Smarter Solutions for Chemicals and Petroleum

Transcript

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[Screen text]

- Continue to improve the safety, reliability and productivity of your organization's business processes
- Improve visibility into asset performance across your organization
- Align your operations, engineering, maintenance and IT strategies to support best practices in asset and service management

[Introduction]

In the chemicals and petroleum industries, producing and refining crude oil and natural gas are mission-critical activities, requiring a safe, reliable and available industry infrastructure. Enterprise Asset Management, also known as EAM, helps senior managers across operations, engineering, maintenance and IT take a strategic role in managing asset and service performance.

IBM Maximo for Chemicals and Petroleum is a leading EAM solution designed to provide chemicals and petroleum organizations with the best practices to help improve the performance of their critical assets and enable organizations to better support people, processes and technology.

[Voice over text]

IBM provides enterprise asset and service management solutions for more than 300 chemicals and petroleum organizations worldwide. These customers use Maximo to manage a wide range of assets, equipment and supporting business processes.

[Executive point of view]

In the chemicals and petroleum industries, providing safe and reliable operations are mission-critical activities. For exploration, production, transportation, refining and petrochemical companies, the management of assets such as drilling rigs, offshore platforms, onshore well-sites, pipelines, floating production and storage vessels, terminals, refineries and petrochemical facilities is a critical challenge.

Chemicals and petroleum organizations have been repeatedly challenged by the volatility of the energy industry, capital investment and regulatory uncertainty, rising energy demands and capacity constraints, an aging infrastructure, and aging workforce demographics. Senior executives must optimize smaller budgets while meeting increasing safety, security and regulatory requirements and fulfilling global energy demand.

Advances in technology such as sensors and controls, wireless communications and distributed intelligence have become industrialized applications, providing additional capabilities to drive real time

information into operational processes. Many clients are looking to manage the physical and IT assets, and their ***relationships*****,** on the same platform to provide the best solution for optimizing the service and performance of these assets.

Significant productivity improvements have been gained by automating work and asset management processes. Now companies are looking to catch the next wave of productivity improvements by adopting an integrated approach to achieve business results. By creating visibility into asset performance and workforce productivity, chemicals and petroleum organizations can better control and govern their assets. Then they can build agility into their operations through automation to enable best practices in asset management such as integrated safety, reliability and asset life cycle programs. This will help companies achieve their business objectives for the optimization of capital expenditures, and achieve cost reduction targets.

In this series of real-world scenarios, you will learn how IBM Maximo for Chemicals and Petroleum can help you:

- Continue to improve the safety, reliability and productivity of your organization's business processes.
- Improve visibility into asset performance across your organization.
- Align your operations, engineering, maintenance ***and*** IT strategies to support best practices in asset management.

[Chemicals and petroleum: condition monitoring and work management]
IBM provides an information integration framework that enables measurement points anywhere in the enterprise, against any asset having a sensor or control device—without having to know the tag ID. This information can be shared through the Web internally or anywhere in the world to support remote monitoring, performance management and supply chain optimization.

There are many ways to monitor the condition of equipment performance—ranging from simple readings through complex multi variable calculations. In many facilities, operations, maintenance and engineering resources also identify asset condition problems, and radio in the problem or input them into a logbook to generate a service request or work order. In this scenario, we are highlighting event correlation of several performance variables against a refining unit of operation using a health monitoring system.

[Scene 1] The health monitoring system or operator's console identifies a problem with a refining unit and validates that the event has not already been reported. A notification is sent to operations and IBM Maximo directly, identifying the asset, location and problem code information.

[Scene 2] Maximo's workflow interprets the notification based on predefined criteria—including reason for work, criticality of the asset, safety and environmental impact—then automatically creates a defect record. This defect is related to a critical asset and therefore the system automatically generates a high-priority inspection work order to gather further information. Notifications of the high-priority inspection work order are then sent to the asset custodian and operations.

