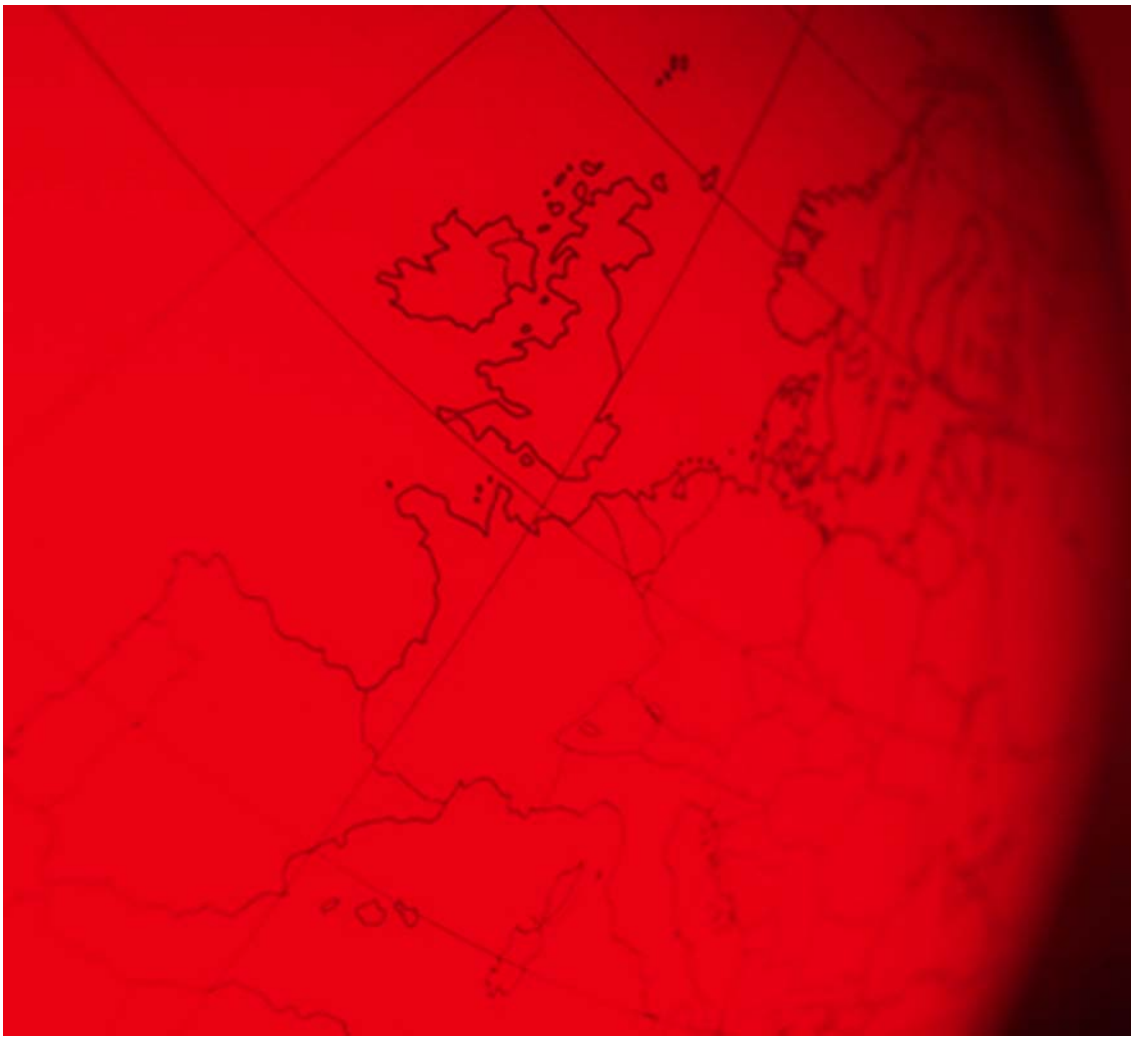
NUCLEUS RESEARCH

May 2010

Document **J99**

GUIDEBOOK
SIEMENS PLM SOFTWARE SOLUTIONS FOR AEROSPACE SERVICE AND SUSTAINMENT



Corporate Headquarters
Nucleus Research Inc.
100 State Street
Boston, MA 02109
Phone: +1 617.720.2000

Nucleus Research Inc.
NucleusResearch.com

TOPICS
Enterprise Applications

THE BOTTOM LINE

Siemens supports solutions for service and sustainment in the aerospace and defense industries that enable companies to reduce service costs and time cycles while increasing profitability across the service life of products.

Siemens PLM Software solutions for the aerospace and defense industries include the capabilities to manage the product structure of complex aerospace systems across their life cycle including serialized part tracking; configuration management; change management; International Traffic in Arms Regulations (ITAR) compliance; and maintenance, repair, and overhaul (MRO).

