



RISK AND RELIABILITY

RELIABILITY SERVICES

Achieving Asset Management Excellence



Aligning Resources to Corporate Objectives

Asset Management Excellence ensures that an organization's systems, processes and people align with the company's mission and commercial objectives.

Our propriety Asset Management Excellence Approach, designed around the ISO 55000 standard, establishes a roadmap that prioritizes execution based on areas that will have the biggest impact to the business. We are driven by client outcomes and collaborate as partners to achieve asset management objectives across the asset lifecycle.

BENEFITS

- 20% to 30% maintenance and operating cost reduction when a sound reliability strategy is implemented and sustained
- Reduce equipment breakdown, unplanned downtime and "firefighting"
- Align with the ISO 55000 Asset Management Standard
- Reduce overstocking, understocking and expedition of parts
- Establish maintenance and reliability capabilities that support increased digitalization as technology evolves
- Clearly define goals, roles and responsibilities for reliability improvement across the organization
- Reduce contractor management issues and contractor costs
- Establish a culture of continuous improvement for reliability
- Pinpoint chronic bad actors for improvement action

Gap Analysis and Improvement Plan

Use our experts to help formulate your roadmap to excellence

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Gap Analysis and Improvement Plan

ASSET MANAGEMENT ASSESSMENT

How do you ensure that your current platform is ready to support future maintenance and reliability practices while there is an increasing drive towards digitalization? Our proprietary Asset Management Approach simplifies the process by breaking down the elements into smaller, more manageable activities that are grounded in commercial reality and prioritized based on where the greatest gains can be achieved in the shortest time frame. The Asset Management Assessment benchmarks an organization against seven recognized elements:



ABS Group Asset Management Approach

Our thorough approach identifies opportunities for improvement and provides the support needed to justify your improvement projects.



IMPROVEMENT PLAN

The completed assessment provides the knowledge required to generate a customized road map of actions to move your organization towards proactive, optimized and sustainable practices in asset management. These practices align asset management goals with overall company goals, increase equipment availability, reduce inventory holding and purchasing costs and bolster your company's reputation as a supplier of choice.

Reliability Fundamentals

The fundamentals of reliability focus on establishing the foundation upon which the rest of your reliability system is built. We utilize components from Organizational Readiness, Reliability Strategy, CMMS Utilization and Performance Optimization to introduce the concepts of reliability and to empower your organization to reach its reliability goals.

ORGANIZATIONAL READINESS

We partner with clients to establish an organization that is equipped to drive Asset Management Excellence results and define processes which set the foundation for continuous improvement and sustainability. This includes the development of an Asset Management Council, RACI (Responsible, Accountable, Consult, Inform) charts for asset management processes, procedures related to the hierarchy and master asset list development and asset criticality ranking.

HIERARCHY AND MASTER ASSET LIST DEVELOPMENT

The information entered in your hierarchy and master asset list has a profound and long-lasting effect on your maintenance and reliability efforts. Having a clear definition of an asset, and applying it to your hierarchy and master asset list is crucial to improving the efficiency of your operations. Our proven processes help you identify the equipment, build a hierarchy that works for you, and expand and improve as your organization matures.

ASSET CRITICALITY RANKING

Using the master asset list, we apply our customizable tools to objectively determine the business risk each asset represents in a relative ranking process. Our experienced facilitators help guide your subject matter experts through the process to realize quick, accurate and consistent results. Knowing the relative importance of assets allows you to focus on your most critical assets to improve decision-making about resource allocation and prevent functional failures. Additionally, identifying the least important assets may lead to a

reduction or elimination of planned maintenance and spare parts holding for those assets. This optimizes both ends of the spectrum delivering faster results.

CMMS SETUP

Your CMMS is a tool, but it doesn't do everything right out of the box. Many data elements support user-defined data to simplify operations and improve analytic capabilities. Our experts will set up your CMMS to ensure that the data can be used to analyze all aspects of maintenance including cost and reliability. This includes the identification and linking of spare parts to existing maintenance plans, development of equipment-specific failure codes and failure causes for use in reliability analytics.

