From Edge to Enterprise - AspenTech and Emerson's Comprehensive Reliability Solution

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Reliability has long been a critical aspect of an industrial organization's operations, affecting production throughput, product quality, on-time delivery, customer satisfaction, and overall business performance. In attempting to manage plant reliability, many companies resort to using a blend of different practices, systems, and technologies that are often siloed or ineffective when evaluated at the system level. As pressure increases for companies to invest in digital transformations and implement industry 4.0 practices to keep up with competitors and improve key performance indicators, a need has arisen for an integrated solution that combines traditional reliability solutions like vibration analysis, with prescriptive maintenance solutions that use advanced pattern recognition to detect and diagnose failures and anomalies early. AspenTech and Emerson have partnered to create the first fully integrated, native reliability solution for the manufacturing, production, and process industries. The solution incorporates the sensor instrumentation and wireless monitoring of Emerson's AMS platform with AspenTech's AI & machine learning advanced analytics solution. The result is a culmination of the best parts of two award-winning solutions, bundled and fully integrated together. This new integration offers multiple layers of protection across the entire plant asset lifecycle.

The field of reliability management is witnessing several industry trends and challenges that impact the development and deployment of comprehensive reliability solutions. Understanding these trends and challenges is crucial for organizations aiming to build effective reliability management systems.

Industry Trends

- Increasing Complexity of Products: Modern products are becoming increasingly complex, incorporating advanced technologies and more interconnected components. Modern facilities rely on an infrastructure of sensors, edge computing devices, centralized control systems, and specialized software to operate efficiently. This complexity poses challenges in ensuring reliability across the entire system. Reliability solutions must adapt to manage increasingly complex system architectures, diverse interfaces, and interdependencies among various components.
- Growing Emphasis on IoT and Connected Devices: The proliferation of Internet of Things (IoT) devices and connected technologies has expanded the scope of reliability management. Reliability solutions need to incorporate real-time monitoring and data analytics capabilities to collect and analyze vast amounts of data generated by interconnected devices. This trend also highlights the importance of cybersecurity and data privacy in reliability management.
- Shift towards Proactive and Predictive Maintenance: Traditional reactive maintenance approaches are being replaced by proactive and predictive maintenance strategies. Organizations are leveraging advanced analytics, machine learning, and artificial intelligence to predict and prevent reliability issues before they occur. Building comprehensive reliability solutions that enable proactive maintenance and predictive analytics is a growing trend in the industry.

Challenges

- **Data Management and Integration:** Reliability solutions rely heavily on data from various sources, such as product performance, maintenance records, and customer feedback. Collecting, managing, and integrating these diverse data streams pose significant challenges. Organizations need robust data management and integration capabilities to ensure data accuracy, reliability, and accessibility throughout the reliability solution platform.
- **Legacy Systems and Interoperability (point solutions):** Many organizations face challenges in integrating reliability solutions with existing legacy systems. Legacy systems often lack compatibility and interoperability, hindering seamless data exchange and integration. Overcoming these challenges requires careful planning, system integration expertise, and possibly migrating to more modern and compatible platforms.
- **Skill Gaps and Workforce Training:** Building and deploying comprehensive reliability solutions require a skilled workforce with expertise in data analytics, predictive modeling, and reliability engineering. However, there is a shortage of professionals with these specialized skills. Organizations need to invest in workforce training and development programs to bridge these skill gaps and ensure effective implementation of reliability solutions.
- **Cost and Return on Investment:** Developing and deploying comprehensive reliability solutions can involve substantial upfront costs. Organizations need to assess the return on investment (ROI) and demonstrate the value and benefits of such solutions to stakeholders. Balancing the cost of implementation with the potential cost savings from improved reliability and reduced downtime is a significant challenge.

