence management remains bounded within the component engineering and procurement departments of a company, the solutions available will remain limited.

I also believe it is critical for any company to share information clearly and openly, both internally and externally, with key strategic partners within the supply chain. As long as information share is limited to requests for quotation, forecasts, and long-term trading agreements, suppliers can sell you components but they can't support, develop, or implement the key services needed to help deliver a cost-effective, end-to-end obsolescence management solution.

For me that's the future of obsolescence management – companies looking to develop optimized obsolescence management solutions, sharing data (however imperfect) both internally and externally with strategic external partners, to allow more effective decisions to be made at the critical moments, to ensure obsolescence management is delivered more efficiently and more cost-effectively.

Future of Obsolescence Management