DEFINE BASIC KPIS AND METRICS

Key Performance Indicators (KPIs) and metrics should support the mission of your organization. Our team will work with you to establish KPIs and metrics for monitoring maintenance activities with calculations and goals. This might include preventive maintenance compliance, preventive maintenance work as a percentage of total hours, corrective maintenance work as a percentage of total hours, and the number of equipment without preventive maintenance.



Advanced Reliability

ASSET STRATEGY OPTIMIZATION

Asset Strategy Optimization (ASO) is the process of developing a logic-based strategy from scratch or revising existing strategies. As a part of this strategy, every maintenance task must be directly linked to a failure mode.

The strategy used to identify the failure modes will be based on the equipment criticality, time in the equipment lifecycle and your organization's risk tolerance. The strategies applied might include; Reliability Centered Maintenance (RCM), Existing Maintenance Task Analysis (MTA), Recognized and Generally Accepted Good Engineering Practice (RAGAGEP), or Existing Customer Requirements (ECR). The outputs of the ASO process are strategies for preventing, identifying, mitigating or accepting the failure modes. Examples of these strategies are fixed time replacement, failure finding, condition-based maintenance, predictive analytics and no planned maintenance.

SPARE PART ANALYSIS

Performing a Spare Part Analysis goes beyond accepting OEM recommendations from their spare parts lists or bill of materials, or making changes to those lists based on experience or cost of the parts. The spare part analysis uses the results from ASO and the corrective actions required to correct a failure (planned corrective maintenance) to identify the parts that are required to maintain your equipment (planners bill of materials). We then look at various factors to determine the criticality of the parts and whether they should be held in stock.

INVENTORY STOCKING

Utilizing your planners bill of materials, we help you apply mathematical calculations to establish reorder points, reorder quantities and safety stock levels for your parts. We also help you establish guidelines and processes around inventory control (receipt, issue, return). To complete the inventory management process, we help you establish your ABC categories for inventory which forms the basis for cycle counting and provides another data point for inventory metrics.

WORK MANAGEMENT

Work management establishes workflows to streamline the processes around work identification, work planning, work scheduling and work execution. Executing these activities help your organization get accurate data into your CMMS while ensuring consistent and efficient work management practices.

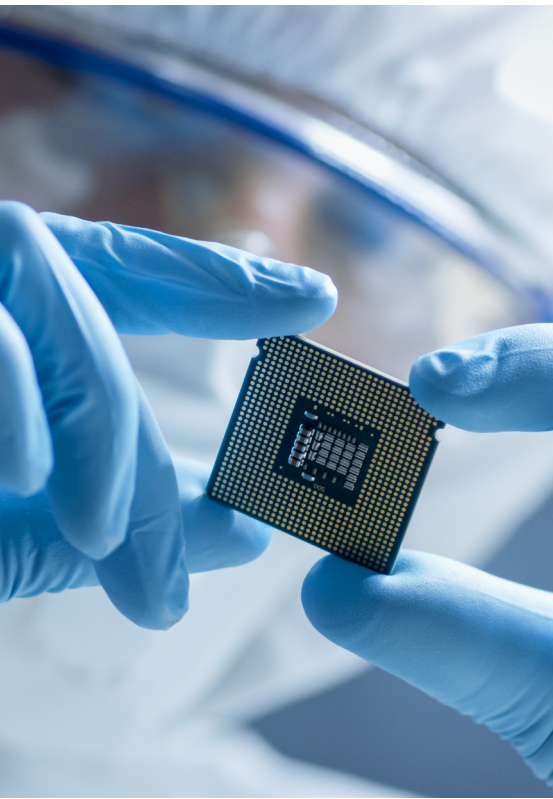
RELIABILITY ANALYTICS

Reliability analytics provide visibility into the health of your reliability program and identifies areas for improvement through root cause analysis. Our team will uncover existing data points and optimize your CMMS to support your efforts. We create dashboard visualizations that show your overall reliability health status and allow you to drill down into the data to reveal bad actors.