Comprehensive Reliability Solution

With an integrated reliability solution developed specifically for heavy industrial manufacturing and process industries, business leaders can now reap the benefits of a transformative new solution while directly addressing these challenges. AspenTech and Emerson's comprehensive reliability solution utilizes the award-winning technology of both Emerson's AMS software and AspenTech's Mtell software. The native integration between these two software platforms creates the most powerful and transformative industry reliability solution on the market today.

Combining AspenTech's Mtell software with Emerson's AMS platform can offer several benefits and differentiators in the field of industrial asset management and predictive maintenance. These two platforms, when integrated, provide a comprehensive solution for optimizing the performance and reliability of industrial assets. Some of the key benefits and differentiators include:

Enhanced Predictive Maintenance Meets Comprehensive Asset Management

- AspenTech's Mtell software solution specializes in predictive and prescriptive maintenance using advanced pattern recognition and machine learning. It can analyze historical data, real-time sensor data, and other asset-related information to predict equipment failures and degradation. Mtell ingests both process and equipment data to detect anomalies and potential failures. Combining this capability with Emerson's AMS platform allows for richer data analysis with more accurate predictions of asset health and performance.

Aspen Mtell Agent Types.

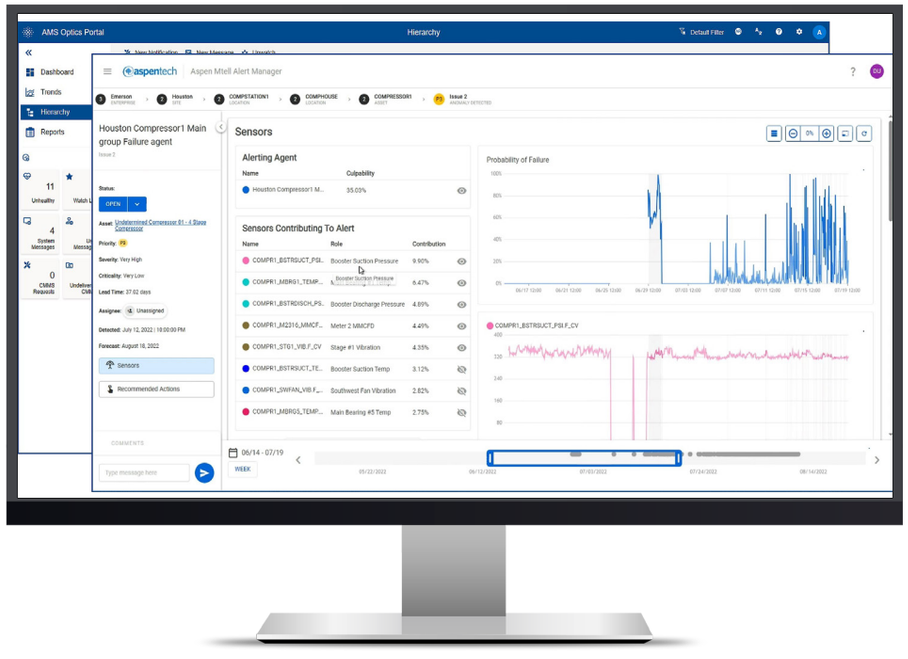
- Emerson's AMS platform is known for its comprehensive asset management capabilities. This software specializes in device management such as sensor calibration and documentation, as well as advanced vibration analysis techniques that use spectral waveform data and time series data to analyze equipment for failures and other defects. When integrated with Mtell, it can provide a holistic view of an organization's asset health, enabling better decision-making regarding maintenance, repair, and replacement.

Proven Industry Expertise

- Both AspenTech and Emerson are established leaders in their respective fields. AspenTech is a global leader in process optimization and predictive maintenance solutions, while Emerson is a global leader in industrial automation and asset management. This combined reliability solution benefits from the industry-leading expertise and reputation of these two companies.

Data Integration

- The integration of these platforms enables seamless data exchange between the two systems. Data collected by Emerson's AMS platform, such as equipment health and vibration sensor readings, can be fed into Mtell for advanced analytics and predictive maintenance models. This integration streamlines data workflows and ensures that insights from one platform can inform actions in the other.



