



# Asset Performance Management

*An Interview with an Accomplished Reliability Professional*



Margaret Wilson leads USC Consulting Group's World Class Asset Management Practice. In this role, she ensures that the USCCG team is trained and certified in the best reliability and maintenance management techniques and method-

ologies. Margaret received her Bachelor of Science degree from the United States Military Academy. After graduation, she served in the U.S. Army, where she attained the rank of Captain. Prior to joining USCCG, Margaret spent over 15 years as maintenance leader in the U.S. Army and with three Fortune 1000 companies.

**METRICS:** *What is asset performance management and why is it important enough to be a C-level responsibility?*

**MW:** Asset performance management is the management of all the assets required to

produce the product or service that an organization is responsible for. It includes everything from the fleet equipment in a distribution company, to the production equipment in a steel plant, to ensuring the reliability of human assets to drive revenue in a service organization. Obviously, with that definition and criticality, it's a C-level responsibility.

**METRICS:** *What is the impact of improved reliability on EBITDA?*

**MW:** There are two ways that reliability will favorably impact EBITDA. One is by reducing the cost of maintaining the assets, which is generally where organizations focus first. But another important area is being able to increase the production or, output, of those same assets. This is actually where you get the biggest bang for the

buck because your cost-per-unit can be driven down significantly by impacting the numerator of that formula. So if your products are in demand, if your assets are performing at the level you expect them to perform, you'll have a lower cost of sales.

**METRICS:** *Is this consistent across various industries or does it vary by industry?*

**MW:** It's consistent across industries. Now the extent of its impact on EBITDA depends in large part on the ability of the assets to produce more than they're already producing. Additionally, if an organization capitalizes a lot of their assets because of design changes, that capital expense won't necessarily be impacted by improved reliability. However, every organization should be looking at reliability as a way to improve EBITDA.

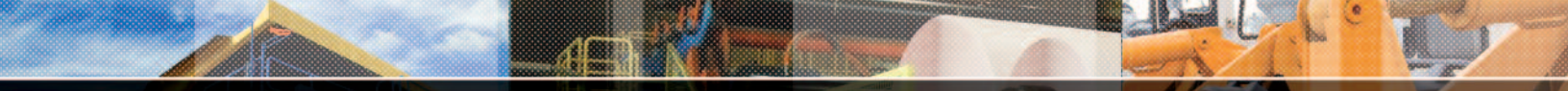
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**METRICS:** *What are some of the common misconceptions about physical asset management?*

**MW:** The most common misconception is that the way to maintain equipment is to rebuild or restore it. Physical asset management should examine the business case for each potential corrective action based on the condition of the equipment. What this means is that, for some equipment, the best option would be to run it to failure. Other types of equipment will likely have other types of corrective action. But, bottom line, most organizations think of maintenance as costly because they're going to restore or replace equipment as it fails.

**METRICS:** *How does a physical asset management program differ from a maintenance program?*

**MW:** Most maintenance programs think one of two ways; either they intend to fix it before it fails, which is actually not possible in most cases, or they wait until it fails and fix it after it's broken. A physical asset management program looks at assets in a holistic manner in terms of their business requirements, and functional requirements, the context in which they operate. It then determines appropriate tasks to do from a maintenance standpoint to keep them functioning at the level the organization needs, either for business reasons or out of cost considerations.

**METRICS:** *Can you give me an example of an operating context?*

**MW:** That's a great question. An operating context describes how a piece of equipment operates in an organization. This is where you set aside the equipment manufacturer's perspec-

tive and study how that piece of equipment's actually being utilized. This can cause you to have different action plans for the same type of equipment in the same organization. An example would be an overhead crane in a steel mill that is moving raw material from the loading dock into the furnace area. Its operating context is not very harsh versus the overhead crane that is working in the blast furnace under conditions of extreme heat. They will very likely require two very different approaches to maintenance.

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***“The most common misconception is that the way to maintain equipment is to rebuild or restore it.”***

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**METRICS:** *What are some common mistakes made in reliability and how do you avoid them?*

**MW:** I previously cited some of the mistakes commonly made. These include not looking at a piece of equipment's operating context, having a PM program that's exactly the same for two different types of equipment, thinking that the best way to maintain a piece of equipment is by trying to predict when it will fail, using Meantime Between Failure as a gauge to determine the frequency with which work should be scheduled or completed. And they're several others. The big thing here is to avoid them, and the way to avoid them is to do a thorough Maintenance Task Analysis that includes the operating context, the functional requirements, and an analysis of all the ways that equipment can fail.

