

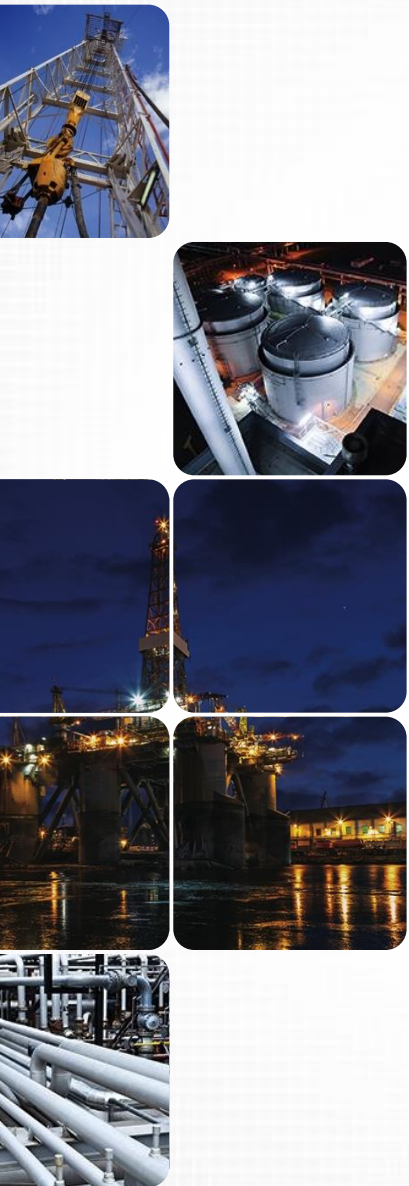


Asset Performance Management for Collaborative and Integrated Operations

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Agenda

- Definitions
- Eco system
- Process
- Integration to business
- Visualization



Integrated Operations (IO)

New work processes and ways of performing oil and gas exploration and production which is facilitated by new information and communication technology.

..... Collaboration with a production focus

Asset Performance Management (APM)

encompasses the capabilities of data capture, integration, visualization and analytics tied together for the explicit purpose of improving the reliability and availability of physical assets. APM includes the concepts of condition monitoring, predictive forecasting and reliability-centered maintenance (RCM).

Gartner.

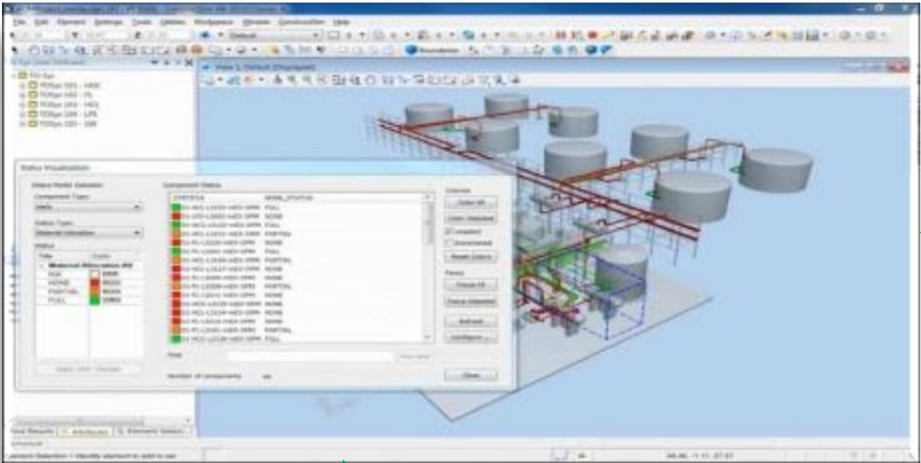
Where are our opportunities?

- Integrated and repeatable processes for all assets
- Integration of quality data: design, operation etc (big data)
- Integrated visualization
- Integration of reliability processes with operation performance
- Prediction and Optimization