[Scene 3] Maximo's workflow automatically approves the work order and places it with appropriate prioritization within the maintenance supervisor's queue to be assigned to a maintenance technician. Using Maximo Assignment Manager, the supervisor picks the best crew or mechanic to be deployed.

[Scene 4] Using Maximo Mobile, the mechanic receives the inspection work order, assesses the damage, takes note of what else is impacted, and determines the parts to be replaced.

[Scene 5] The mechanic uses Maximo Asset Navigator to select replacement parts and order them through an automated material request. The store room issues the parts, which are automatically added to the work order.

[Scene 6] The mechanic makes the repairs, enters one or more actions and remedies for each system and component combination, and records labor hours.

[Scene 7] The work order tracks the needed materials, tools and labor. Additionally, repair and failure codes are captured for use in reporting KPIs and asset performance. Warranty items are identified on the work order and at the store room when parts are issued.

[Scene 8] At any time during this process, authorized personnel can generate an incident, investigation or improvement for additional review and analysis for continuous improvement.

[Scene 9] Here, you can review the business process for the scenario we have just described.

[Chemicals and petroleum: management of change]

There are many reasons for change in the chemicals and petroleum industry, including regulatory compliance, mechanical integrity and safety improvements. Managing change is a critical process to ensure safety and reliability within the industry.

In this scenario, we are highlighting the management of a deferral request for a safety critical preventive maintenance work order.

[Scene 1] Most regulations are not prescriptive in terms of the specific activities an asset owner needs to demonstrate for compliance. IBM Maximo allows a company to associate various regulations with an asset or location, or both, to demonstrate the association of regulations to those assets. The details of the actual compliance or inspection work are normally captured in a job plan, but associated to the regulation. Therefore, a regulatory inspection is normally carried out by a regularly scheduled work order or preventive maintenance work order that is associated with the job plan details that illustrates how a company complies with the regulation.

[Scene 2] A preventive maintenance work order is generated to test a fire pump based on a schedule determined by a regulatory requirement. During the daily operations meeting and review of safety critical work, it was determined that existing work in the same location created risk associated with the temporary cessation of the fire pump for the new work order. It is agreed that the fire pump test work order should be deferred and a management of change, also known as a MOC, is raised to defer the work.

[Scene 3] The MOC includes scope and deferral justification, and sets the deferral to temporary until the other work in the area is completed. The MOC is saved, and Maximo's workflow directs the MOC to operations for their verification.

[Scene 4] Operations verifies the MOC request, and assigns the maintenance supervisor as the owner. The maintenance supervisor adds reviewers and approvers, as well as pre-start actions including risk assessment and work order date modifications, and post-start actions.

[Scene 5] Maximo's workflow then routes the MOC to an engineering manager and safety managers for their review of the asset history and MOC history. The safety manager contacts the operations supervisor doing work in the existing location and confirms the high risk associated with also taking on the fire pump testing work order. The safety manager confirms that there have been no previous failures or deferrals, and then approves the MOC request.

[Scene 6] The Pre-Start action modifies the target date of the fire pump test work order based on the target completion of the existing work in the same location.

[Scene 7] Three weeks later, following the completion of the original work order, the fire pump test work order is re-entered into the work queue, then scheduled and assigned using Maximo Assignment Manager. The work order is then completed and closed out.

[Scene 8] The Post-Start actions on the MOC include review of the completed work order. Having identified there were no issues uncovered, the MOC is closed.

[Scene 9] A complete audit trail identifying the entire process and those involved is now available for organizational usage, continuous improvement and regulatory compliance.

[Scene 10] Here, you can review the business process for the scenario we have just described.

[Chemicals and petroleum: regulatory compliance]

The chemicals and petroleum industries are subject to multiple environmental laws and regulations—including air emissions, water quality, wastewater discharges, solid wastes and hazardous material, and substance management. These laws and regulations generally require organizations to obtain and comply with a wide variety of environmental registrations, licenses, permits, inspections, and other approvals. Failure to comply exposes the organization to fines, penalties, and possible interruptions in its operations. Regulatory compliance costs are a critical component of the industries' cost of service, so improving how they manage compliance can represent millions of dollars.

