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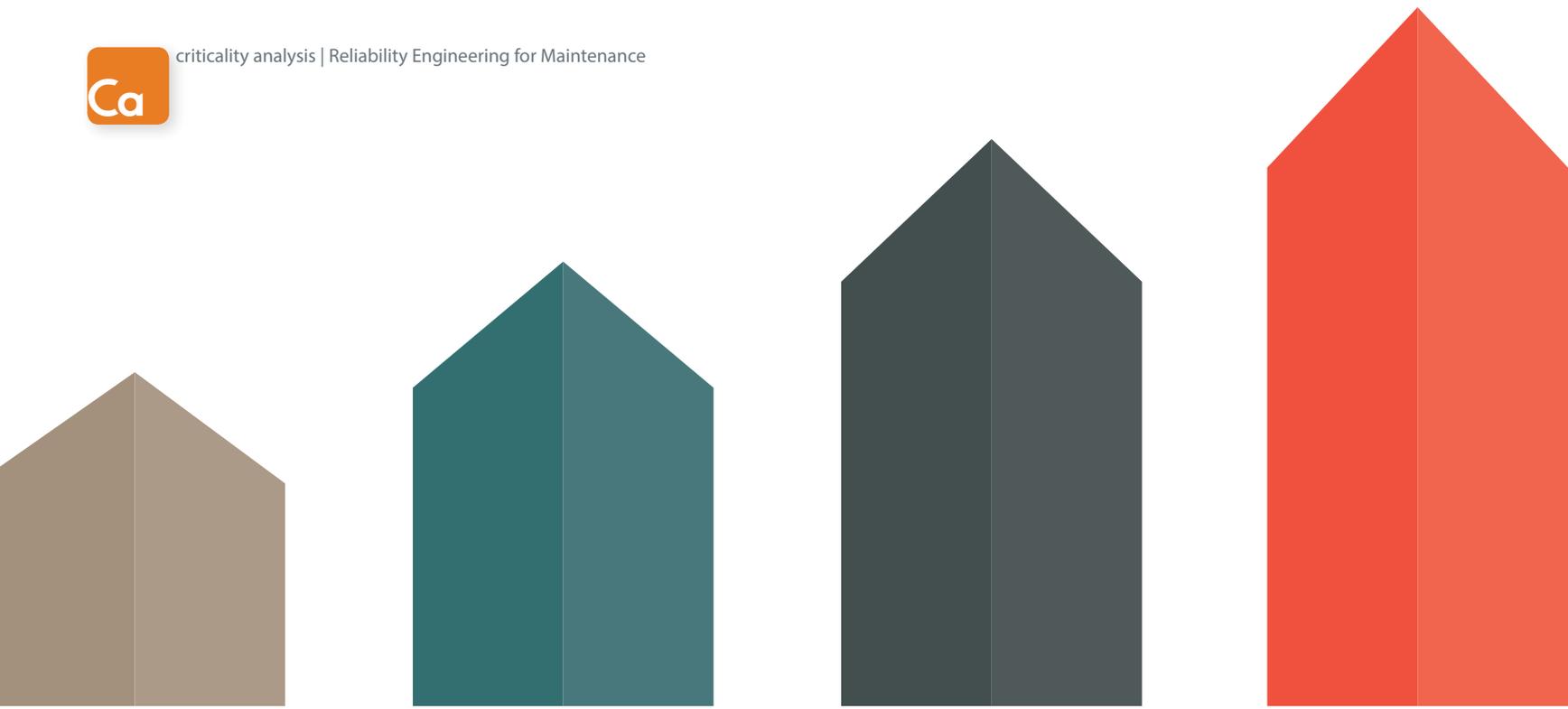
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Asset Criticality Ranking



Value for Each Management Level

by Ralph Tileston

Asset dependent organizations need to be continually educated and diligent about the importance of classifying assets in terms of the impact of asset failure on the organization. By using a prescriptive method to identify and classify failure consequences, organizations can most effectively allocate asset care resources within their enterprise asset management (EAM) model. Within the reliability-based maintenance (RBM) asset management model, this prescriptive means is a facilitated process called asset criticality ranking (ACR).