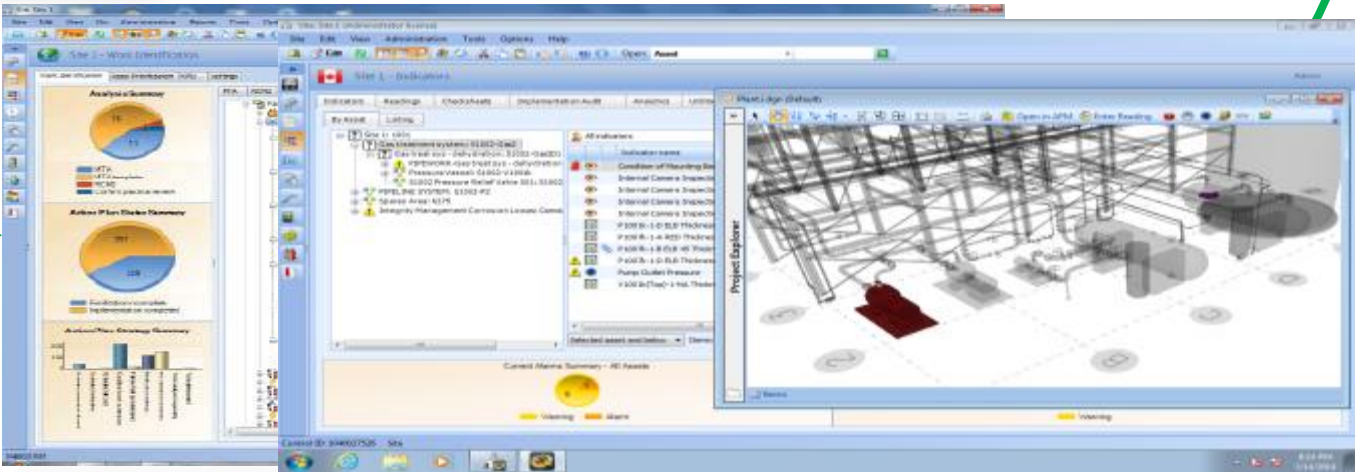
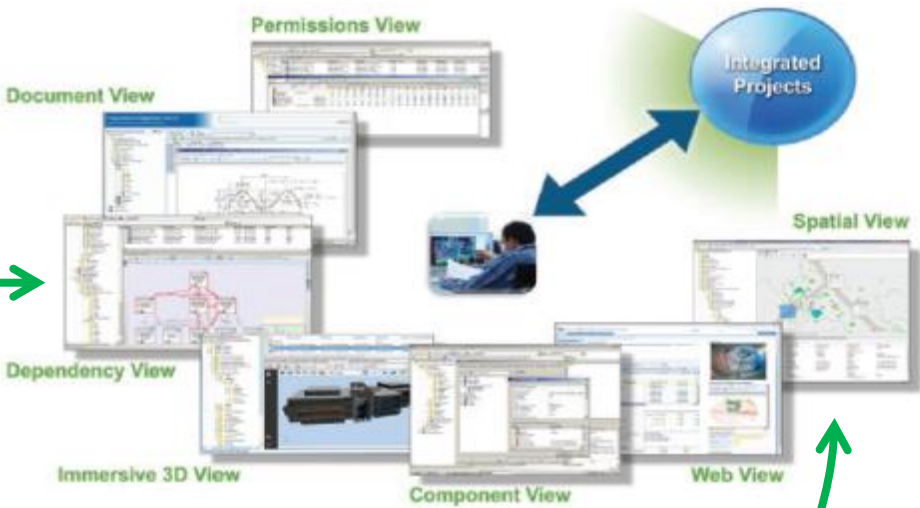
Benefits: Cost savings, few people in 'hot' areas, improved efficiency, reduced risk