In this scenario, we are highlighting how IBM Maximo can help ensure compliance at lower costs primarily because compliance becomes part of the existing process, versus an adjunct process which many companies have deployed.

[Scene 1] A compliance analyst from the Health, Safety and Environmental, or HSE, organization is responsible for keeping the association of regulations with locations and assets within Maximo. First the analyst updates the regulatory application that inventories and categorizes all the applicable regulatory requirements for the facilities under consideration.

[Scene 2] As notifications and updates are received from the regulator, the analyst can easily find the affected locations using a "where used" search, and then update those locations based on the regulatory change.

[Scene 3] Scheduled inspections based on regulatory requirements generate work orders. The work order pulls in the regulatory requirement information from the location and any specific regulatory requirements are specified on the job plan associated with the inspection.

[Scene 4] The maintenance planner reviews the work order against other work orders in the queue, updates the work order and prepares for scheduling.

[Scene 5] The maintenance scheduler reviews the work order details and schedules it based on priority of work and crew and labor availability.

[Scene 6] The maintenance supervisor uses Maximo Assignment Manager to assign the work order to a specific resource.

[Scene 7] The maintenance technician performs the inspection based on the job plan details, records findings, tools, materials and labor used to complete the inspection. If appropriate, the maintenance technician can raise an incident for a failed inspection, requiring further analysis and investigation.

[Scene 8] A complete audit trail identifies the entire compliance process, those involved, and steps executed. At any time this same history can be queried or used to generate internal and external audit and compliance reports.

[Scene 9] Here, you can review the business process for the scenario we have just described.

[Chemicals and petroleum: incident management and defect elimination]
There are many ways to drive improvements around safety and equipment reliability in the chemicals and petroleum industries. Although they may have different names from customer to customer, many utilize incident management as a way to improve safety and defect elimination as a way to improve equipment reliability.

In this scenario, we are highlighting how IBM Maximo provides solutions for incident management and defect elimination as part of an integrated work and asset management environment that encourages and enables collaboration between operations, maintenance and engineering disciplines.

[Scene 1] A maintenance technician is assigned a work order to replace a high-pressure separator drain value after it had been reported as failing to open on demand. During work execution, a substantial leak occurred, despite proper closure of the isolation valves. The maintenance technician creates an incident of type “environmental” to track the details of the incident.

[Scene 2] Raising the incident from the work order automatically creates a relationship between the original work order and the incident, and populates much of the incident information from the work order, saving time on data entry.

[Scene 3] The asset custodian, as well as the environmental analyst, receives performance information and KPIs related to incidents in their area of responsibility, identifying troubled locations, assets, processes or procedures. Since this incident type is “environmental” and represents a near miss on loss of containment, Maximo’s workflow automatically creates an investigation record from the incident.

[Scene 4] The investigation is then routed to those responsible for conducting a root cause failure assessment, also known as a RCFA. Upon completion of the RCFA, various outcomes could occur, including corrective action, improvement recommendation, a management of change request, or simple closure of the investigation, noting the lessons learned.

[Scene 5] An operator, performing daily rounds, notices a motor running at an abnormal temperature. The operator raises a defect with proper defect classification, identifying a potential problem with the motor.

[Scene 6] The asset custodian, as well as engineering, receives performance information and KPIs related to defects in their area of responsibility. The engineer notices that the defect service level on this particular motor exceeded the service level and therefore warrants further investigation.

[Scene 7] As the engineer takes ownership of the defect, a notification is automatically generated to operations and maintenance personnel, identifying that the defect is being investigated by engineering. Engineering reviews the conditions with the manufacturer, and it is agreed that the motor should be repaired before any significant damage occurs.

[Scene 8] The engineer generates a repair work order from the defect, retaining the relationship of the original defect and the new work order, as well as populating the new work order with much of the required information. The operator and asset custodian are notified that a repair work order is being generated to resolve the issue with the motor.

[Scene 9] Here, you can review the business process for the scenario we have just described.