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Siemens PLM Software

Teamcenter Service Lifecycle Management solutions

Using service management to achieve maximum value

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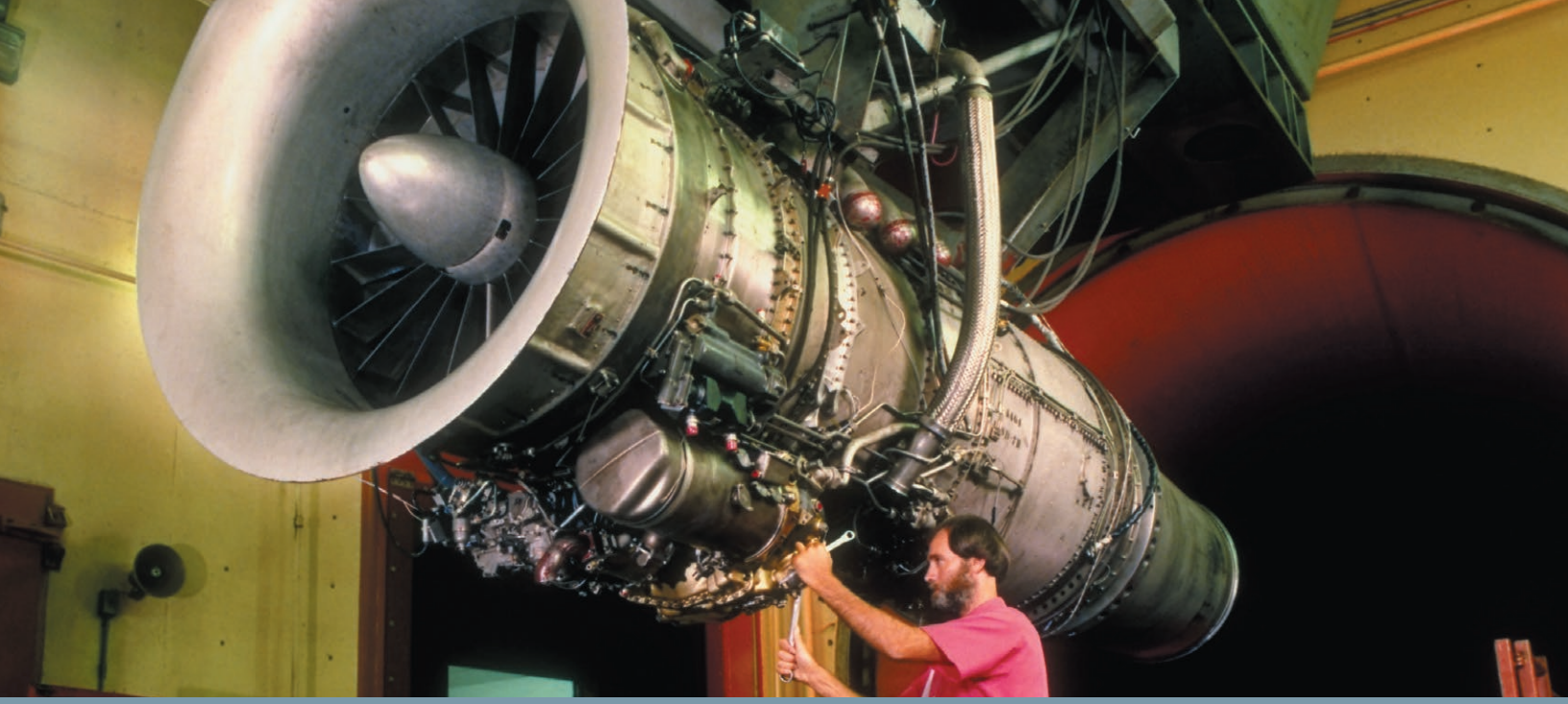


Business challenges

Highly-engineered products with long useful lives usually are very valuable to both the companies that buy them and the companies that service and support them. Getting the most from those products means maximizing availability and reliability. For the end customer, a nonoperational machine, airplane, generator or train means lost revenue that is not recoverable. As customers look to maximize the value of their investment in products, manufacturers and service providers are looking for a stable, profitable revenue stream from after-sales service. This focus on service leads to the need to develop a service lifecycle management (SLM) strategy.