Integrated ECO System

Analysis and Design



Installation



Operations and Maintenance

APM Solution Focus for Refinery

Risk Based
Inspections

Asset Health
Monitoring

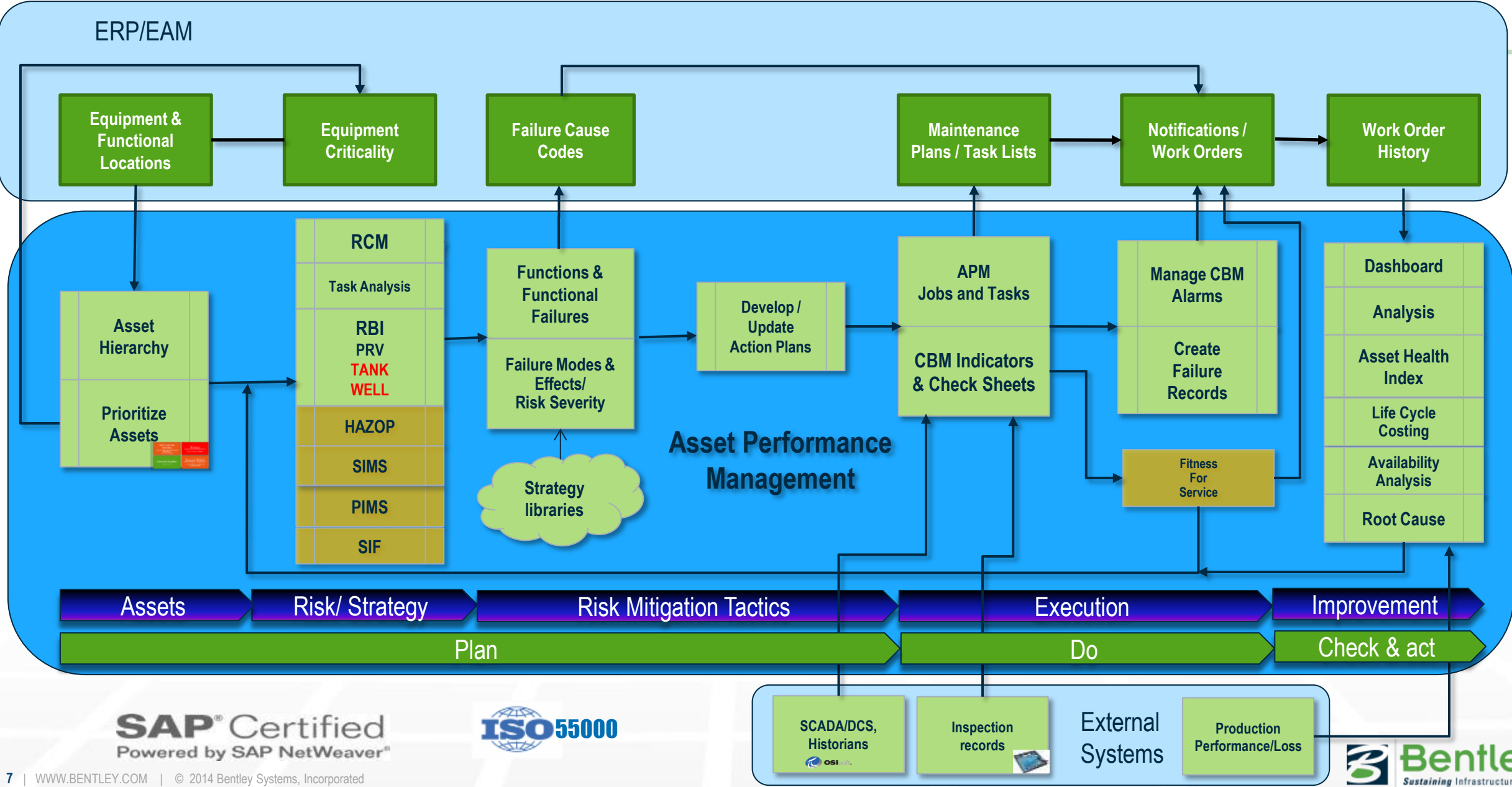
Reliability Centered
Maintenance

Root Cause
Analysis

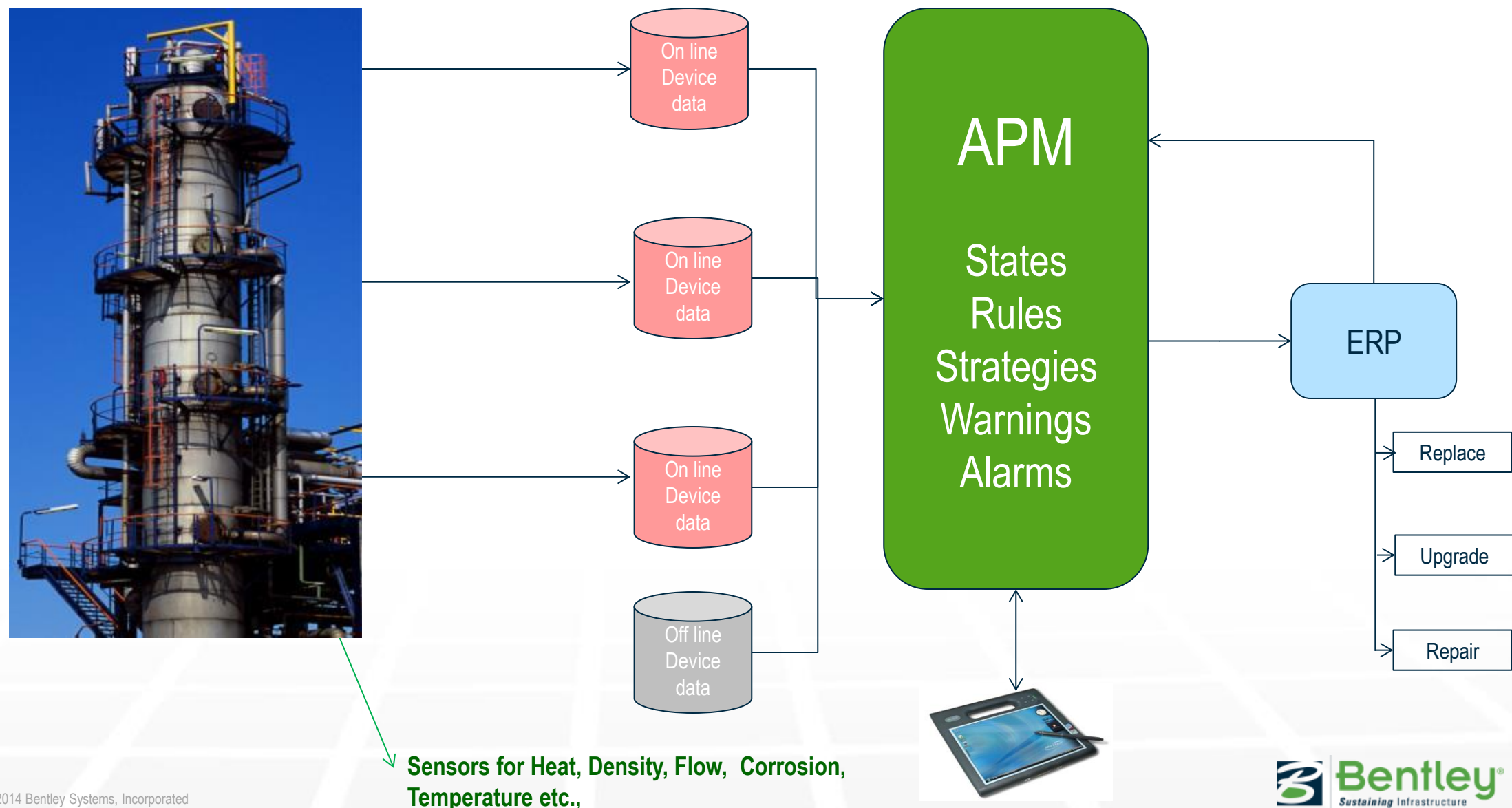


VIZUALISATION, MOBILE SOLUTIONS, OPTIMISATION

Asset Performance Process flow



Using production and asset data for reliability



Risk Analysis

Maintenance action plan (Administrator license)

Action plan Edit View Tools Options Help

Open: Asset

Views

Facilitation

Optimization

Implementation

History

Analysis

Analysis: 00000001

Analysis type: RBI

Title: Corrosion Loop: Sup

Asset

Asset: 6748

Name: Super Heater...

Location: ABC.US.....

Failure mode

Failure mode: Degradation of a metal as a result of reaction wit...

Task

Status: Facilitation incomple

Type: Inspections

Description:

Failure Mode: Degradation of a metal as a result of reaction with oxygen at high temperatures.

6748-Super Heater tubes Corrosion Group1

General

Degradation Rates

Risk Analysis

Failures

History

Action Plan

Details

Notes

Failure mode

Reference: 1 7

Asset: 6748

Browse...

Impacts: Super Heater tubes Corrosion Group1

Failure mode: Degradation of a metal as a result of reaction with oxygen at high temperatures.

Criticality

Confidence

Summary

Note

Probability...

Not analyzed

High

Medium

Low

Negligible

Low

Medium High

High

Extreme

Extreme

Low

Medium

Medium High

High

Extreme

Negligible

Low

Medium

Medium High

High

Medium

Medium High

Economic...

Not analyzed

Slight Damage < \$10K

Minor Damage \$10K - \$100K

Local Damage \$100K - \$1M

Major Damage \$1M - \$10M

Extensive Damage > \$10M

Health and Safety...

Not analyzed

Single Injury

Minor Injury

Major Injury

Single Fatality

Multiple Fatalities

Environmental...

Not analyzed

No/Slight Effect

Minor Effect

Localized Effect

Major Effect

Massive Effect

Consequences:

Not analyzed

Negligible

Low

Medium

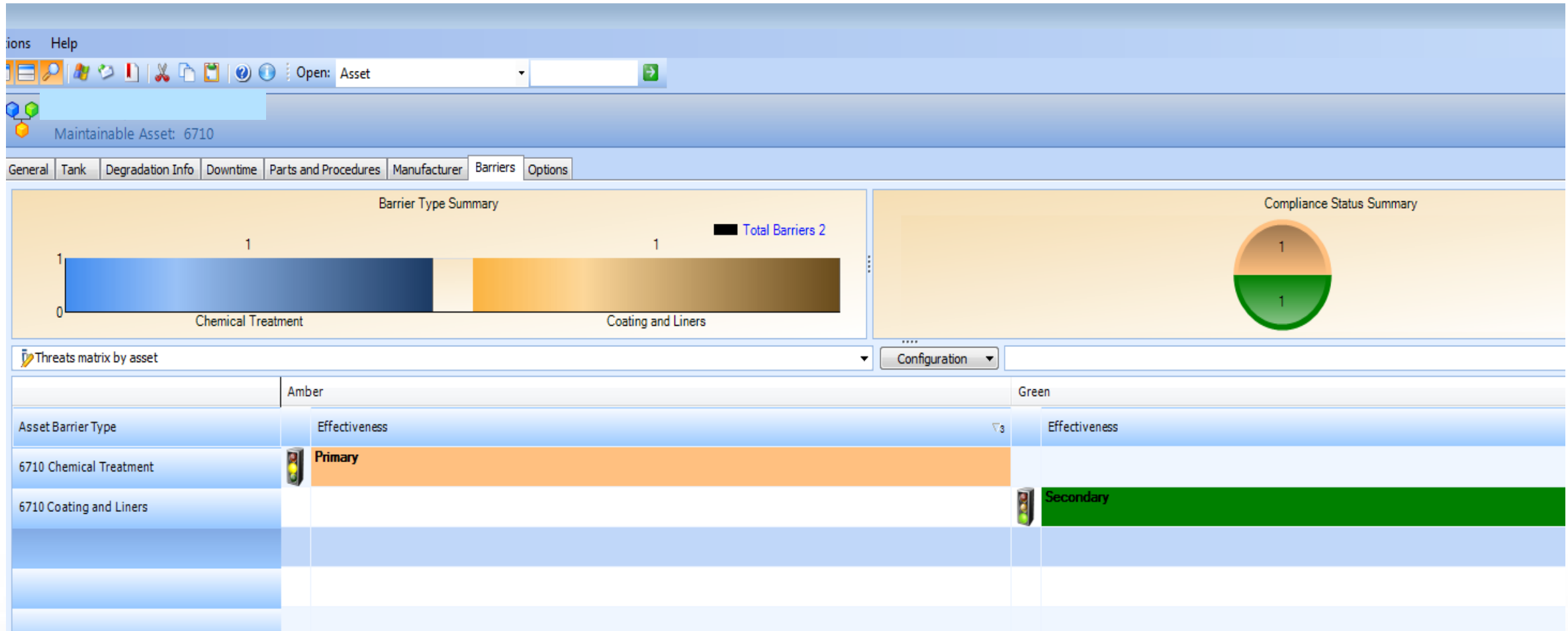
High

Extreme

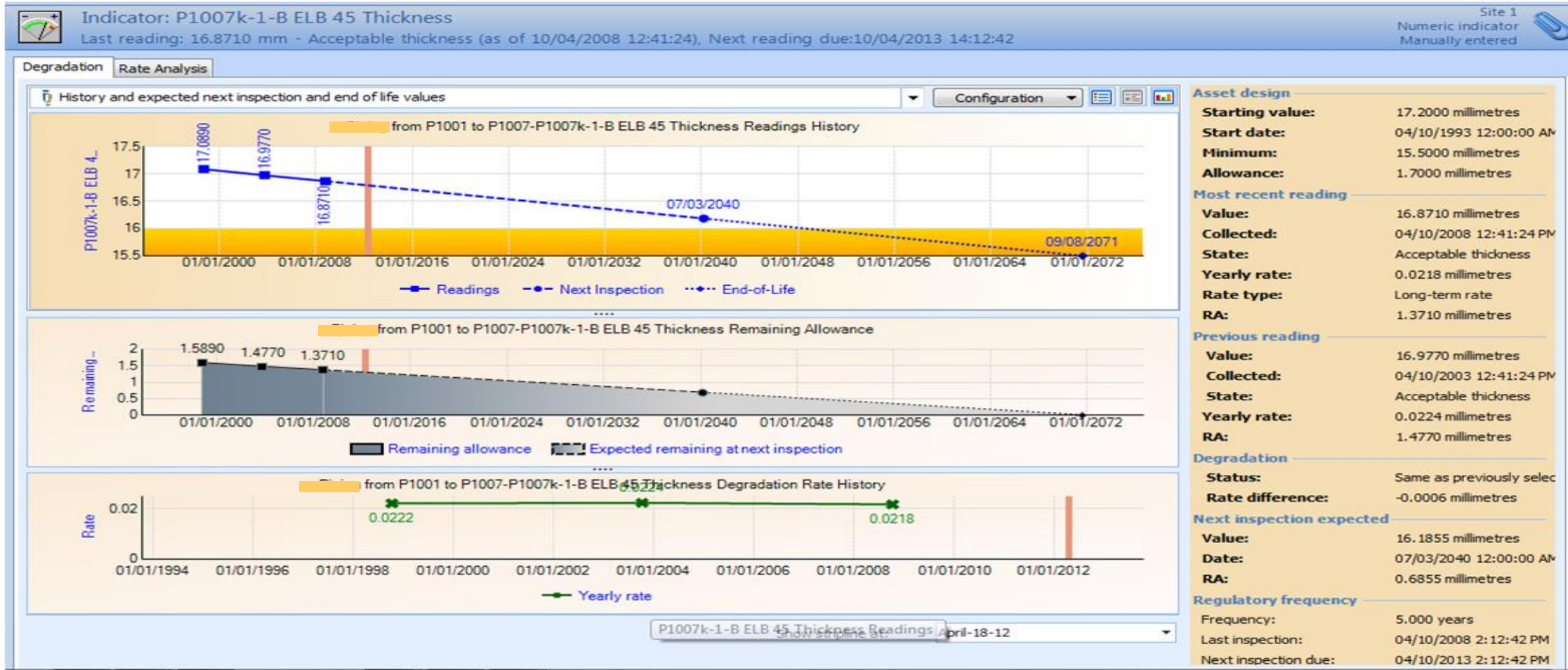
Note:

Break down of Super heater will lead to shut down of Boiler and the Power plant

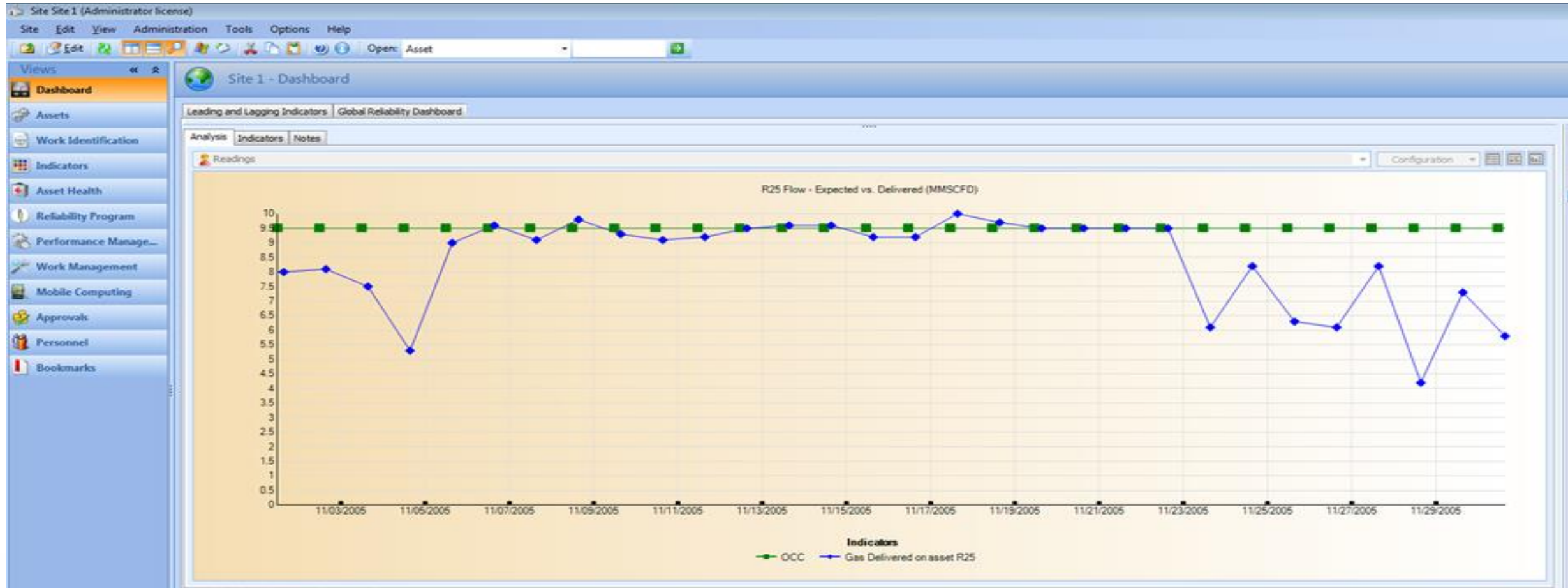
Protective Barriers for Risk mitigation and Effectiveness



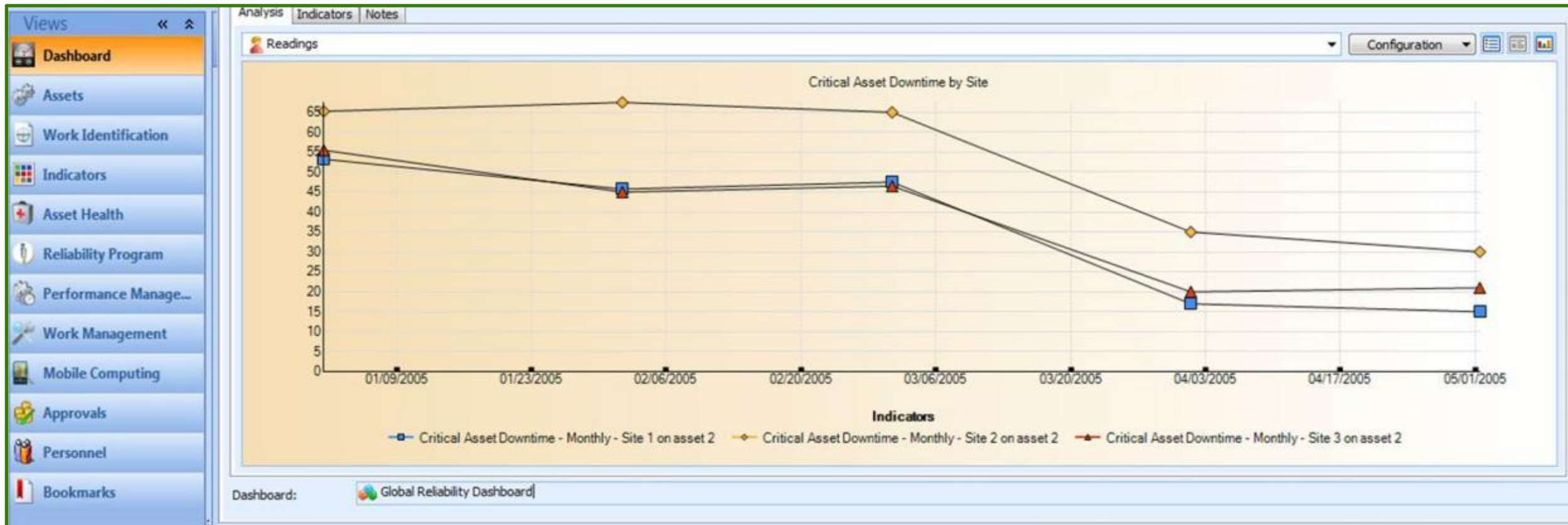
Degradation Indicator – predictive technology / remnant life