Aspen Mtell Data Collector for AMS Optics allows users to launch Mtell in context from their AMS Optics dashboard.

Improved Asset Reliability

- By combining the predictive maintenance capabilities of Mtell with the asset management features of Emerson’s AMS platform, organizations can proactively address asset reliability issues. This leads to reduced downtime, increased equipment lifespan, and improved overall operational efficiency.

Cost Reduction

- Predictive maintenance and comprehensive asset management can help organizations optimize maintenance schedules and reduce unnecessary maintenance activities and unplanned downtime while increasing production throughput. This can result in significant cost savings by avoiding unnecessary repairs and extending the lifespan of critical assets. Some industry examples include reduced maintenance costs of 10% – 20% across the enterprise as well as increased production throughput of 2% or greater.

Scalability and Flexibility

- The combined solution can be scaled to meet the specific needs of different industries and organizations. Whether it's managing a few critical assets, an entire industrial plant, multiple plants, or a global footprint of plants at an enterprise level, this integrated platform can rapidly scale in size and complexity and adapt to different scenarios and asset types.

User-Friendly Interface

- Emerson’s AMS Optics platform comes with a user-friendly interface that is well-suited for operators, maintenance personnel, and management. The integration of Mtell can enhance this interface with predictive insights, making it easier for users to understand asset health and take appropriate actions.

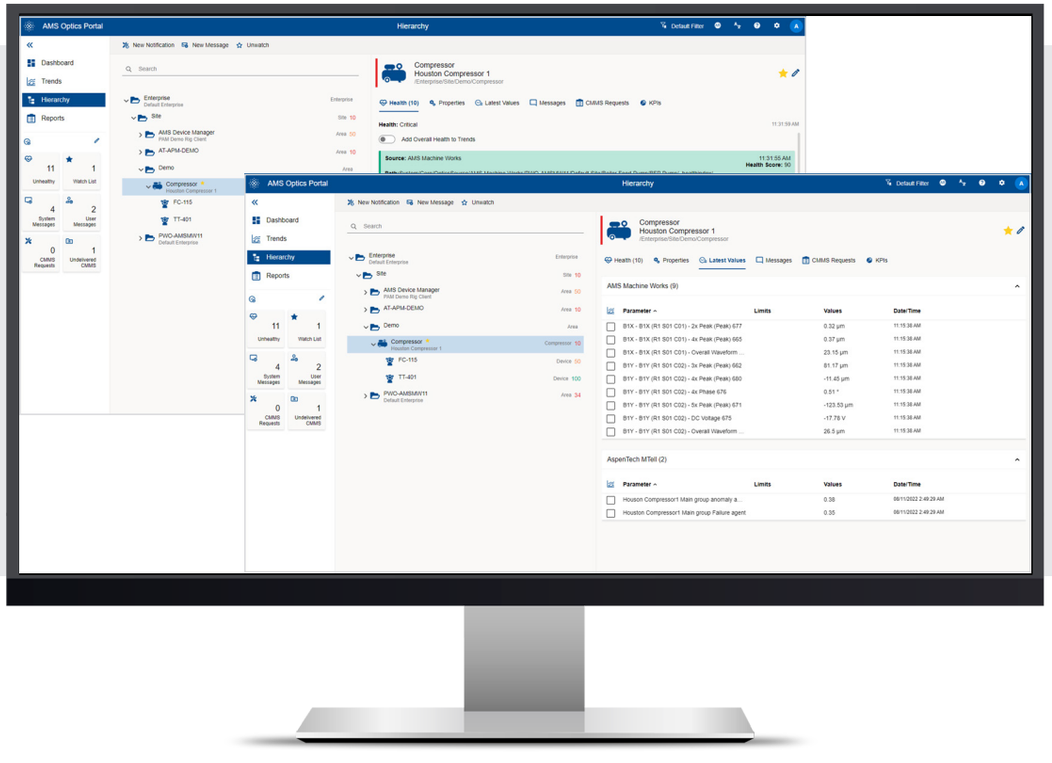
Advanced Analytics

- Mtell's machine learning and analytics capabilities can provide deeper insights into asset performance, allowing organizations to fine-tune maintenance strategies and make data-driven decisions. Emerson's AMS platform strengthens and enhances these capabilities through robust maintenance and vibration data acquisition.