Siemens positions its software and collaborative environment and its support for ITAR-compliant processes and other industry initiatives as a solution for organizations that need to build a unified architecture. This architecture reduces the need to build and support integration between disparate systems and supports the incorporation of systems engineering data across the service life cycle in a seamless, ITAR-compliance environment.

Siemens PLM Software MRO capabilities include support for asset management, service knowledge management, configuration management, change managements, maintenance planning and execution, material management, reporting and analytics, logistics support analysis, records management, compliance management integration, content management integration, and support for industry standards including PLCS ISO 10303-239, Mil-Std 1388, and S1000D.

THE SITUATION

Aerospace manufacturers have complex products with long life spans that must be maintained and repaired over a long period of time. As the industry has matured, manufacturers have gone beyond simply supplying records for logistics support analysis to compete for maintenance contracts themselves. Whether an original equipment manufacturer is competing for the service life cycle management business or providing product data to an asset owner or service organizations, all must share information to reduce costs, improve service quality, and ultimately provide feedback for future product management.

Since the Department of Defense directive advocating performance-based logistics (PBL) in 2001, manufacturers have also had to balance the challenges of PBL with return on investment and profitability. In a PBL model, suppliers are paid for system performance and capability over time, and the supplier often has to guarantee performance at a lesser cost than other alternatives. Thus, manufacturers must reduce the costs of systems to manage while maintaining a level of predictability about complex system performance from delivery to 10 years out to end of life.

Siemens PLM Software solutions for service and sustainment enable manufacturers to profitably manage service and sustainment across the product life cycle. The

© 2010 Nucleus Research, Inc. Reproduction in whole or part without written permission is prohibited.
Nucleus Research is the leading provider of bottom line-focused technology research and advice.
NucleusResearch.com

Siemens solution provides a single secure source of information to support the full product life cycle. Service data management captures and provides access to configuration and service information for assets including their in-service state and history. Key returns organizations achieve from the Siemens solution include:

- Reduced service cycle time
- Reduced service cost
- Improved equipment reliability, availability, and predictability
- Reduced total cost of ownership
- Increased profits
- Improved ability to meet or exceed PBL requirements

The Guidebook explores best practices, fine-tuning tips, and missteps to avoid for companies to maximize returns from their investment in a Siemens solution for service and sustainment in the aerospace and defense industries.

BEST PRACTICES

Aerospace and defense manufacturers deploying Siemens solutions maximize return on their investment by leveraging the technology's ability to support complex product lifecycles and service and support programs.

Leverage an integrated environment

Performance-based logistics and service level agreements are driving both manufacturers and maintenance managers to jointly manage technical information about systems across an extended product life cycle. Support for end-to-end collaboration helps reduce ongoing maintenance costs, increase equipment availability, and drive competitive new product management.

From serialized part tracking to change management, and during maintenance, repair, and overhaul (MRO) processes, manufacturers can use Siemens solutions to provide an appropriate level of information to various partners, asset owners, and service providers. An integrated digital environment (IDE) provides users with access to data at any phase in the product life cycle and reduces the number of applications users need to learn to manage PBL requirements.

Use MRO to optimize use of resources

Siemens PLM Software's "configuration-driven MRO" approach streamlines collaboration and information sharing between the engineering, manufacturing, logistics, and maintenance communities to drive more efficient services. Siemens solutions establish a single, secure source of service and process knowledge that can support the full product life cycle for organizations that must cover all of it, or provide access to needed information for those managing the service portion of the life cycle. This integrated end-to-end view can improve service operations by providing a single, commonly accessed and referenced definition of asset configuration and status.

Streamlining MRO within the PLM environment, Siemens PLM Software solutions can deliver leaner operations and improved asset performance while closing the loop among product engineering, manufacturing, and services and maintenance to improve overall product life cycle management. When data from support is

© 2010 Nucleus Research, Inc. Reproduction in whole or part without written permission is prohibited.
Nucleus Research is the leading provider of bottom line-focused technology research and advice.
NucleusResearch.com

included in the IDE, manufacturers can deliver more innovative systems and position themselves to plan and deliver MRO services more effectively.

Encourage and train for collaboration

Distributed teams must be coordinated so they can consistently deliver, and must be able to allocate and manage resources to meet business goals. Although a technology platform can support those needs, it can only do so if users both understand how to use the platform and are motivated to use it because of the perceived benefits.

Manufacturers deploying Siemens solutions should expect to invest in initial and ongoing training for both internal and external users to ensure effective adoption and feedback on product performance and maintenance requirements and processes.

Particularly in a global environment where mature knowledgeable workers are being asked to share their experience and knowledge, adoption of a collaborative environment can be a challenge. Additional training efforts that go beyond functionality to show users the benefits of adoption to their personal work goals and positions, identify and promote subject matter experts, and market team and individual successes can help drive broader adoption across the supply chain.

FINE-TUNING TIPS

As aerospace and defense manufacturers seek to further reduce costs, reduce errors, and accelerate time to market across the global supply chain, the most successful will continue to evolve their PLM sophistication to drive greater benefits. Key areas where fine tuning can deliver incremental returns include extending PLM workflows, leveraging PLM to further integrate global partners and suppliers, and looking further out into the product life cycle to evaluate opportunities to increase sustainability and reduce service and support costs.