Using a list of all assets to be managed, ACR defines the relative importance of asset failure consequences to the overall business. This is accomplished by evaluating asset failure consequences against graduated criteria within several business impact factors. Typically, the business impact factors

of safety, quality, throughput and cost are used for an evaluation, but ACR is unique from other asset criticality assessment tools because it allows for a completely customizable format. ACR recognizes input from a variety of sources, but is primarily a facilitated dialogue between subject matter experts (SMEs).

Regardless of the business impact factors and criteria applied, ACR results in a numerical criticality score for each asset, which then can be put to use in a variety of ways, from daily maintenance workflow management to capital project funding decisions. The ACR numerical results can be scaled and grouped, making it possible to classify the asset groups by their functional importance to the business, such as non-essential to operations, essential to operations and critical to operations (listed in groups of least critical to most critical, respectively).

Table 1 – ACR usefulness to other areas in an organization

Department	Information	Benefits	Preparations
Engineering	Bad actors list by criticality	Candidates for replacement, reengineering or PM optimization	Detailed review from most critical to least
Finance	Bad actors list by criticality	Budget preparation	Equipment replacement schedule based on engineering recommendation
HR/Training	ACR list by area	Training requirements/upgrades	Training records review, OEM training offerings
Production/Operations	ACR list by area	Production commitment	Realistic sales and operational planning
Supply/Warehouse	ACR list by area	Spares for critical assets	Stocking practices based on criticality

By using ACR, asset management stakeholders can systematically arrive at an agreement about which assets are important to the business and why, thereby appropriately applying resources for their care.

Conducting Good ACR Sessions

Nothing takes the place of good, detailed preparation prior to conducting any ACR session. Utilizing a well prepared and organized master equipment list (MEL) or master asset list (MAL) by group and area, consider arranging each ACR session by a discrete list of assets (typically 80 to 100 assets depending on complexity) for a 90-minute duration with facilitation. Choose your SMEs for their particular knowledge of both the equipment and area of the plant or company. Since most companies are usually tight on resource availability, the facilitator should have the ability to manage time expectations, as this is not only courteous, but demonstrates a professional commitment to the EAM process. A word of caution: while it may seem convenient to distribute these lists of assets for scoring independently, the interaction between different SMEs is where the real criticality facts come out. Often, engineering will have a differing view on asset criticality than operations or maintenance, but in any case, getting to a consensus is the real goal.

“ACR defines the relative importance of asset failure consequences to the overall business”

Preparing the Organization for the Results and Meaning of the ACR

When considering the benefits of conducting an ACR, it's important to understand why and what can be expected from this process. Keep in mind that any ACR is not the be-all and end-all of process checks. The outcome of this activity has benefits for other parts of the organization and is really much more than just a “maintenance” tool. Engineering, finance, human resources/training and production/operations all should be aware of the information that will be provided from the rigor of an ACR. For example, knowing which assets are the most critical and where investment strategies should be placed impact more than the maintenance department. Most companies are a collection of various assets that do not always work well together within their designated process. Perhaps newer equipment versions have increased functionalities or vastly improved reliability curves, or items may have just hit the end of useful life and are due for replacement. Whatever the case may be, the Table 1 chart explains the information and possible usefulness of the ACR process to different areas of the company.

Companies may choose different reports or outcome benefits, but it all comes down to this one question: Does your company utilize the ACR process in ways that benefit the total reliability program or is this just one more data set that gets posted to the computerized maintenance management system (CMMS)?

Some ACR Realities

An analysis of asset criticality rankings performed at numerous companies shows several things always seem to pop up. First, data and usage histories are usually never as good as is claimed. Also, different areas of a plant or division utilize the CMMS differently in terms of work order creation, work recording and parts usage. Furthermore, the MEL or MAL, which tells a lot about the background and organization of all the assets, typically has issues with terminology (what is and isn't an asset), units of measure and a lack of hierarchy. This can leave the ranking process with more opinions than fact. Usually, these issues cannot be completely resolved before conducting the ACR, but simply recognizing them as next step activities will add immensely to the value of the entire EAM process. Speaking the same ACR language and terminology throughout the plants or divisions eliminates many interpretive issues as one goes forward.