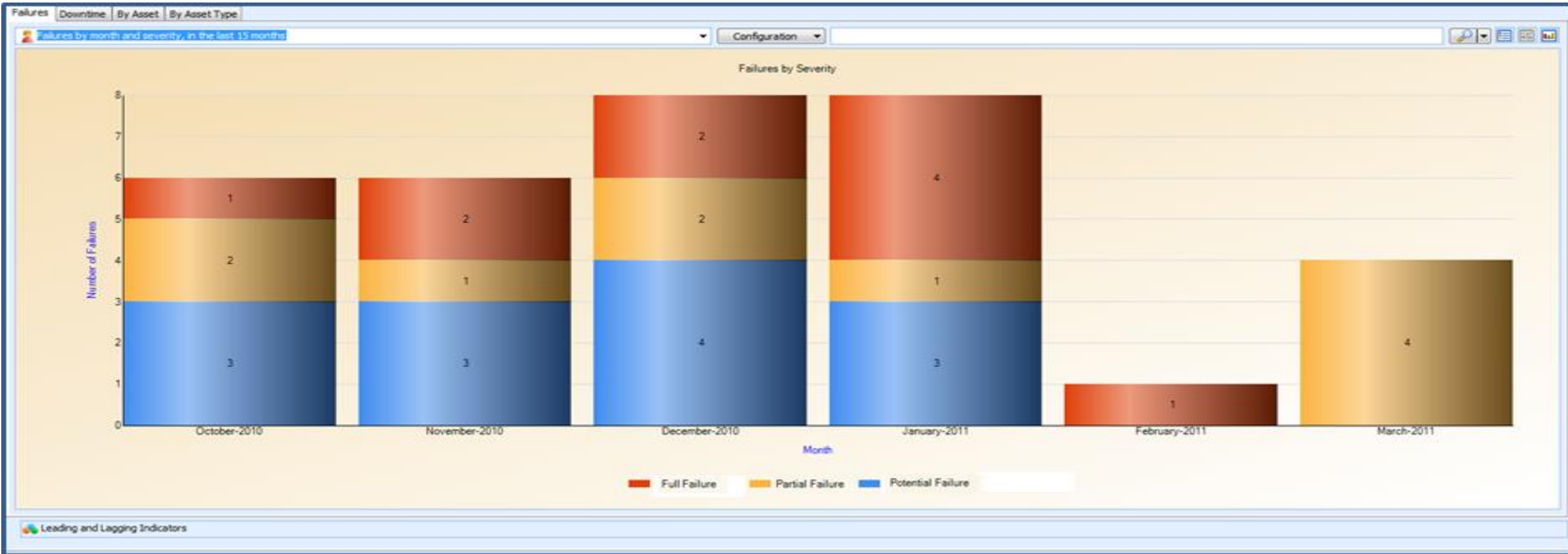
Production Analysis – Planned vs Actuals