Extend PLM workflows

Once an initial IDE is deployed, organizations can achieve greater returns from their investment by leveraging Siemens solutions' workflow capabilities to automate and streamline additional product development, testing, delivery, manufacturing, and service and support processes. Greater automation will accelerate processes but also provide valuable data from across the product life cycle that can be leveraged for new product and services innovations.

Leverage configuration-driven MRO and industry-specific components

As PLM has evolved and vendors like Siemens PLM Software have made investments in particular vertical solutions, aerospace and defense contractors can reap the benefits by using built-in support for standards and best practices — and focus their investment efforts on further competitive differentiation. Service life cycle management and configuration-driven MRO provide a single definition of assets, configurations, and status across the entire product life cycle and can streamline communication between engineering, manufacturing, logistics, and maintenance providers.

© 2010 Nucleus Research, Inc. Reproduction in whole or part without written permission is prohibited.
Nucleus Research is the leading provider of bottom line-focused technology research and advice.
NucleusResearch.com

Drive adoption to partners across the lifecycle

In the aerospace and defense industry, OEMs are choosing to become more integrators than manufacturers. The more they can streamline handoffs, the more cost effective and competitive they can be. Using Siemens PLM software to support handoffs and a common version of the truth can streamline collaboration with partners and suppliers.

Investigate opportunities for information reuse

Moving forward, the most successful manufacturers will optimize not just development and delivery of products and systems but the means to maintain and support them. Feeding inputs from maintenance and support partners back into the design process can help further improve the sustainability of new products delivered to the market and reduce ongoing service and support costs. Additionally, manufacturers can take advantage of a unified PLM solution strategy to increase data reuse and reduce redundancy.

MISSTEPS TO AVOID

A complex aerospace and defense program will require both strategic planning and tactical common sense. Aerospace manufacturers moving to an end-to-end integrated PLM approach should be aware of the following missteps to avoid to maximize returns from their PLM initiatives.

Don't choose an application without thinking of the whole product lifecycle

Manufacturers are increasingly looking across the product lifecycle — from conception to manufacture to retirement and disassembly — to maximize returns from their products. An integrated digital environment such as the one Siemens provides can support common data across the entire product life cycle.

As part of its initiative to adopt private sector-based practices for aerospace and defense supply chain processes, the US Department of Defense has identified the use of performance-based logistics as a strategic goal. A solution that supports the entire product life cycle can help aerospace and defense executives to improve overall program management capabilities for contracts, products, and services, more effectively negotiate profitable PBL contracts, and improve product reliability and maintainability.

Don't make assumptions about industry issues or compliance

Aerospace manufacturers must comply with a number of different regulatory bodies, standards, and specifications. As those standards evolve, manufacturers need rigorous process controls and requirements management procedures through the life cycle to ensure that no action or change will undermine the integrity, security, or performance of systems.

The risk of non-compliance can be high; however, manufacturers can reduce opportunities for risk by adoption a solution that supports industry standards and best practices. The Siemens solution for IDE and compliance management help to automate basic compliance-related processes across the product life cycle.

© 2010 Nucleus Research, Inc. Reproduction in whole or part without written permission is prohibited.
Nucleus Research is the leading provider of bottom line-focused technology research and advice.
NucleusResearch.com

Don't assume you'll be finished

Continuous innovation and product quality are keys to remaining competitive in the aerospace and defense industry; thus, to be successful companies must use the knowledge from existing PLM efforts to drive ongoing process improvements and identify new means to make service and sustainment more profitable.

A solution that supports both the storage of data and related content can provide the reference library to leverage for future projects; collaboration and communications capabilities can be extended across the product life cycle to service providers and partners to deliver greater efficiencies. The more it is used, the more the solution becomes the single source of information, driving greater innovation and research and development opportunities.

CONCLUSION

In the aerospace and defense industries, manufacturers, maintenance suppliers, and asset owners must minimize MRO costs while supporting service team productivity and system availability. Siemens solutions for service and sustainment enable a centralized, secure source of information for use across the product life cycle, supporting an integrated digital environment (IDE) strategy. A seamless collaborative environment can reduce support costs, accelerate employee training time, increase data reuse, and reduce the skills and resources needed to meet performance-based logistics requirements.

Organizations with limited collaboration or siloed application across the service supply chain are likely to achieve the greatest initial returns from an investment in solutions from Siemens PLM Software. Configuration-driven MRO puts the asset at the center of MRO functions, enabling shared insights between logistics, maintenance, and engineering, to improve the efficiency and predictability of service transactions while managing their costs.

© 2010 Nucleus Research, Inc. Reproduction in whole or part without written permission is prohibited.
Nucleus Research is the leading provider of bottom line-focused technology research and advice.
NucleusResearch.com