For manufacturers, making the SLM strategy part of an overall product lifecycle management (PLM) vision is critical to addressing a demanding array of challenges. Many of these challenges are also faced by third-party service providers:

- Leverage engineering, manufacturing and service data. Manufacturers must leverage their design/build knowledge to establish a market advantage when they compete as service providers. Service results must be communicated back to engineering to improve product offerings
- Implement service-level and performance-based contracts. Customers expect more. Use of service contracts that measure performance issues beyond conventional hourly rate and parts replacement metrics now include availability/reliability and organizational performance factors that reflect a better understanding of products, parts, supply chain and service activity
- Reduce service cycle time and costs. Service teams must reduce turnaround time as well as the number of service events needed to resolve issues
- Increase service team productivity. Service organizations have limited resources in the form of qualified technicians, tools and parts. Getting the most of these resources helps increase profitability and capacity
- Maximize operational availability and reduce unscheduled downtime. Products must remain operational as long as possible
- Ensure compliant and complete service. Products must be serviced in a way that complies with industry and company standards

To meet these challenges for manufacturers, service providers and owner/operators, Siemens PLM Software introduces a unified approach to SLM and PLM that fulfills the vision and strategy for both. Teamcenter® software addresses service as an integral process of the entire product lifecycle. This unified approach enables manufacturers to consider product-as-a-platform-for-service and empowers service providers with a single source of knowledge and process to manage, plan and execute services.

Introducing Teamcenter SLM solutions

Teamcenter solutions enable manufacturers, owners and service organizations to support complex products with a service management environment. Companies can use this PLM-enabled, configuration-driven environment and the following Teamcenter solutions to communicate physical product definitions and maintenance information within a service-oriented context that facilitates the accurate and rapid performance of multiple service functions:

- Service asset management (SAM) provides total visibility into configuration and service knowledge for complex long-life physical products (assets), including each asset's status and service history. Service event management enables capture of the results of service activities performed in-house or outsourced elsewhere in the service value chain. The service dashboard provides insight into metrics necessary to effectively manage for commitments such as performance-based logistics (PBL) and service-level agreement (SLA) contracts
- Service planner enables organizations to develop detailed maintenance plans that form the basis for proactive service operations using preventive-, conditional- and reliability-based service models. Service planner can also be used to develop in-depth overhaul and decommission plans
- Service scheduler provides creation of work orders from plans or ad hoc demands as well as visibility into service schedules, allowing optimization of resources and service events to improve turnaround time and asset availability
- Service technician brings service information, instructions and task assignments to the technician to execute service tasks accurately, capturing service and asset information that improves first-time fix rates and reduces asset downtime
- Content management enables organizations to author and publish service documentation that can be configured and delivered to the point of need specific to the asset and end user to reduce service errors
- Reporting and analytics allows organizations to examine operational information so they can discern trends in asset performance and reliability, as well as track and analyze asset and organizational key performance indicators (KPIs)

