

# EQUIPMENT RELIABILITY INDEX



*PlantView/RIM provides you with the tools to automate the implementation of an ERI at your company. It lets your stakeholders spend less time collecting information and more time identifying and resolving issues that negatively impact your equipment reliability.*

An Equipment Reliability Index (ERI) is a group of performance indicators that enable management to understand the past equipment reliability of a facility and provide indication and insight into expected future equipment reliability. The goal of an ERI is to increase transparency of tasks and actions that influence equipment reliability.

An ERI involves defining key plant process areas that must work effectively—such as work management, maintenance effectiveness and operational challenges—and then identifying indicators that assess and score the effectiveness of each process area. The ERI can be used to measure performance at one facility or across an entire fleet through a common set of indicators.

PlantView® Reliability Index Module (RIM) implements the concept of an Equipment Reliability Index with a complete, user-configurable solution. PlantView/RIM replaces manual spreadsheets and monthly reports with a continuously updating ERI. On a periodic basis, the Reliability Index Module queries various databases to collect data for established indicators. Using predefined calculation rules, each of these indicators is assigned a score and an associated condition. Each indicator contributes towards a possible 100-point total Reliability Index Score based on a configurable weighting criterion. Drill-down capabilities highlight the underlying issues behind the indicators and allow for investigation and insight. Visual displays such as trends, bar charts and spider charts compare performance over time or between cohort facilities and units.

## Benefits

- Establishes uniform and consistent benchmarks/indicators.
- Makes data accessible across the enterprise to a wide variety of users with continuously updated score cards and historical trends.
- Provides information for management to take action before any particular process can negatively affect performance.
- Configurable drill-downs allow management to understand and correct underlying issues instead of only managing the indicator value.
- Updating and reporting the RIM score card creates transparency and reinforces to the organization the importance of reliability measures and how they impact business.
- Compares cohort units and plants to each other.
- Graphical analysis & trending put data into perspective.

## Features

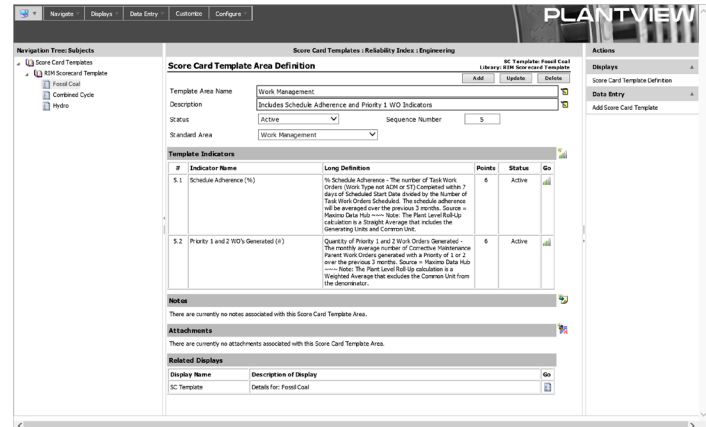
- Stores all information in a centralized, structured Oracle database.
- Data is captured and stored locally for long term trending and historical analysis.
- User configurable indicators and scoring rules.
- Detailed single facility displays; abbreviated multi-facility displays allow for quick comparisons.
- Trends show single indicator performance for score card; single/multi-facility comparisons.
- Spider Charts summarize multiple indicators and allow for multi-facility comparisons.
- Histograms count indicators by evaluated condition, allowing easy identification of problems.
- Templated approach ensures consistency between facilities and speeds implementation.
- Creates and implements different templates for different unit types (e.g. steam vs. combustion turbines) or other classifications (e.g. base load vs. reserve units) to ensure valid comparisons are made.
- Template definitions and scoring criteria are available for review on reported results.