DEFINE ADVANCED KPIS AND METRICS

Advanced KPIs and metrics focus on efficiency and quality of maintenance processes and practices with more specificity than those established in the Foundational Maintenance phase. These advanced metrics help to identify opportunities to fine tune your maintenance activities.





Implementation Services

EAMS EVALUATION

Whether you already have a mature system or are planning to implement an Enterprise Asset Management System (EAMS), our team of experts will perform an evaluation of the current system utilization, including features and capabilities, data elements, reports and interfaces. Alternatively, we compare and contrast various systems to support the selection process. We provide a detailed customized report based on a specific business need with findings and recommendations.

PROCESS ENGINEERING

Coupling business process with system usage is a fundamental step in a successful system rollout. Our industry experts work with clients to define business workflows and procedures to optimize operations. Our clients have access to our industry best practices knowledge base which provides asset, work and inventory management processes, as well as MRO procurement management.

SYSTEM DEPLOYMENT AND UPGRADES

Avoid system performance and scaling issues by working with our team to size and deploy your EAMS in a standalone or a clustered environment, on premises or in the cloud. Stay current with features, remain in compliance and maintain security by performing periodic upgrades.

SYSTEM CONFIGURATION

Position yourself for data-driven decision-making with a properly configured system which meets business requirements, is based on asset management fundamentals and is built to promote advanced reliability.

DATA MIGRATION

Get the most out of your EAMS with a solid data foundation. Do not leave your good data behind and do not feed incomplete, unclean, unnormalized and inaccurate data into your EAMS. Using both proprietary and EAMS embedded tools, our data specialists work closely with you to ensure your data is ready and available from day one.

SYSTEM INTEGRATION

Connect your EAMS with other 3rd party systems, smart equipment sensors, data historians, process control systems, augmented reality devices and AI to attain swift return on investment through increased efficiency, automated processes, reporting and data analytics.

TRAINING

Engage with our team to realize value through our comprehensive EAMS and process training. Our training courses focus on either Maximo or Infor EAM and include topics such as maintenance, inventory, purchasing and calibration management, system administration, workflow development and report creation. In addition, we provide CMMS/EAM system agnostic training on utilization and best practices.

SUPPORT

Subscribe to our multi-tier support offerings to enhance or augment your team. A variety of services are available with different options based on the amount of assistance needed to support your daily activities. Support topics include functional support, data updates, integration support, architectural support, workflow assistance, technical troubleshooting, issue resolution, and report support.

Using both proprietary and EAMS embedded tools, our data specialists work closely with you to ensure your data is ready and available from day one.



Inventory Management

INVENTORY OPTIMIZATION

In the world of asset management, we hold spare parts for two reasons: (1) to proactively maintain equipment and avoid a breakdown and (2) to reactively repair equipment after a breakdown.

This means that the best way to optimize your inventory is by thoroughly understanding how your equipment can fail and developing and implementing strategies to prevent or mitigate those failures. These strategies lead to the development of preventive and corrective maintenance plans with the bill of materials required to carry out the work. These then form the basis of your inventory. We can help you right-size your inventory through maintenance optimization.

WAREHOUSE SETUP

Our experts review your current setup and operational requirements to help you identify the optimal configuration for your warehousing needs. Whether it is a consolidated, distributed or hybrid setup, we can help you organize your storage for maximum efficiency. To further increase your warehouse efficiency, we can help implement barcoding or RFID (radio-frequency identification) and mobile solutions to simplify your inventory receiving, issuing and counting.