**METRICS:** *Do most organizations have the capability to do this internally or would they normally have to go outside for this kind of expertise?*

**MW:** It is very possible for an organization to develop these resources internally but it is highly unlikely that they have the resources in-house. Additionally, going outside has the benefit of providing a more objective view that will help overcome some of the existing paradigms, particularly in a fairly mature maintenance organization. Without an RCM facilitator who knows how to ask the right questions, the organization is likely to perpetuate its existing maintenance practices and mistakenly feel it's done the required analysis.

**METRICS:** *Margaret, you used the term RCM, can you tell us what that means?*

**MW:** RCM is an acronym for Reliability Centered Maintenance. I also used the term RCM2 which is the second generation of RCM. RCM was originally developed by the airlines in the 70s to help prevent aircraft from falling out of the sky. The second generation, RCM2, developed by John Moubray, and further enhanced through the Aladon Network, is the same basic Reliability Centered Maintenance with the addition of environmental and safety components.

**METRICS:** *Margaret, are RCM and RCM2 part of asset performance management or vice versa?*

**MW:** Yes, they are part of asset performance management. As I described earlier, asset performance management is a program that looks at the business require-

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ments and functional requirements of a company's assets and ties the two together. RCM2 analysis is how you develop the program once the business case and the criticality of the assets are understood. You may be familiar with some of the other concepts including Failure Effect Modes Analysis, Maintenance Task Analysis, and JA101101 from the nuclear power industry. They represent a disciplined approach to understanding how equipment will fail, and to determining the appropriate action to take to mitigate or prevent the failure.

**METRICS:** *Margaret, can you explain the difference between business requirements and functional requirements?*

**MW:** Business requirements may say that a piece of equipment needs to produce one hundred wickets. Functional requirements specify that it needs to produce one hundred wickets, with one operator, at a pace of ten per minute, with a less-than-one percent reject rate, once the business case and the criticality of the equipment is understood.

**METRICS:** *What are some of the dos and don'ts when it comes to asset performance management?*

**MW:** Starting with the don'ts – don't think this is a responsibility that can be pushed down to engineering so that they become the owners and the operations group has no role other than being their customer or that of the reliability department. That's probably the biggest mistake organizations make. One of the dos is understanding that this is a vital part of any organization's success and it should have high-level sponsorship and ownership, and that it needs to

be a total company philosophy. Reliability is not just about mechanics turning wrenches; it's about how operations operates the equipment, and management makes decisions around scheduling, planning and deployment of resources to help an organization accomplish its mission.

**METRICS:** *What are some of the consequences of asset failure and how can I avoid them?*

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**“... asset performance management is a program that looks at the business requirements and functional requirements of a company's assets and ties the two together.”**

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**MW:** The primary consequence of asset failure is that your equipment will not be available to produce what you need it to produce. Lagging consequences can adversely impact the safety and environment of the area you're working in, and even reduce the life of the asset so that you have to spend more money on capital down the road. To avoid it is to understand how equipment can fail, have action plans in place to identify potential failure as early as possible, and have mitigation plans in place to correct the root cause of whatever's creating that failure or potential failure.

**METRICS:** *How do I go about prioritizing activi-*

*ties based on time, capital requirements, or ROI?*

**MW:** That's the basis of a reliability program where you identify business requirements, functional requirements, the consequences and probability of failure. This will give you a ranking, by asset, of your most important assets from a business requirement standpoint. The business requirements look not only at the cost of operation of the equipment but also the profitability of the equipment. So the beginning part of an RCM program, if executed properly, will help you prioritize your equipment.

**METRICS:** *Can you give me an example of a higher- versus lower-ranked asset within a specific industry or circumstance?*

**MW:** An example of a higher-ranking piece of equipment could be a plant's electrical system. The consequence of main switch gears failing is significant in that it impacts all of the production equipment. The probability of failure, however, may be lower because there are fewer ways for that piece of equipment to fail without some sort of special cause or intervention. On the other hand, you could have a pump that serves a single line. The consequence of failure is lower than the main switch gear because it only impacts a single line, but the probability of failure could be higher because it has over time, failed repeatedly. Plus, its operating context is a very harsh, aggressive, environment that will require more maintenance-type intervention.

