T25 - Leverage the Digital Enterprise to Maximize Asset Performance
Manufacturing Operational Challenges

- Pressure on efficiency and reliability
- Shrinking expertise in workforce
- Aging assets
- New assets increasing in complexity
- Increasing regulatory pressures

Manufacturers spend 40% of their time on reactive maintenance vs. their 12% ideal (Maintenance Technology)

$20B Cost Of Unscheduled Down Time

8% Is spent figuring out if there is a real problem
21% Is spent diagnosing the problem
47% Is finding the resources to fix the problem

76% of the time before the fixing even starts
Asset Management Transformation Need

Industry Drivers

Asset and Plant Optimization

Business Values

Improved Asset Utilization

Table I: Top Performers Earn Best-in-Class Status

<table>
<thead>
<tr>
<th>Definition of Maturity Class</th>
<th>Mean Class Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Best-in-Class:</strong></td>
<td>3.5% Unscheduled Asset Downtime</td>
</tr>
<tr>
<td>Top 20% of aggregate</td>
<td>89% Overall Equipment Effectiveness (OEE)</td>
</tr>
<tr>
<td>performance scorers</td>
<td>+24% Return on Assets (RoA) vs. Corporate Plan</td>
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<tr>
<td></td>
<td>-13% Reduction in Maintenance Costs</td>
</tr>
<tr>
<td><strong>Industry Average:</strong></td>
<td>8.3% Unscheduled Asset Downtime</td>
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<td>Middle 50% of aggregate</td>
<td>83% Overall Equipment Effectiveness (OEE)</td>
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<tr>
<td>performance scorers</td>
<td>+4% Return on Assets (RoA) vs. Corporate Plan</td>
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<td>-4% Reduction in Maintenance Costs</td>
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<td><strong>Laggard:</strong></td>
<td>16.9% Unscheduled Asset Downtime</td>
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<td>Bottom 30% of aggregate</td>
<td>69% Overall Equipment Effectiveness (OEE)</td>
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<td>performance scorers</td>
<td>-7% Return on Assets (RoA) vs. Corporate Plan</td>
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<td>+1% Increase in Maintenance Costs</td>
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</table>

Source: Aberdeen Group, December 2013

Best-in-Class are performing with 3.5% unscheduled asset downtime
Asset Management & Performance Strategies

Best-in-Class are performing at +24% Return on Assets per plan
Asset and Plant Optimization

Improving the operational and financial performance of production assets by delivering data-driven, asset management services
Maximize Asset Performance

END USER
Exceed Productivity & Efficiency Goals

SMART MANUFACTURING

OEM
Innovation to Drive Differentiation

SMART MACHINES & EQUIPMENT

Lower Total Cost of Ownership
Improved Asset Utilization
Enterprise Risk Management

Connected Information
Monitoring & Improving
Smart Machines & Equipment

Information-enabled

Real-time Diagnostics/Analytics

Simplified Integration

Minimize Downtime Impact

Remote Monitoring and Analytics

On-Premise Gateway

Networked Automation Assets

Preventive Maintenance

Asset Performance
Maximize Asset Performance

- On-premise automation and data utilization
- Plant-wide asset management
- Enterprise management of asset health, uptime, and risk mitigation
- Reduce cycle time to restore
- Leverage common data model
- Manage proactive maintenance across enterprise
- Predict failures to eliminate or mitigate downtime faults

END USER
Get Ahead
Get Informed
Get Connected

SMART MANUFACTURING
Innovation to Drive Differentiation

OEM

Exceed Productivity & Efficiency Goals

SMART MACHINES & EQUIPMENT
Household Goods Company

**Goal:**
- Improve equipment uptime to 95% from 91% currently
- Reduce overall MRO costs by $135M of PY $900M budget

**Challenge:**
- Central engineering group struggling with machine obsolescence; extended downtime
- Plant maintenance team re-establishing equipment PMs and inventory; not enough time

**Solution:**
- Leverage primary platform vendors and strategic OEMs for modernization roadmaps and asset management services

**Household Goods Company Background:**
- Multiple plants across three states
- Director of Engineering & Maintenance
- Mixed equipment vintages
- Lines integrated via networks
- Reliability program via TPM

**Use Case Scenario – Asset Performance**

- What is my equipment utilization?
- What are the major downtime causes?
- How are we preventing extended outages?
- What equipment should be migrated? When?
Enterprise Program Manager:
- Dynamically prioritizing modernization plans per health risks and performance on web machines
- Adjusting Maximo PM work orders per event rules deployed on converting assets; CbM w/ IA