Improved Safety

- Most safety incidents occur during start-ups, shut-downs, and abnormal operating conditions. Employing a smart predictive maintenance solution allows for improved risk mitigation by reducing the frequency of these events, and providing deeper analytics when they do happen to drive better decision-making. By providing advanced actionable insights into equipment and processes during these events, the guesswork and likelihood of human error is reduced. This helps to drive a stronger proactive safety work culture, in addition to the cost reductions typically associated with predictive maintenance solutions.

Combining AspenTech’s Mtell software with Emerson’s AMS software offers a powerful solution for industrial asset management and predictive maintenance. The integration of advanced analytics and comprehensive asset management capabilities can help organizations maximize asset reliability, reduce operational costs, and make more informed decisions regarding their critical assets.



Focus on Critical Assets with AMS Optics.

Moving toward a new technology platform for reliability requires careful planning, strategic implementation, and effective change management. Both Emerson and AspenTech are fully committed to helping customers achieve these digital transformations to unlock the benefits this platform provides. Below are some best practices that organizations can follow to successfully transition to this new reliability solution.

1. **Form a Project Team:** Establish a cross-functional project team comprising members from relevant departments such as maintenance, reliability engineering, IT, operations, and management. Assign a project champion to oversee the software transition.
2. **Define Objectives and Success Criteria:** Clearly articulate the objectives and goals of adopting the new reliability technology platform. Identify the specific pain points and challenges you aim to address through this implementation. Identify success criteria that would make your organizational move to the new technology platform a success.
3. **Conduct a Needs Assessment Workshop:** Emerson and AspenTech will work alongside your team to evaluate your current reliability processes and technology stack and identify gaps and areas that need improvement. This assessment will guide your asset selection and equipment coverage based on value-driven metrics.
4. **Budget and Resource Allocation:** Allocate a budget for the transition, including costs for the new technology, implementation, training, and potential consulting services. Ensure you have the necessary resources and personnel to carry out the transition effectively.
5. **Align on an Implementation Plan:** AspenTech and Emerson together have defined implementation plans that are ready to go for your industry and application. From smaller scale site level deployments up to full site and enterprise level deployments, Emerson and AspenTech have you covered. These detailed implementation plans outline the steps, timeline, responsibilities, and milestones for the transition, as well as cover data migration, training, testing, and communication strategies.
6. **Data Preparation and Migration:** Prepare your existing reliability data for migration to the new platform. Ensure data accuracy and integrity during the migration process. Data from various sources, such as spreadsheets or legacy systems, might need to be transformed and standardized. During the project phase, this step is typically handled by the service provider.
7. **Training Strategy:** Develop a training strategy to educate employees on how to use the new platform effectively. AspenTech and Emerson offer a host of workshops, webinars, and training materials to ensure a smooth transition, as well as continuous sustainment support for their reliability solutions.
8. **Communication Plan:** Create a communication plan to inform all relevant stakeholders about the upcoming changes. Communicate the benefits of the new platform, the timeline, and how it aligns with the organization’s goals.

9. **Testing and Quality Assurance:** Rigorously test the new reliability technology solution before full deployment. Ensure that all functionalities work as intended and that data integration is seamless. Provide feedback to the service provider so any potential issues can be addressed immediately.
10. **Rollout and Support:** Gradually roll out the new solution to the broader user base. Provide dedicated support during the transition period to address any issues or questions that arise. For multi-site users, it is typical to pilot the solution at one site, and then gradually roll out the solution to other sites.
11. **Feedback Collection:** Encourage users to provide feedback on their experiences with the new solution. AspenTech and Emerson will use this feedback to make further improvements and adjustments to their software and include these improvements in future releases.
12. **Monitor and Evaluate:** Continuously monitor the performance of the new solution after its implementation. Measure its impact on reliability metrics and operational efficiency.
13. **Documentation:** Document the processes, workflows, and procedures related to the new platform. This documentation will serve as a valuable resource for employees and future onboarding.