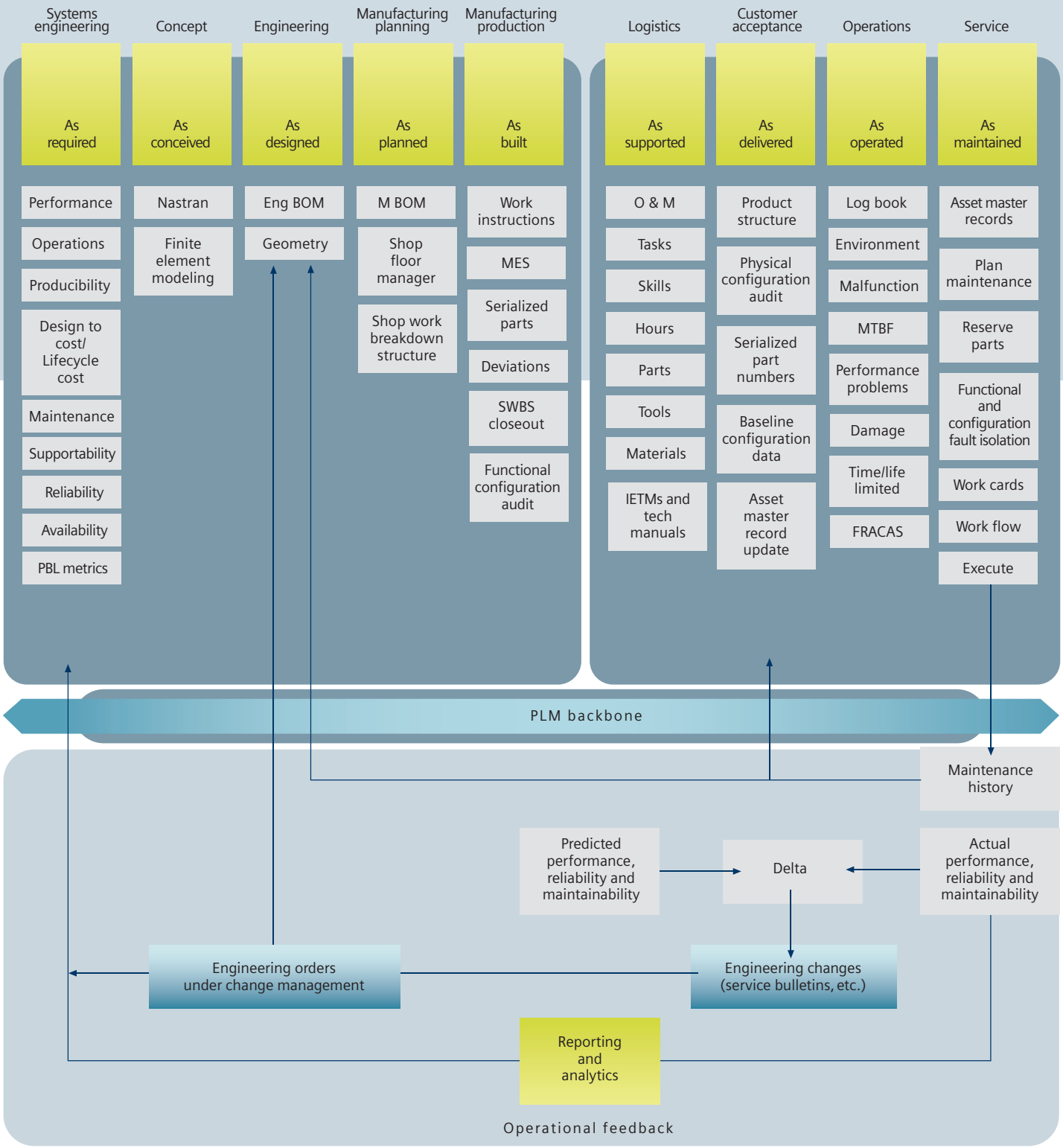
By managing service information in a secure web-native PLM environment, you can use Teamcenter to facilitate a faster, more coordinated service response. Teams can access this service knowledge at anytime from anywhere.

By providing PLM core capabilities such as workflow, change, document and configuration management capabilities, Teamcenter enables service teams to work with engineering teams in closed-loop processes that drive today's optimized inventory, warranty improvement and build-in initiatives. In addition, best practices and lean processes can be implemented and tracked across the entire service chain.

By deploying community-oriented collaboration capabilities across a PLM environment, Teamcenter empowers widely dispersed service technicians to visually exchange ideas in real-time conferences, share applications and translate their point-of-service concerns into re-usable intellectual capital.

What makes Teamcenter SLM solutions special?

Factor	Differentiation
Configuration-driven service	As product configurations evolve into as-maintained asset configurations, manufacturers and service teams have a compelling requirement to maintain configuration control, ensure regulatory compliance and tightly integrate their operations with product engineering. Teamcenter configuration-driven service capabilities provide the PLM platform for meeting this need. By capturing, organizing and accessing asset information within the context of its configuration, organizations can rapidly and accurately improve service planning and execution activities. Organizations can leverage Teamcenter to establish feedback loops that bring the service concerns of field technicians to the product and service engineers who develop and support today's complex products. Teamcenter enables service teams to understand an asset's ongoing requirements and compliance constraints. By leveraging a configured structure, service organizations can retain and access all of the information about an asset within a service-related context including inspection reports, deviations, maintenance procedures, service requirements and lifecycle limits. Teamcenter also provides the complete history of the asset along with associated support information and monitored parts.
Proven PLM platform	Teamcenter-driven PLM solutions are used to manage much of intellectual capital that defines today's highly complex assets before they reach the in-service stage. Teamcenter is uniquely positioned to link existing product and engineering data to service operations, and use those same capabilities to empower other aftermarket service organizations.
Scalability and openness	Teamcenter provides modular and highly scalable solutions that enable companies to address their highest business priorities first, without sacrificing security or performance. Organizations can deploy Teamcenter one step at a time in a phased approach that ensures rapid return-on-investment (ROI). Teamcenter-driven PLM environments can be expanded in seamless increments to satisfy the needs for growth, technology enhancement or service-team integration. Teamcenter-driven SLM solutions are delivered on an open PLM platform that protects investment while facilitating vendor independence. This open platform allows organizations to integrate Teamcenter with other mission-critical systems, as well as to rapidly accommodate new service providers and other partners.
Comprehensive lifecycle coverage	Teamcenter SLM solutions are part of the larger Teamcenter PLM portfolio of digital lifecycle management solutions. Organizations that own product responsibility from concept planning to end-of-life disposition can leverage Teamcenter to manage their entire product lifecycle. Product teams can incorporate service and reliability requirements determined during the product development cycle and feed these requirements to service organizations to properly develop objectives and procedures. Similarly, service teams can capture operational observations (such as mean time between failure, time-for-service procedures, failure codes and operational logs) and feed this information back to improve products and service.