DATA-DRIVEN STOCKING LEVELS

Inventory carrying costs can be up to 30% of your inventory value on an annual basis. Using your usage history, we will utilize algorithms to determine your optimal stocking levels. Having control over your reorder points, reorder quantities and safety stock levels helps to ensure you have the parts you need on hand when you need them while keeping your stock levels to a minimum.

INVENTORY STOCKING

Utilizing your planners bill of materials, we help you apply mathematical calculations to establish reorder points, reorder quantities and safety stock levels for your parts. We also help you establish guidelines and processes around inventory control (receipt, issue,

return). To complete the inventory management process, we help you establish your ABC categories for inventory which form the basis of cycle counting and provide another data point for inventory metrics. We can also help establish a basis for vendor-managed and consignment inventory decisions.

DATA CLEANSING AND STANDARDIZATION

Lack of quality part data is extremely costly. From repeat work by buyers to overstocking and part shortages, having incomplete part information is hurting your business. Our inventory specialists help you identify and populate the needed information to help your operation run efficiently.

Inventory carrying costs can be up to 30% of your inventory value on an annual basis.

CAPITAL / INSURANCE SPARES

Why do you purchase capital spare equipment or parts? Generally, it is based on two subjective measures. The first is that it is cheaper to buy the spare during the construction phase and the second is the concern that the failure will create a lot of downtime. Both are valid concerns, but how do you change them from subjective measures to something objective? We can help! Using a variety of data, we apply a mathematical formula to aid in the determination of whether the capital/insurance spare should be purchased.

KPIS AND METRICS

Properly managing your inventory requires knowledge about current state and past performance. Our team can help you implement Inventory KPIs and metrics that will help keep your warehouse running on an even keel.

IIoT and Digitalization

GOAL

Within the maintenance and reliability framework, the drive for digitalization comes from the desire to reduce costs, increase reliability and enable better decision making. Like so many trending initiatives, rushing into digitalization without understanding how it will support business objectives can end up costing a lot of money for little to no return. Our goal is to help provide guidance and demonstrate when, why and how the use of IIoT and digitalization will help further your organizational goals.

IDENTIFICATION

What needs digitalization in your organization? Establishing the business case must be the beginning of every digitalization conversation. What do I need to digitalize? How much is it going to cost to implement? What gains can I reasonably expect to have? How long will it take to pay back my investment? Our processes help you answer these questions to provide the best outcome for you.

COST-EFFECTIVENESS

While many consultants espouse the wonders of digitalization (and truly it is wonderful!), we understand that it may not always be the optimal solution for your application. Our advanced reliability processes help identify the failure modes of your equipment as well as the consequences of failure. These insights help determine the methods by which these failures can be prevented or mitigated. It is at this point that we look at the cost-effectiveness of the various strategies and pick the best solution. If the consequences of failure are low, digitalization is probably not the right approach! Start optimizing your digital solutions.

CYBERSECURITY

Cyber attacks on industrial control systems are on the rise. Implementing IIoT and digital strategies without understanding and mitigating your exposure to operational technology (OT) cyber attacks can lead to disastrous consequences. Our cybersecurity experts specialize in cyber program set-up and

implementation, including penetration testing, hardening and monitoring of operational technology systems to help keep you protected.

HIERARCHIES

With a decision to go digital comes a requirement to manage your assets at a more granular level. Our reliability experts can perform equipment walkdowns, drawing reviews and interface with our predictive analytics experts to produce an equipment hierarchy that can manage your digital maintenance needs.

IMPLEMENTATION

Once digitalization has been selected as the method of choice to prevent your equipment failure, our team can help make it a reality. We partner with highly competent integration specialists to install the required sensors and process the data to make it available to your analysis systems. We also have teams who develop machine learning algorithms to identify developing failure modes and EAMS specialists who tie everything together to automatically generate work orders based on output from the algorithms.