**METRICS:** *What can I do to jumpstart my reliability initiative?*

**MW:** There may be no need to jumpstart

it, rather just a need to add critical resources. On the other hand, you may be going down the wrong path and need to redirect your resources. My recommendation is to have an RCM business analyst and practitioner come in and complete an assessment of your program as it stands right now and then work with you to determine the best way to accelerate it, if at all.

**METRICS:** *How do I create and sustain a reliability culture?*

**MW:** First the organization needs to embrace reliability at the highest level. As we've discussed before, it's a C-level responsibility and it trickles down from there. That's going to create a reliability culture. In order to sustain a reliability culture, it's important to have the right level of training and certification, as well as visibility to the leading and lagging indicators showing that the culture is perpetuating the right behaviors.

**METRICS:** *How extensively should I empower my people to take ownership of our asset performance management program?*

**MW:** You should empower your people to manage and execute the program so long as you don't abdicate responsibility and ownership at the C-level. As soon as they think reliability's not that important to you, they'll have a very difficult time sustaining it, even if they believe it's the right thing to do.

**METRICS:** *You've referred to leading and lagging indicators a couple of times in this interview; can you give us some common examples of each please?*

**MW:** Examples of leading indicators might be schedule attainment to planned work orders, the number of work orders created due to a PM inspection, PM inspections that lead to corrective action. Lagging indicators typically include OEE, throughput, dollars spent per-unit-produced. Like production, maintenance or reliability has similar leading and lagging indicators. It's also important to understand that some leading indicators will become lagging indicators as they move up through an organization's hierarchy.

**METRICS:** *How do I mitigate against losing skills and knowledge to an aging workforce?*

**MW:** An important aspect of a reliability program is documenting the operating context, functional requirements, the way equipment will fail, and corrective action to be taken as potential failures are identified. So, one of the side benefits of having a solid reliability program is that all this information is documented and can be easily transferred as a workforce starts to turn over. Instead of this knowledge residing in somebody who's worked for the organization for 30 years and is about to retire, it now resides not only with that individual, but with all the individuals in the organization who participate in the analysis, as well as in the documentation, of the RCM program.

**METRICS:** *Can reliability complement my company's safety and environmental compliance programs?*

**MW:** Reliability complements your safety and environmental compliance programs because a key component of it is the understanding of how equipment will fail. There are very few cases of a safety or environmental issue that are not the result of

some asset failing to perform in the manner it was expected to perform. Another critical component of this is a detailed RCM analysis that will look for hidden failures and how hidden failures can be determined, and the major catastrophic failures that have occurred over the last ten years. I'd venture to say that the majority of them are caused because of a hidden failure that happened some time prior to the snowball effect which ultimately resulted in the safety or environmental problem.

**METRICS:** *What do I need to be doing differently to fully internalize the concept and execution of reliability in my organization?*

**MW:** As I've stated many times, the C-level needs to take ownership and recognize reliability as one of the most important aspects of their business. From there, it's going to have a trickle down effect. But making sure it happens really starts with having RCM practitioners and people who have successfully implemented RCM programs in the past help your team implement its program and put into place enabling tools that will sustain it. So, it's more than just saying we've got to go and win the Super Bowl, it's having the coaches and resources train the team to be able to execute it at world class levels.

**METRICS:** *If I do everything you say, what's in it for the stakeholders?*

**MW:** They'll see an increase in the bottom line profitability of the organization which represents somewhat of a paradigm shift because most people think of maintenance as being a necessary evil or the cost of doing business. Looked at through the reliability prism, it can really become a profit

enhancer or enabler so that the stakeholders see an even greater return on their investment.

**METRICS:** *How will customers benefit?*

**MW:** Customers will benefit to the degree that you pass the cost savings on to them but, more importantly, they'll also benefit from a higher level of customer service. Because your assets are more reliable, you'll be able to shorten the lead time requirements for them and have a higher predictability that your product will be delivered at the cost they expect. And this is an important aspect of the culture for any organization that's looking to continuously improve. Being able to have their assets work for them and be reliable will only help your other continuous improvement processes.

**METRICS:** *Does successful implementation of an asset performance initiative represent a sustainable competitive advantage?*

**MW:** Absolutely. As I mentioned earlier, more reliable equipment will not only allow you to produce at a lower cost, but also be able to reliably predict when products or services will be available, which is a competitive advantage for anybody. Being able to lower your costs, reduce the lead time requirements for your customer, and improve quality are all things that improve the value equation to make you more competitive.

