

# RIS: The right move

Reliability Integrated Solution: The strategy for getting the most out of assets

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Strategic thinking when facing a tough challenge requires recognizing how to make optimal use of all available assets. A chess player, for example, who chooses to exclude some of his chessmen from his strategy, is inherently disadvantaging himself. This is no different in manufacturing processes. No matter how good a company's other strategies are, it cannot, for example, afford to ignore the consequences of unplanned equipment downtime when it is seeking to maximize efficiency and productivity.

Companies are dealing with global competition, rising energy prices, fast-changing market requirements, shorter lead times and a shifting labor pool. Market dynamics mean they must make optimal use of their installed base. Although automation is a high contributor to increased plant profitability, the return on investment (ROI) of the installed assets has yet to achieve its maximum. ABB's RIS helps plant operators achieve this optimization by making better use of their assets.

Unavailable and underperforming assets are production drains and missed profit opportunities and often lead to a lower quality product. Un-scheduled and often unnecessary maintenance leads to the underutilization of operational assets; and moreover limit the life-cycle profit and financial returns of the installed capital.

To tackle these losses, a balancing act between high asset availability and low-cost demand is required, supported by a proactive business strategy with clearly defined metrics.

ABB's answer is Reliability Integrated Solution (RIS). RIS delivers the path to implement a successful asset optimization strategy using advanced technology. It uses a consultative maintenance and production-oriented approach to drive sustainable results **Factbox 1**.

### Positioning

ABB's Reliability Integrated Solution (RIS) is a package providing the technical, managerial and service components that a company needs to successfully define and implement its asset optimization strategy.

The introduction of an asset optimization solution into a company is more than a one-project exercise, and can certainly not be achieved overnight. Consequently, executive commitment is crucial in bringing the various maintenance and production teams to adopt the common goals and metrics required.

RIS's asset stewardship focuses on cost reduction, productivity and several aspects of the asset life cycle:

- Increase and ensure asset availability
- Reduce the life-cycle cost and extend the asset's life span
- Drive productivity by advanced maintenance strategies
- Aligned business and production goals through improved usage of installed base

To achieve these targets, RIS is built on a combination of ABB's asset optimization automation solutions and extended industry knowledge, expertise and maintenance methodologies. RIS is deployed in both a focused and continuous way. Three main phases are distinguished:

- Allocation of critical assets under assessment of the actual situation with a focus on lost opportunities. These are then benchmarked against the performance indicators of the world's best reliability performers. Further implementation of asset optimization strategies are deployed from these findings.
- Introduction, implementation and integration of real-time asset optimization technology to support advanced maintenance strategies.
- Sustainable profit growth by cross-functional and continuous improvement strategies.

### RIS in action

ABB's RIS is applicable in a wide selection of industries, ranging from chemical plants to mining, and presents a scalable and incremental solution for asset optimization.

As a starting point in the implementation of RIS, a process, an item of equipment or a group of assets is selected. Within any such selection, the components to be focused on when seeking improvements are those that have an impact on the plant's productivity as

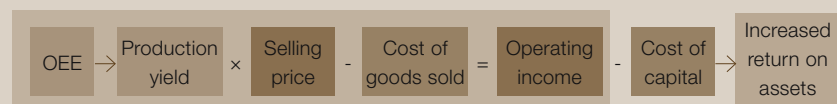
reflected in key performance indicators (KPI) such as the overall equipment effectiveness (OEE). The expansion of this process area and the inclusion of additional assets can be engineering in an efficient way using ABB's System 800xA platform as a backbone.

### Phase 1: Criticality analysis, benchmarking and assessment

A criticality analysis, benchmark and loss-opportunity assessment are critical process steps in the successful selection of the best asset optimization strategy. These steps all deploy technical and service-oriented components of RIS. The criticality analysis is performed to prioritize the assets that affect the major asset life-cycle costs and productivity. This classification of critical assets also forms the basis for defining loss opportunities and potential OEE improvement.