Maintenance Engineer:
- Triggered alert on Kinetix® torque, temp, current feedback event per failure mode analysis
- Storeroom notification for motor, gearbox repair, then managing inventory levels, lead times

Web Converting Machine:
- ControlLogix® based control on ControlNet
- Motion drives on Sercos
- Integrated motors, gearboxes
- Line integration w/ safety and SCADA systems

Solution Summary

System Capabilities:
- Automated Asset Tracking
- Asset Health & Performance Monitoring
- Enterprise Asset Lifecycle Management

Service Outcomes:
- Evergreen Inventory Spares
- Equipment Risk Mitigation
- Proactive Maintenance

Business Value:
- Greater OEE, Uptime
- Improve MTTR, MTBF
- Cost reductions, greater profits
**Connected Information**

**Current Device Status**

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<tr>
<th>Site</th>
<th>Group</th>
<th>Position</th>
<th>Asset Id</th>
<th>Product Type</th>
<th>Last Scan</th>
<th>Series</th>
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- Asset baseline review and solution feasibility
- DRS system startup and commissioning
- System infrastructure and support as a service

**DRS Logix based data collector:**
- Auto discovers and monitors your thousands of Allen-Bradley® & third-party devices on DeviceNet, ControlNet, EtherNet/IP and Sercos across the plant

**General CIP™ Device Profile:**
- Manufacturer
- Device Name
- Device Type
- Serial Number
- Firmware
- Node/IP
- Status

**Health/ Performance Allen-Bradley® Profiles:**
- PAC Processors
- PLC Processors
- Logix Comms Modules
- Logix I/O Modules
- Network Gateway Devices
- Electronic Overloads
- PowerFlex® Drives
- Kinetix® Servo Drives
Maintenance-reliability engineers will manage asset health trends/event triggers sustaining high operational state, while proactively reducing control equipment risks.

Build out and sustain event triggers for identification and verification stages within DRS system.

Event rules driving asset utilization per device condition limit triggers and asset performance data.

- Three-year strategy roadmap with smart milestones
- Configuration of analytical triggers/event rules
- Specialist working sessions; executing strategies
Our engineers and program managers provide a critical role in the Diagnostic Reliability Service, through proven processes and resource tasks.

- Annual reliability strategy workshop
- Quarterly reliability improvement project working sessions
- Expertise availability to further augment your team towards your asset and plant optimization goals

✓ Annual workshop prioritizing improvement projects
✓ Reliability specialists leading optimization initiatives
Household & Personal Care Industry / USA
Asset Management & Reliability Solution

CHALLENGE

- Equipment reliability issues on motion motor/drive systems; seeking to reduce quantity of unscheduled downtime events
- Limited workforce time and specialization to perform proactive maintenance and failure elimination work on electrical automation controls class of equipment
- Significant quantity of converting equipment with mixed vintages of control devices, requiring disciplined asset management processes
- Seeking automated method of capturing installed inventory parameters, device fault information, and asset health analytics

SOLUTION

- Diagnostic Reliability Service
  - Smart device inventory and maintenance data collection
  - Data management system correlating data and events
  - User-specific dashboards and actionable reports

- Modern Asset Management Program
  - Inventory optimization using bar code/device tagging, Diagnostic Reliability Service auto tracking, and EAM software
  - Robust repair process management, ensuring consistent cost savings through quality parts, quick turnaround, low failure rates, and supply chain improvements
  - Asset Reliability Professionals working daily to drive reliability improvements across critical equipment

RESULTS

- Expanded Asset Management Program, driving equipment reliability outcomes
  - Intelligent systems providing device health indicators against baseline
  - Inventory and device event history, root cause for MTBF improvements
  - Proactive maintenance reliability services reducing MTTR on converting assets
# Oil & Gas Industry
## Diagnostic Reliability Service

**CHALLENGE**

- Accurate management of control assets
  - Accuracy and completeness of control asset records
  - Spares inventory correctly supports installed base
  - Sustainability of enterprise system data records
  - Verify asset lifecycle management
- Multiple sites within a region with many layers of devices and systems
- Regulatory and compliance requirements

**RESULTS**

- Diagnostic Reliability Service implemented on 6 site locations (~7,000 devices managed)
  - Online monitoring and auditing
  - Ongoing equipment health trending within dashboards
  - Proactive maintenance activities that are driven by analysis
  - Asset Management improvement plan roadmap to drive operational and maintenance efficiencies

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**SOLUTION**

- Implement Rockwell Automation® Diagnostic Reliability Service
  - Including network assessment
  - System implementation to IT requirements
  - User training with specific dashboard design
  - Ongoing service contract
Thank You!