## Design & Configuration Process

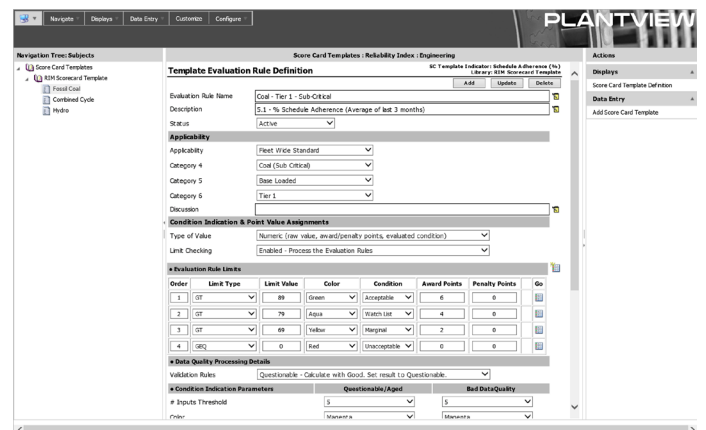
The design process begins with the definition of the RIM indicators that will be used to compare equipment/facilities. The ERI is categorized into two types of indicators, leading or lagging. Leading indicators measure performance in areas that, if managed effectively, will predict and prevent more consequential issues. Lagging indicators measure consequential issues after they've occurred such as critical component failures. For each indicator, it is necessary to identify what will be measured, where the information resides, when the information will be captured and how the score will be evaluated. Values in the RIM grid display support a drill-down feature that is accessed by selecting menu choices from a right-click context menu of listings, counts, trends or URLs. This capability allows the end-user to perform a deep-dive into the data as decisions are made based on values within the grid.

PlantView/RIM configuration is based on the premise that a group of equipment/facilities will implement an identical set of indicators and scor-

ing rules. In RIM terminology, this identical set is called a **Score Card Template**. Each Score Card Template consists of multiple **Areas** such as Plant Operational Challenges, System Health, Maintenance and Work Management for which **Indicators** are defined representing the information that will be collected.



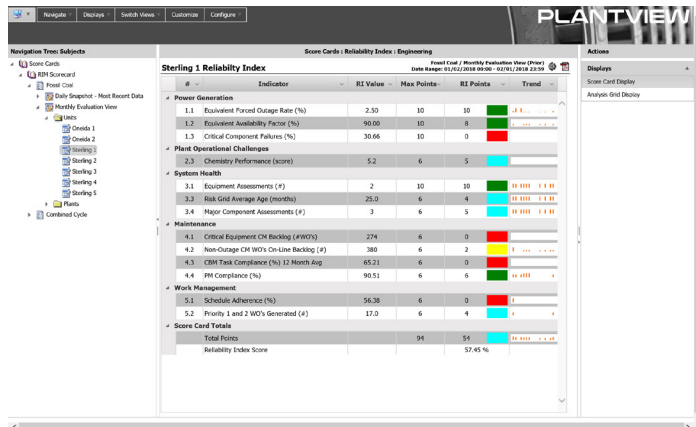
**Evaluation Rules** associated with each indicator define the specific criteria that a value is measured against to determine award points and evaluated condition. Evaluation Rules allow the same Template to be used by equipment/facilities evaluated to different standards. **Evaluation Rule Limits** define the limit checks with their associated color, condition and award points.