The plant-performance benchmark focuses on a series of maintenance KPIs, reflecting the actual situation, and comparing these against "world class" standards. This positions the company or process relative to the globally best maintenance and pro-

**Factbox 1** Benefits of Reliability Integrated Solution (RIS)



The target of RIS is to enable maximum production at minimum cost. The production yield of sellable products is represented as overall equipment effectiveness (OEE) and is one of the main key performance indicators (KPIs) that reflect the real utilization of production and automation assets. OEE is not only limited to the shop floor but is an important KPI for all levels of the company from operations to plant management. Availability and performance of the installed assets and their resulting product quality have direct impact on the ROI of assets. When these assets are not operational or not contributing to the production of a sellable end product, capital is being wasted.

An increased OEE also opens the opportunity to reduce maintenance cost because higher asset availability results in a better control over the assets and production process. The use of advanced maintenance practices can

drastically reduce unnecessary and unforeseen maintenance activities and optimize workforce utilization.

RIS combines OEE improvements with reduced maintenance expenses to provide a solid return on assets by:

- Extending the useful life and reducing total life-cycle cost of plant assets
- Increasing plant asset availability and performance while reducing maintenance cost
- Mitigating downtime, risks and consequences
- Reducing time to achieve operational results
- Converting data to decision-making information for continuous improvement
- Evaluating the financial impact of maintenance

## Reliability

duction performance metrics and sets a baseline for improvement targets. The performance of most companies falls well short of this “world class” level, presenting considerable potential for improvement. OEE is thus the main reference KPI<sup>1)</sup>.

The loss-opportunity assessment is built upon the findings of the plant-performance benchmark and reflects the targeted business value of this performance gap. The basics for deploying the asset optimization strategy are technology, maintenance, change-management processes, and continuous improvement programs.

### Phase 2: Implementation

The technology as well as change-management processes are driven by findings of the criticality analysis, benchmarking and assessment phase. Both are essential in enabling a culture of reliability in the company.

Horizontal integration of technologies and solutions is a prerequisite in enabling real-time and closed-loop operations. Therefore, ABB’s 800xA platform is the backbone of the technological part of RIS. Its interoperability, the openness to integrate brand-independent solutions, the suite of asset optimization solutions and the extended library of asset monitors creates a scalable platform for the implementation and successful expansion of asset optimization throughout the enterprise.

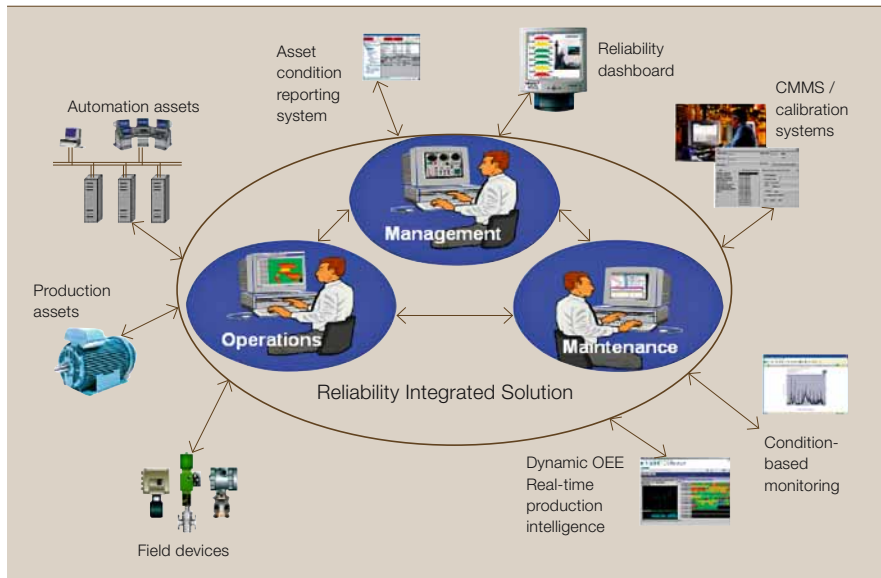
The common 800xA platform takes care of real-time data consolidation and access to historical asset data. Besides being accessible through the standard 800xA workstation, these data are also accessible through a web-based application from ABB: the Reliability Dashboard.