Systems engineering
Concept
Engineering
Manufacturing planning
Manufacturing production
Logistics
Customer acceptance
Operations
Service
As required
As conceived
As designed
As planned
As built
As supported
As delivered
As operated
As maintained
Performance
Operations
Producibility
Design to cost/ Lifecycle cost
Maintenance
Supportability
Reliability
Availability
PBL metrics
Nastran
Finite element modeling
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Geometry
M BOM
Shop floor manager
Shop work breakdown structure
Work instructions
MES
Serialized parts
Deviations
SWBS closeout
Functional configuration audit
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Tasks
Skills
Hours
Parts
Tools
Materials
IETMs and tech manuals
Product structure
Physical configuration audit
Serialized part numbers
Baseline configuration data
Asset master record update
Log book
Environment
Malfunction
MTBF
Performance problems
Damage
Time/life limited
FRACAS
Asset master records
Plan maintenance
Reserve parts
Functional and configuration fault isolation
Work cards
Work flow
Execute
PLM backbone
Maintenance history
Predicted performance, reliability and maintainability
Delta
Actual performance, reliability and maintainability
Engineering orders under change management
Engineering changes (service bulletins, etc.)
Reporting and analytics
Operational feedback

Teamcenter service asset management solution

Facilitating total asset visibility and lifecycle collaboration

The Teamcenter service asset management solution provides a single source of service data that supports manufacturers as well as physical product service providers with the knowledge they require to be effective in their portions of the lifecycle. For the manufacturer, SAM bridges the gaps between product engineering, manufacturing, logistics and services with a single knowledge source that improves collaboration in any direction of the product lifecycle.

The service provider utilizes SAM to manage information anywhere it originates in the service value chain to support service operations. SAM provides service insight via dashboards and reports into product, asset and process performance metrics that are critical to achieve commitments, such as PBL and SLA contracts.

Service asset management captures, manages and provides data and metrics on a wide range of operational knowledge including:

- Configuration information that describes the complete status and history of an asset, such as removal/replacement of tracked components and operational utilization characteristics
- Comprehensive change and event histories that describe individual assets and their related parts
- Baselines and common information that combine configuration information, change/event histories, technical information and compliance standards/ regulatory requirements for each class
- External service event actions and information

- Logs of overhauls, inspections, fault codes, service bulletin incorporations and field orders
- Deviation authority and reasons for removal/change
- Discrepancies and their corrective actions

Manufacturers leverage Teamcenter configuration management capabilities to link physical product configurations (i.e., configurations that incorporate serialized part and lot tracking) with as-designed engineering configurations to link operational feedback with products for next-generation improvements.

Owners, operators and third-party service providers use Teamcenter to capture, develop and manage asset and service information in-house and from the service value chain. Subsequently, service teams can access all allowable configurations to determine what approved parts and alternate/substitute parts can be used to resolve a service event as quickly as possible.

Teamcenter service planner solution

Managing the advanced service environment

The Teamcenter service planner solution addresses the requirements of service organizations executing advanced operational models in which detailed service planning information is required for preventive, conditional or reliability-based maintenance, and to support major overhauls or decommissions.

Complex products in many industries require more aggressive services to prevent safety failures or operational interruptions.

Adoption of performance-based and service-level contracts requires a more proactive approach for servicing assets and meeting business objectives.

Service planner enables service organizations to:

- Establish plans around baseline and specific configurations of products and assets
- Define requirements and frequencies for classes of assets and specific assets
- Create and manage tasks, work instructions, resources and estimates to satisfy service requirements
- Utilize workflows to signoff on service planning elements
- Establish safety and hazardous notices for material and service tasks
- Analyze work task sequences to remove nonvalue-added steps for overall optimization
- Roll up estimates for service tasks (cost and time)
- Import and export planning information with other systems

By facilitating an environment that provides advanced services for complex assets, using Teamcenter ensures that compliant service can be accurately and effectively planned. The service organization using service planner can organize service information to reduce risk, cost and cycle time while improving asset availability and reliability.