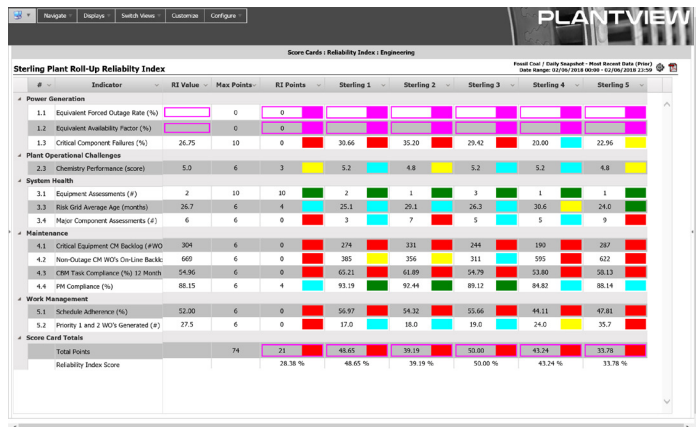
A **Score Card** represents the application of a generic Score Card Template to a specific equipment/facility. Each Score Card consists of multiple Score Card Indicators that link the indicators defined on the Score Card Template with SQL or Calculated Data Points that provide the required information for the specific unit. Score Cards are calculated on a continuous, daily or monthly basis with the results available in several views (displays). It is possible to view the definition of an indicator and its scoring criteria directly on the Score Card form.

## PlantView/RIM in Action

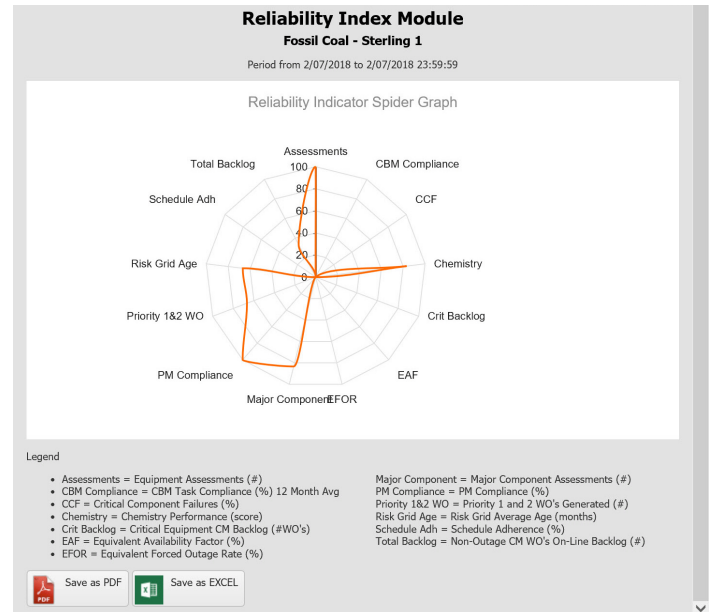
Each key process or program owner is normally assigned responsibility for an indicator(s). These stakeholders access the Score Cards to monitor up-to-date values and scores for their indicators at the facilities for which they are responsible. If an indicator reflects unsatisfactory performance, RIM displays would allow that owner to investigate the "whys" of the negative performance and implement the appropriate corrective actions. The **Score Card View** offers the most detailed view of Reliability Index information. There are five (5) columns of data: value of the indicator, points awarded, maximum number of points available, evaluated color and a sparkline showing the change in evaluated points.



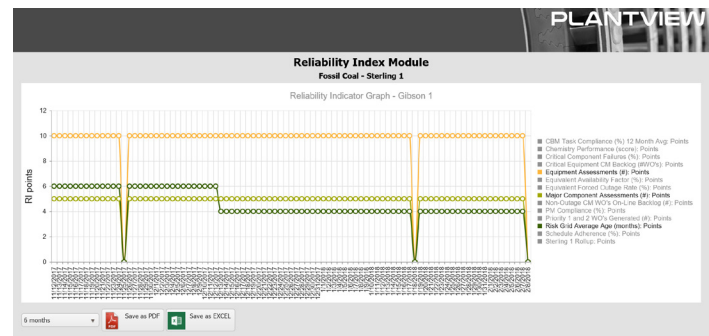
The **Analysis Grid View** offers a condensed view of Reliability Index information within a single cell. The displayed value and background color of a grid cell is configurable. For items implementing the same Score Card Template, adhoc versions of several views are provided to facilitate comparing Reliability Index performance between different selections that would not be possible with the standard hierarchy of equipment/facilities.