Lost Production – Critical Asset downtime

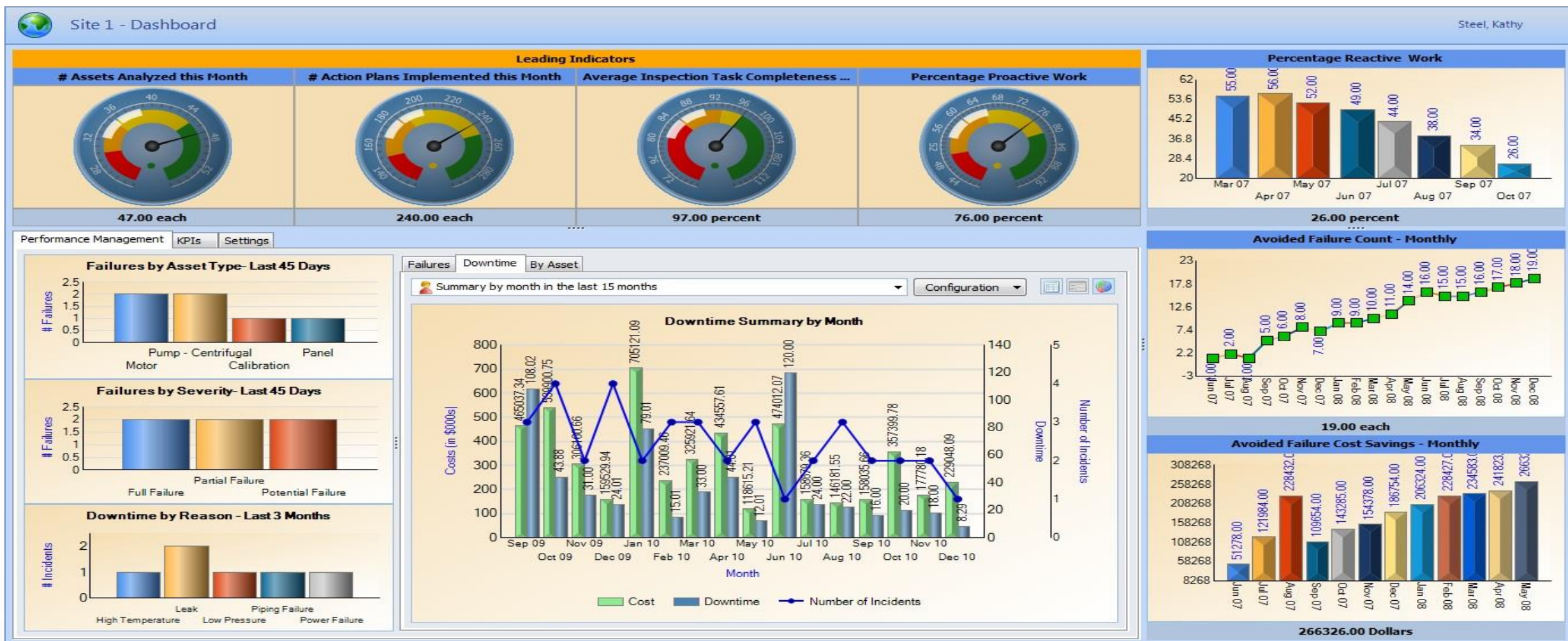


Bad Actors - Incidents by Severity

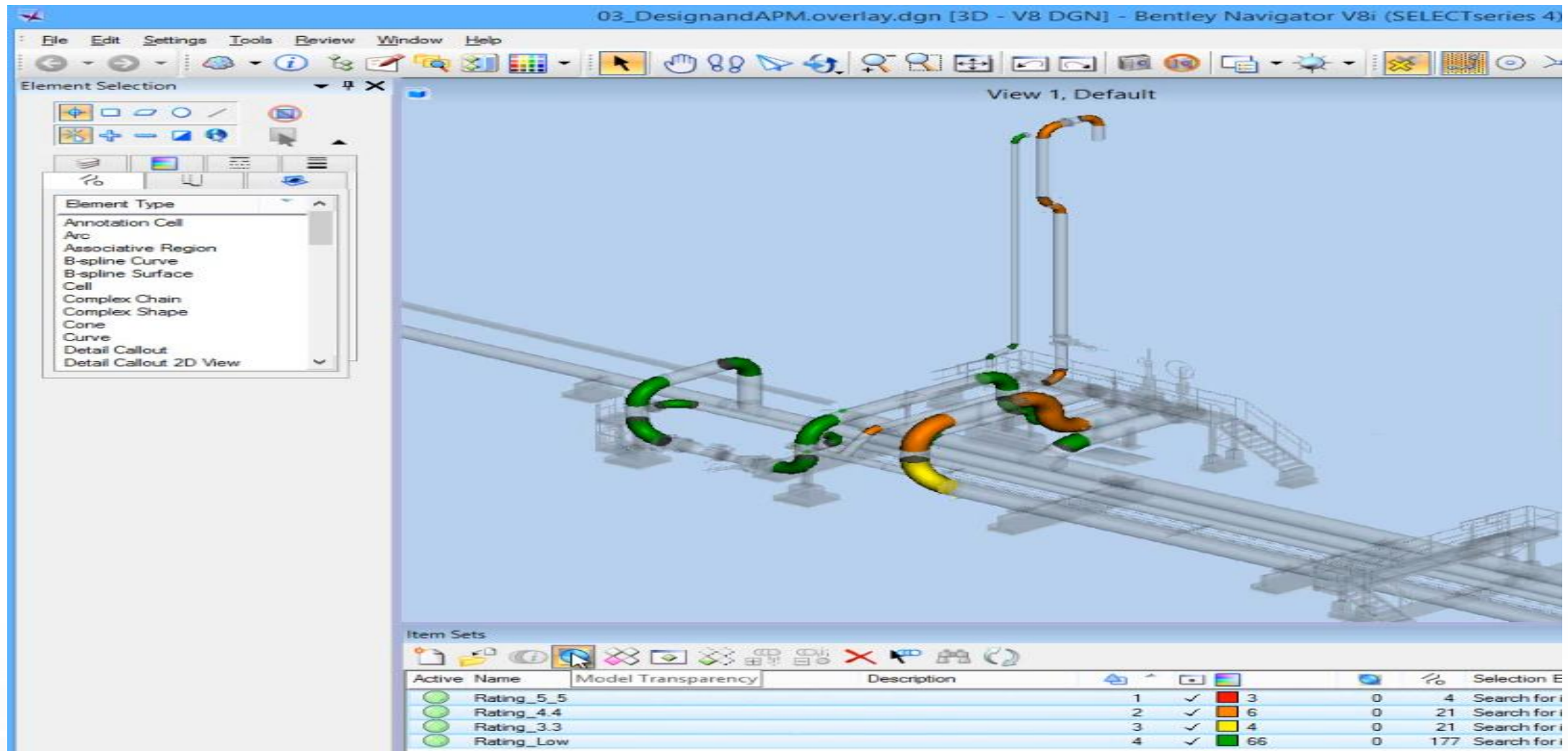


Bad Actors are incidents which are responsible for Production slippage. The above Graph shows the Bad Actors reported in RED. Production data can be merged as line graph over the stacked bar.

Dashboards



Next Gen Mobility Solutions – Visualization



Thank You



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