By following these immediate steps, organizations can initiate a successful transition to a new reliability technology platform, setting the stage for improved reliability management, asset availability, and operational efficiency.

Conclusion

The industry sector has long been the backbone of economies, providing essential materials and infrastructure for global development. However, this sector is not without its operational challenges, which can significantly impact productivity, safety, and overall performance. As the process industries continue to grapple with issues such as equipment breakdowns, maintenance inefficiencies, and safety concerns, the need for transformative solutions has become increasingly evident.

Traditional approaches to reliability management in heavy industries often involve fragmented systems, manual data collection, and reactive maintenance practices. These practices are no longer sufficient to meet the demands of modern industrial operations. Fortunately, a promising solution lies in transitioning to an integrated reliability solution technology platform.

Common Operational Challenges:

1. **Downtime and Production Loss:** Frequent equipment breakdowns and unplanned downtime can result in substantial production losses, impacting revenue and competitiveness.
2. **Inefficient Maintenance Practices:** Reactive maintenance approaches can lead to inefficient resource allocation, higher costs, and decreased equipment lifespan.
3. **Data Silos:** Disparate systems and data sources hinder effective decision-making and holistic reliability management.
4. **Lack of Predictive Capabilities:** The inability to predict equipment failures in advance hampers the implementation of proactive maintenance strategies.
5. **Safety Concerns:** Poorly maintained equipment can lead to safety hazards for workers, potentially causing accidents and regulatory compliance issues.

The Solution: Transition to Integrated Reliability Solution Technology Platform

To address these challenges, the process industries are increasingly turning towards integrated reliability solution technology platforms. These platforms offer a comprehensive and unified approach to reliability management, providing a range of benefits that directly target the sector's operational hurdles:

1. **Holistic Approach:** An integrated platform connects various aspects of reliability management, from data collection and analysis to maintenance planning and compliance monitoring. This holistic view facilitates better decision-making and process optimization.
2. **Predictive Analytics:** Leveraging advanced analytics and predictive algorithms, the platform enables industries to predict equipment failures before they occur with greater lead times than competitor solutions. This empowers proactive maintenance planning, reducing downtime and extending asset life.
3. **Efficient Resource Allocation:** With real-time insights and data-driven recommendations, organizations can allocate resources more efficiently, optimizing maintenance schedules and reducing unnecessary costs.
4. **Enhanced Safety:** By ensuring timely maintenance and identifying potential safety risks, the platform contributes to a safer working environment, reducing accidents and minimizing regulatory compliance issues.
5. **Data Integration:** Integrated platforms break down data silos, allowing seamless data exchange between departments. This fosters collaboration, improves accuracy, and enhances overall data quality.
6. **Native Connectivity:** Having two industry leaders in process software and automation team up to create the first end-to-end reliability solution is powerful enough on its own, but having the two solutions natively integrated together eliminates many headaches. This alleviates the struggle of separate systems updating and then not communicating with each other, as well as obtaining support for these issues. Through natively connecting these two systems to form one integrated reliability solution, customers now have one solution, with one connection, and one primary support source.

The transition to an integrated reliability solution platform is not merely a technological upgrade but a strategic investment in the future of organizations. By embracing this solution, industries can overcome operational challenges, streamline maintenance practices, and position themselves for sustained growth and competitiveness in an evolving global landscape. The promise of reduced downtime, increased safety, and optimized processes makes this transition a transformative step toward a more efficient, reliable, and prosperous future for heavy industries.

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