In addition to the tabular displays, there are several graphical views. The **Spider Chart** or Radar Chart view is used to compare a selected set of equipment/facilities in graphical format.



A **Pareto Chart** or Histogram view is a bar chart – with a bar for each condition code (Unacceptable, Marginal, Watch List, Acceptable) with the height of the bar being driven by the number of equipment/facilities in each condition. A typical display would be a histogram distribution of all facilities indicating how many have current indicator result condition codes that are red, yellow, cyan and green. The **Trend Chart** view is used to plot a given Score Card result, Indicator Result score or value over a configurable period of time. It is available to display all indicators for a single unit or to display a single indicator across multiple units or facilities. Each of the graphical views supports exporting the underlying data to Excel or the currently displayed view to a PDF document.



## The PlantView® Suite

PlantView Logbooks is a part of a suite of integrated modules supporting the maintenance, operation, training and performance knowledge management processes that help facilities sustain optimal reliability, efficiency and safety. Each module automates information entry, storage, management and reporting for numerous facility functions. The software transforms internal work processes, enabling users to move efficiently from managing information to understanding the implications of that information, and ultimately to action. The PlantView Suite is divided into four disciplines: Maintenance, Operations, Continuous Improvement and Training. It consists of the following modules:

Maintenance	
<b>Predictive Maintenance</b>	Facilitates condition-based maintenance by collecting and storing diagnostic technology results, and facilitating the analysis of multiple technologies into an overall assessment of the equipment.
<b>Maintenance Basis Optimization</b>	By combining rigorous Reliability Centered Maintenance (RCM) analysis with pre-defined templates and a flexible approach to determining criticality, MBO helps develop a sound maintenance basis that balances maintenance tasks and equipment reliability.
<b>Reports Library</b>	Serves as a basic document repository targeted for major equipment maintained on an annual basis. As reports are received from engineering teams, they are assigned a status and uploaded to PlantView.
<b>Engineering Inspections</b>	Standardizes the inspection of components and their associated evaluation criteria. Information is summarized in a grid representing the most recent evaluation that has been performed.
Operations	
<b>Operations Logbooks</b>	Replaces traditional paper logs, text documents, spreadsheets and home-grown portal solutions with a dedicated operator logs system. Assists in tracking and managing any problem from initial diagnosis all the way through remediation.
<b>Risk Assessment</b>	Supports Risk Informed Decision Making by using a 5x5 Risk Matrix that can be viewed across the enterprise to assess and prioritize risks.
<b>Reliability Index Module</b>	Replaces manual spreadsheets and monthly reports with a continuously updating Equipment Reliability Index that can provide a snapshot on a daily, weekly or monthly basis.
<b>System Health</b>	Keeps a running log of issues and concerns for a System or Program. Within a particular instance of a report, the responsible individual identifies issues, snapshots metrics and assigns action items.
Continuous Improvement	
<b>Event Reports</b>	When an event occurs at Site "A," other sites are notified through an event assessment providing a mechanism where the event is reviewed and it is determined if a similar event could happen at their site.
<b>Corrective Actions</b>	Documents how a particular problem/issue is corrected at a site. Once a Corrective Action Report (CAR) is created, it is assigned to a Champion and Team Leader until a solution is determined.
<b>Self-Assessments</b>	An Excellence Grid divides business objectives into categories, elements and sub-elements. Questions are defined with each, and an assessment is completed by multiple users. Management can use the results to focus on areas requiring improvement.
<b>Observations</b>	Observes activities to identify trends in safety, human performance and plant operations to prevent injuries and improve reliability.
Training	
<b>Automated Training Manager</b>	Creates training courses consisting of Lessons and Elements; each element has associated content, questions and skills. Profiles provide trainees with a cross-section of content focused on their job description.

The PlantView® Suite can be installed in your own IT environment or externally hosted. For additional information, please e-mail [info@power-vision.com](mailto:info@power-vision.com).