Newbuild / Greenfield Projects

CHALLENGE

A new project brings many new challenges and questions. How do I organize and prioritize my assets? Which spare parts do I need? How can I optimize maintenance from the start? From hierarchies and master asset lists to maintenance and spare parts requirements, our experts are available to start your operations on the right foot.

HIERARCHY AND MASTER ASSET LIST

The information entered in your hierarchy and master asset list has a profound and long-lasting effect on your maintenance and reliability efforts. Having a clear definition of every piece of equipment in a master asset list is crucial to improving the efficiency of your operation. Our proven processes help you identify the equipment and build your hierarchy to work for you today and allow for expansion and improvement as your organization matures.

ASSET CRITICALITY RANKING

Using the master asset list, we use our customizable tools to objectively determine the business risk each asset represents in a relative ranking process. Our experienced facilitators help guide your subject matter experts through the process to realize quick, accurate and consistent results. Knowing the relative importance of assets allows you to focus on your most critical assets to improve decision-making about resource allocation and prevent functional failures. Additionally, identifying the least important assets may lead to a reduction or elimination of planned maintenance for those assets. This optimizes both ends of the spectrum delivering faster results.

ASSET STRATEGY OPTIMIZATION

Asset Strategy Optimization (ASO) is the process of developing a logic-based strategy from scratch or revising existing strategies. As a part of this strategy, every maintenance task must be directly linked to a failure mode, which in turn is linked to a failure effect found in the Asset Criticality Ranking (ACR). The strategy used to identify the failure modes will be based on the equipment criticality, time in the equipment lifecycle and your organization's risk tolerance. The strategies applied might include: Reliability Centered Maintenance (RCM), Existing

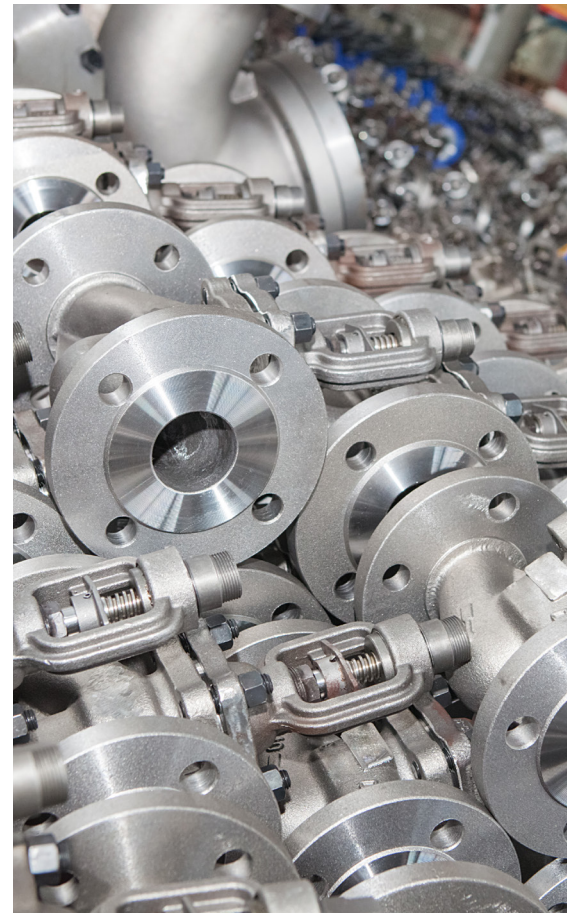


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SPARE PART ANALYSIS AND INVENTORY MANAGEMENT

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About ABS Group

ABS Group of Companies, Inc. (www.abs-group.com), through its operating subsidiaries, provides data-driven risk and reliability solutions and technical services that help clients confirm the safety, integrity, quality and environmental efficiency of critical assets and operations. Headquartered in Spring, Texas, ABS Group operates with more than 1,000 professionals in over 20 countries serving the marine and offshore, oil, gas and chemical, government and industrial sectors. ABS Group is a subsidiary of ABS (www.eagle.org), one of the world's leading marine and offshore classification societies.



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