After the ACR process has been conducted, planning and scheduling activities for maintenance work orders can be guided by the rankings on a priority basis. In other words, the highest ranking criticality among the work orders would be chosen first for execution and then each lower level ranking is performed in turn until all back orders are completed.

When applying criticality rankings to any work scheduling, the analysis reveals that many companies really do not plan and schedule their work in an organized way. Methods, such as supervisor selection, workforce seniority selection, or simply whatever sequence in the stack gets worked on first, second, etc., is how the work gets accomplished. These methods are subjective and do not comply with the rules of reliability or criticality and really leave no room for asset criticality ranking scores.

In addition, parts may not be available or the correct skills personnel may be off work, both of which could have been avoided with a little advanced planning guided by the ACR results.

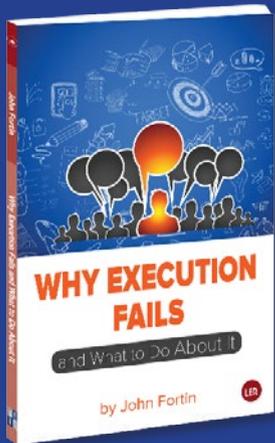
Conclusion

Asset-intensive businesses should embrace the asset criticality ranking process and all the discovery that comes with it. Sorting out terminology and usage data, and understanding the ranking process and the implications for work order execution are but a few of the overall benefits. Removing most areas of subjectivity from capital investments, work order process and the supply chain takes the adventure out of day-to-day maintenance routines and supports the capitalization and administrative goals of effective, reliable asset management.

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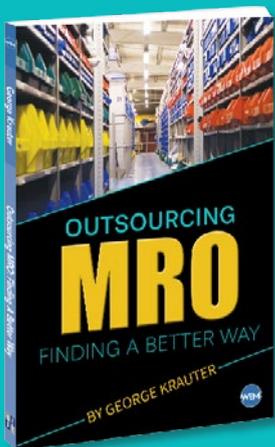
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Having over 50 years in the MRO supply chain, George Krauter shares his expertise and experience through a collection of case studies, vignettes and memories.

ACR Value: An Inside Story

Recently, a major transit company was conducting a full asset criticality ranking (ACR) on its principal facility that supported equipment maintenance. The facility operation was also critical to many other activities and was touted as a premier example of how facilities should operate. Lots of environmentally sound equipment and many precautions were built into the design. It looked quite impressive!

After the ACR was completed, a series of questions were posed to a group of engineers and maintenance people. From the list of eight critical items, they were asked:

What is the maintenance strategy for each item?

- Preventive maintenance (PM)
- Predictive maintenance (PdM), also referred to as condition-based
- Run to failure (RTF)

What is the material/stocking strategy for each critical item?

- Spares on hand with restocking levels identified
- Spares available at local supplier with less than four hours to deliver
- No spares arranged, usual expedited ordering in case of failure

Following their responses, arrangements were made for the company's computerized maintenance management system (CMMS) to conduct a query by critical part number live on a screen where the group was gathered. The point was to see what the system contained. The query showed:

- Six out of eight critical items had no maintenance or PMs identified, so by default, they were deemed run to failure.
- Two of the critical items had some mention of an original equipment manufacturer (OEM) recommendation, but were not complete.
- Only one critical item had maintenance spares on hand, but without any reorder point.
- The remaining items had no spares or ordering process in place.

The moral of this ACR is this: Remember to follow up on any new equipment or facility to ensure all assets, especially critical ones, are thoroughly reviewed and vetted for documentation and PM instructions. And whenever an ACR is conducted on any equipment or facility, remember to review the CMMS for the preventive maintenance instructions and spares strategies.

Don't wait for failure to create its own discovery process.



Ralph D. Tileston, CMRP, is a Principal Reliability Engineer and Project Leader in Charleston, SC. He has over 30 years' experience in various management levels in telecommunications, electrical construction and maintenance support. Included responsibilities were operations sales and service for regional areas of the U.S., material management at the sourcing and distribution levels and training and process development. During his military career in the U.S. Air Force, Ralph worked in cargo and logistics support and air delivery for all branches of the military service.

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