These technologies and solutions cover automation and production assets,

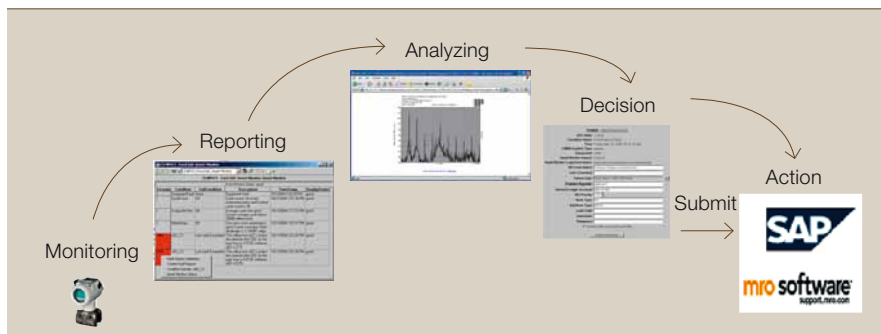
intelligent devices and calibration solutions. They include condition-based monitoring solutions, dynamic KPI-measurement solutions and a Computerized Maintenance Management System (CMMS) **1**. A selection of applications is presented in **Factbox 2**.

Not all asset information may be available in electronic form or based on laboratory results, and hence cannot be integrated in the RIS in an automated way. Asset footprint data, for example oil analysis, thermo-graphical results and environmental data, can be entered in a manual way. Using CMMS connectivity solutions, such as Maximo, SAP and IFS, work-order information is natively linked to the specific asset. The same assets are often named differently in operational and maintenance environments; consequently, to avoid confusion and misinterpretation, all information is linked to the same asset. Work orders are sub-

**1** Conceptual view of RIS (Reliability Integrated Solution)



**2** Avoiding downtime, the information flow from the asset to CMMS



### Footnote

<sup>1)</sup> See also “Making reliability sustainable” on page 54 of this ABB Review Special Report.

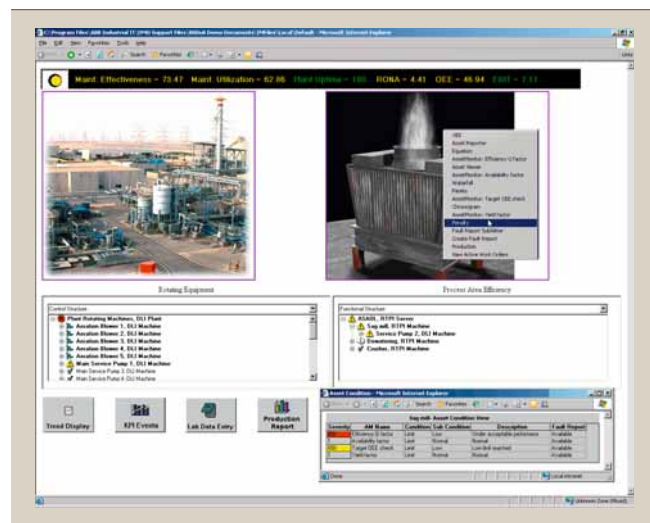
**Factbox 2** A selection of applications

- Real-time asset health evaluation by using standard, device- equipment- or processes-specific asset monitors to trigger maintenance alarms for upcoming issues. These asset monitors rely on continuous condition monitoring. Fault condition reporting with suggested actions and asset data are electronically fed to the CMMS to assure a consistent data flow.
- Dynamic on line OEE with real-time production intelligence will track equipment events, downtime reasons and KPIs such as OEE. Deep root cause analysis (RCA) focuses on the problematic elements responsible for the performance losses.
- Condition-based monitoring applications such as ExpertALERT from DLI Engineering report concise vibration analysis results with severity classification and detailed narrowing-in possibilities for equipment fault analysis.
- Calibration device management solutions such as Asset Master and process control loop monitoring such as Loop Performance Manager (LPM).

mitted, accessed and over-viewed in a consistent way. This horizontal integration creates an automated workflow, from the problem detection by asset monitors over the analysis to actionable decisions, resolving or preventing failure of equipment and avoid upcoming downtime **2**.