Teamcenter service scheduler solution

Managing the service schedule

Teamcenter service scheduler addresses the needs of both reactive and proactive service organizations by enabling users to manage work orders and the creation of, and visibility into, service schedules. Enabling optimization of qualified resources, tasking and scheduling, Teamcenter enables you to reduce asset downtime and maximize service effectiveness.

Service scheduler enables service organizations to:

- Manage customer contact
- Create service catalogs of standard service offerings with estimates
- Manage service activities, including reactive and proactive service requests
- Create work orders and service from the approved service plans or ad hoc requirements
- Schedule qualified resources and equipment based on resource and asset availability
- Sequence service tasks to reduce redundant tasks and effort

With visibility into schedules, service operations can maximize the effectiveness of service events to increase asset availability and customer satisfaction, reduce service costs and cycle time and optimize service operations.

Teamcenter service technician solution

Focusing on getting the work done

Teamcenter service technician brings asset and service knowledge to the point of need to enable the technician to focus on completing the work at hand accurately, quickly and in compliance with all requirements. Through service work instructions delivered by Teamcenter Active Workspace, assignments arrive in the technician's work list along with all relevant information to reduce wasted time and effort.

Service technician empowers the technician to complete work through:

- Access to asset and service information (including history)
- Delivery of detailed service work instructions, including service procedure documentation (text, 2D/3D and animations)
- Capture of asset utilization, actual times and part movement for asset configuration updates
- Documenting discrepancies and attaching other physical documentation to the asset
- Digital signoff of work and approval that automatically updates the service schedule

Teamcenter allows the service technician to execute service work accurately and with reduced effort to improve first-time fix rate and asset reliability. By reducing the effort to accomplish service assignments, Teamcenter improves overall service operations and throughput.

Teamcenter SLM benefits

Solutions	Benefits
Service asset management	• Provides total visibility into an organization's assets under configuration control • Improves asset tracking and life usage by leveraging fully defined lifecycle bill-of-materials (BOM) • Enables rapid generation and digital distribution of service bulletins • Injects event-driven service experiences into closed-loop, product-to-service improvement processes • Incorporates service team concerns into early product lifecycle phases • Delivers global point-of-service knowledge • Manages all asset-related knowledge while providing access within the context of the asset's configuration • Enables manufacturers and service integrators to capture and incorporate asset knowledge and configuration changes that originate elsewhere in the service value chain • Provides a service dashboard that facilitates insight into asset and process performance via key performance indicators that enable successful PBL and SLA business contracts • Establishes a configured service BOM to manage all service planning information
Service planner	• Enables service compliance and planning by establishing service plans for assets and product variants • Improves service efficiency by facilitating accurate and detailed service event planning • Increases asset availability and reliability by defining service requirements and frequencies that support advanced service operational models • Enhances service quality by ensuring that approved service procedures are defined and followed • Encourages hazard and safety compliance by defining notices that are applicable to specific materials, parts, service tasks or work cards • Improves service cycle performance by facilitating faster diagnostic and service procedures tied to fault codes • Enables detailed service planning capability for overhaul and decommission work
Service scheduler	• Improves service quotes by establishing catalogs of standard offerings • Controls costs by capturing efficiency and comparing to estimates • Improves service operations with visibility into schedules for future, active and closed work • Increases utilization of resources through visibility into work assignments • Ensures qualified resources are assigned to tasks • Increases asset availability through increased effectiveness of service events to reduce downtime
Service technician	• Maximizes productivity with tasks and service work instructions delivered directly to technician at point-of-service • Ensures service work compliance with approved procedures and digital signoff of work and approvals • Improves service integrity through rapid access to applicable technical knowledge for each service task and asset • Increases asset management effectiveness through capture of configuration changes, utilization and service measures • Improves service and asset performance by retaining and delivering service experience and knowledge to the point-of-service

About Siemens PLM Software
Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of product lifecycle management (PLM) and manufacturing operations management (MOM) software, systems and services with over nine million licensed seats and more than 77,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with its customers to provide industry software solutions that help companies everywhere achieve a sustainable competitive advantage by making real the innovations that matter. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

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