**METRICS:** *What if I don't have adequate resources in house, where should I turn and what should I look for with respect to third party qualifications?*

**MW:** It's important to understand that you likely do not have adequate resources in-house. You may have one or two key players, but to roll out a reliability program at the corporate level, you'll need critical mass, at least during the kick start of this culture change. The best place to turn would be to a world class consulting organization that has experience with the business conditions you are facing. Industry experience is not nearly as important when it comes to understanding how reliability will impact your bottom line. In terms of looking for third party qualifications, you definitely want someone that belongs to the Aladon Network because that is the only certifying organization for second generation RCM. You'll also want to look for an organization that has sufficient band-width to ensure that all your reliability needs are met.

## New Addition Brings Strong Business Acumen to Regional Sales Team



Trent E. Halford, 37, has been hired by USC Consulting Group, LLC (USCCG) as business development executive for its Mid-Atlantic/Southeastern U.S. region. Mr. Halford has more than ten years' experience with world class companies, proven ability, and recognized success, in achieving strategic objectives in marketing, finance and operations, leading to both top and bottom line growth.

Most recently he was in corporate lending with GE Capital where he originated transactions and championed a cross-sell team representing five different GE commercial finance businesses to deepen customer relationships and generate incremental revenues. He was recognized for his Lean Six Sigma workout contributions, including implementing process

improvements that reduced deal cycle time and increased productivity. Mr. Halford is a certified Six Sigma Black Belt skilled in project management, strategic planning, process improvement, and the change acceleration process. He is adept at driving continuous improvement, along a critical path, to achieve business objectives.

According to Eric Clerk, USCCG senior regional manager for the Mid-Atlantic/Southeastern U.S., "Trent brings strong business acumen and a financial perspective, plus both process and analytical skills, to our business development team."

Mr. Halford, who holds a Bachelor of Science degree in Environmental Science from the University of Georgia, earned an MBA and M.S. in Finance at Georgia State University. He resides in Atlanta, GA.

# Fine-tuning Your ERP System

By Paul Harker, Senior Operations Manager, USC Consulting Group



Paul Harker is a Senior Operations Manager with USC Consulting Group (USCCG). In this role he delivers projected operational and financial improvements in the course of managing multiple client engagements. During his 20 years with USCCG, Paul has been successful in implementing continuous improvement programs with emphasis on cycle time reduction, inventory and materials management, effective resource utilization, customer service, demand flow processing, logistics, Sales & Operations planning, plant relocation, and project management. He is the author of a series of articles entitled *Fine-tuning Your ERP System*.

At this moment, chances are good that your Enterprise Resource Planning (ERP) system is sending false signals throughout your supply chain, inflating inventory across the network, frustrating customers and suppliers alike, and damaging the overall health of your organization. If you are in this very large and surprisingly quiet club, your ERP is not tuned to the operational needs of your business, and worse, may never be.

In a three-year survey, published in January of this year by ERP specialists Panorama Consulting Group, only 21% of 1,322 respondents reported that their ERP implementation got them even one-half of the projected benefits. Yet, in spite of that dismal performance, satisfaction ratings average in the mid-70s!

Let's put those two sets of numbers together. Nearly 80% of these companies got less than one-half of the value they paid for, yet over 75% report that they are pleased with the implementation. How low have expectations fallen? If we do not bridge this expectation gap, the prospects for your ERP ever meeting your business needs are not good.

## ERP as a Value Driver

Purveyors of ERP systems large and small have rightly identified a wide range of

potential benefits. Frequently, a major value driver is improved velocity of inventory throughout the supply cycle. Raw material arrives on a timelier basis, work-in-process inventory is reduced, and finished goods inventory is right-sized for excellent customer service, while minimizing the dollars invested. If your starting point is particularly poor, these objectives may well be achieved. Ironically, the better your materials organization is managed, the less likely you will find your inventory performance to be dramatically improved.

Over the course of our 40 plus years of helping clients toward operational excellence, we have found three primary shortcomings with ERP systems. The first two you have almost certainly encountered; the third is rarer.

## Leveraging Inventory to Smooth the Supply Chain

One of the core functions of your ERP is to match supply to demand through Materials Requirements Planning (MRP). The MRP module suggests planned supply orders that are offset by the replenishment lead time in order to synchronize supply to demand. This all works very neatly.

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However, the unpleasant side effect of this raw calculation is that it transfers the volatility of demand directly onto the supply chain.