As a single point of access, the Reliability Dashboard provides web-based access to real-time and historical asset information such as the maintenance history of KPIs, work-order details and entry (through CMMS), alerts and many other asset-related aspects. This dashboard is available across the site and delivers actionable asset intelligence for operations, maintenance and management staff. For each of these three groups, specific information is available by the ability to “drill down” for in-depth root-cause analysis and decision making. The Reliability Dashboard is not intended as a replacement of the process workstation but as a dedicated maintenance practice oriented, and customizable access point to support advanced maintenance strategies **3**.

**3** The Reliability Dashboard is a dedicated and customizable access point to support advanced maintenance strategies.



### Phase 3 : Continuous improvement

The implemented technology comes to full play when applied in conjunction with a dedicated and advanced continuous maintenance program. This can be equipment-oriented like an equipment performance maintenance program, or a focused support on the equipment asset life cycle. Operational maintenance programs can include, for example, workload balance, implementation of an advanced maintenance program such as Reliability Centered Maintenance<sup>2)</sup> or Total

Productivity Maintenance. Also, specific expertise of equipment may not always be available in the plant<sup>3)</sup>. The Remote Diagnostic Services application uses the RIS technology to remotely support, evaluate and troubleshoot equipment at anything from periodic time intervals to round-the-clock vigilance.

For companies that focus on production as their core business, ABB's Outsourced Performance Services (Full Service) is a viable solution in which ABB takes care of all maintenance operations.

### An advanced solution

The Reliability Integrated Solution includes technology supported by advanced maintenance strategies to fully deploy a successful asset optimization strategy. Equipment availability and production rate improvement is achieved by providing insight into the asset health and the related actions.

Throughout the enterprise, accurate and actionable information on critical assets is made available to the right people at the right time. Operations and maintenance people can thus work together to maximize productivity – basing their decisions on common goals. The target is to provide maximum production output at minimum cost. By combining OEE improvement with reduced maintenance expenses, the primary benefit of RIS is the achievement of a solid and sustainable ROI.

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#### Footnotes

- <sup>2)</sup> See also “Prevention is better than cure” on page 50 of this *ABB Review Special Report*.  
<sup>3)</sup> See also “Remote optimization” on page 13 of this *ABB Review Special Report*.

#### References

- [1] **Wilson, A.**, 2002, *Asset Maintenance Management*, Industrial Press.  
[2] **Reiersen, B.**, April 2006, “Myths and realities of asset optimization,” *Plant Engineering*.

#### Factbox 3 A remote mine in Canada

RIS is applied in a remotely located mine in northern Canada – Vale Inco Labrador Ltd.\* – in combination with ABB's Outsourced Performance Services (Full Services). Due to the harsh environment and remote location, the electrical rotating equipment requires a proactive maintenance approach to guarantee its reliable operation in critical processes.

The RIS application is integrated with the distributed control system and constantly collects data from the prioritized and critical rotating equipment. Vibration data is periodically collected with portable devices supplied by DLI Engineering. The vibration analysis results are then automatically linked with the associated asset and evaluated in the 800xA asset optimization solution. Thermal imaging footprint data are added manually.

#### Footnote

\* See also “A head start to profitability” on page 88 of this *ABB Review Special Report*.

This integrated solution fully supports the condition monitoring of the rotating equipment. In this arctic climate, the rotating equipment calls for special lubrication processes to be run at cyclic intervals and requiring close monitoring. When this data is combined with vibration and thermal imaging, a total hierarchical asset-health overview of this equipment becomes available. Instead of performing traditional cyclic and time-based maintenance, maintenance schedules are planned around the equipment whose chances of failure are found to be most critical. In this way, the use of health information as a consolidated and concise asset leads to an optimized and continuous condition monitoring program. The different levels of actionable intelligence, from asset health KPIs to lubrication-related failures, form the cornerstone of the reliability program for the rotating equipment.