The accident of having, or not having, inventory does in fact accelerate or retard the supply order, but the use of inventory to actively buffer volatility in demand, and smooth the supply chain, is not executed here. Rather, inventory is the result of hundreds, or thousands, of independent calculations of SS levels, lot sizes, and lead times. These parameters are directly tied to the item itself, but are de-coupled from the balance of supply and demand.

In essence, inventory is ignored in these calculations and is expected to remain at a constant level over time. That constant level is driven by the planning parameters attached to the part, not the capacity of the processes, the needs of the customer, or the financial health of the organization. Would you assume that suntan lotion, BBQ grills, lawn mowers, and farm implement inventories should remain constant throughout the year? Neither do the people that make them successfully.

Mature, stable, and narrow product lines are largely a thing of the past. Transmitting the volatility of the market throughout the supply chain drives high cost and poor performance. Simple and effective techniques to minimize that volatility are within the reach of any organization. In the first of a three-part series of articles on *Fine-tuning Your ERP System* we will examine the means to use a Sales & Operations Planning process to convert your investment in inventory from a drain on cash into a strategic driver of cost reduction and customer satisfaction.

### Missing Tools for Inventory Management

In spite of having a Materials Requirements Planning (MRP) module and a suite of

inventory reports, ERP systems have a notoriously difficult time answering three pretty basic questions:

- How much inventory should we have?
- To what level do our current parameters drive us?
- How many of our items are currently outside the guidelines we have set?

Because the organization cannot quantify specifically where it is driving its inventory, there tends to be a lot of frustration over managing it. Consequently there is a lot of activity focused around managing inventory that is poorly directed and which produces disappointing results.

The second in a series of three articles on *Fine-tuning Your ERP System* will describe a mechanism to create a common language between the many stakeholders in inventory investment that sets clear and achievable expectations from the newest buyer/planner to the corner office.

### Repairable Parts Pool Sizing Model

The third shortcoming involves the special case of our friends in large asset overhaul and remanufacturing. This includes those who do line or base maintenance on aircraft, tanks, Humvees, and fighting vehicles of all varieties. These can be as complex as turning around a space shuttle for its next flight, or as innocuous as replacing the starter on a 1991 Honda Accord. These organizations require inventory both to replace parts that are worn beyond repair and for those that can be refurbished.

Because those are two very different situations for the same part number, a configuration decision must be made. ERP systems are excellent planning tools. They can be well tuned to execute a time-phased replenishment of a part that is due to exceed its service life limit.

Additionally, if the scrap rate due to wear and tear prior to reaching the service life limit is relatively stable, your ERP is built to respond to this as well. However, some decision support is needed to examine the impact of a number of scenarios and to select a strategic direction to pursue. The last in a series of three articles on *Fine-tuning Your ERP System* will describe a tool and methodology to impact this high-dollar inventory investment.

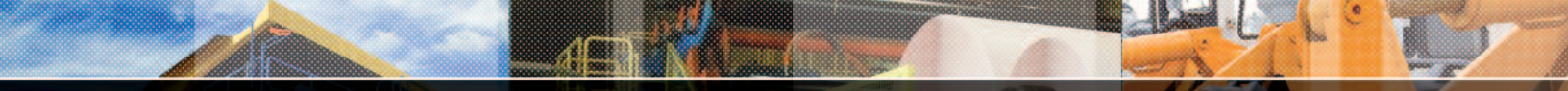
### Wrapping Up

Your implementation, if particularly current, may have successfully overcome one or more of these common deficiencies. However, it is far more likely that your organization has either built a workaround, or has resigned itself to the fact that this important business capability simply doesn't exist.

Your success as an organization is driven by the strength of the personal experience of your materials group. If you are the optimistic type, you may have hope that it will be handled in your next upgrade or in the next ERP implementation. Perhaps you're simply tired of waiting.

'Open architecture' remains something of an oxymoron in the ERP universe. The time and expense to have a solution customized is prohibitive. There is however increasing ability to reach into databases, process the mined data, and generate valuable nuggets of actionable business intelligence.

These mechanisms can be quickly configured and implemented without customization, and can be invaluable when it comes to fine-tuning your ERP to meet the needs of your business.



*First we make it work. Then we make it last.®*

For more information contact us at **800-888-8872** or [www.usccg.com](http://www.usccg.com)

Metrics is a publication of USC Consulting Group, LLC, specialists in business performance improvement. In coming months you'll read more about how USCCG works and how we help executives go about the process of significantly improving their organizations.

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