

RISK MANAGEMENT



Risk management is the identification and assessment of significant risks and the implementation of suitable responses. Risk may be a driver of strategic decisions, a cause of uncertainty in an organization, or intrinsically embedded in the fabric of the organization. Managing risk will help distinguish high-probability, low-consequence outcomes from low-probability, high consequence outcomes and may identify areas where investment is warranted to reduce uncertainty.

Recognizing that the cumulative wisdom provided by experienced personnel is essential for integrating technical and non-technical factors to produce sound decisions, the PlantView Risk module uses a Risk Assessment Grid that can be viewed across the enterprise to capture, assess and prioritize a list of risks. A Risk Assessment Grid presents risks graphically, allowing users to visualize the consequence(s) of an issue and the likely (probability) time frame of their occurrence. When there are limited risks, it supports ranking risks against each other to determine their relative prioritization. When there are too many risks to provide the same level of attention, it supports aggregating them into groups to focus on those requiring urgent remediation. The use of red, yellow, cyan and green colored cells within the Risk Assessment Grid reflects the broad classification of risks into high, moderate, low and very low priority.

Benefits

- *Promotes robust discussion through the process of risk identification, analysis and evaluation.*
 - *Safety, Regulatory, Reliability and Efficiency issues can be ranked by risk level.*
 - *Allows highest risks to be addressed during planned outages.*
 - *Risk Assessments provide input to Capital and O&M budgets.*
- Establishes a dynamic system where the significant risks faced by the organization are easily viewed, communicated and updated across the enterprise.
 - Promotes robust discussion through the process of risk identification, risk analysis and risk evaluation.
 - Provides consistency for prioritizing risks.
 - Assists with business and outage planning.
 - Focuses decision makers on the highest priority risks.
 - Facilitates applying resources to the highest priority risks.
 - Presents complex risk data in a concise visual fashion.
 - Through transparency, can affect the likelihood and consequences of risks materializing.
 - Facilitates better informed strategic decisions.
 - Helps new management understand facility specific risks.

Features

- Stores all information in a centralized, structured Oracle database.
- Provides an easy-to-use template for recording appropriate information about each risk.
- Provides a Risk Assessment Grid to visualize all identified risks.
- Considers multiple categories of consequence and/or estimates of likelihood to provide the most comprehensive picture of risk.
- Assigns risk to consequence categories such as Safety, Regulatory, Reliability, Cost, Efficiency.
- Displays risk issues filtered by category (or other attributes) to identify similar risks across the enterprise.
- Facilitates creating risk issues from multiple PlantView modules: Predictive Maintenance, Event Reporting, Corrective Actions, Engineering Inspections and Operations Logbooks.

Risk In Action

Risk identification establishes the exposure of the organization to risk and uncertainty. In PlantView, the identification process begins at a high level by creating Risk Issues, which include information such as the issue date, issue summary and a detailed description.

This information might be entered directly via the Risk Assessment form or provided via another module in PlantView such as Predictive Maintenance, Event Reports, Corrective Actions, Engineering Inspections or Logbooks.

Once identification has been completed, risk analysis involves a detailed consideration of risk sources, consequences, likelihood, events, scenarios, controls and their effectiveness. A subject matter expert (SME) typically performs this evaluation. The SME's goal is to develop and document not the worst-case scenarios, but the most credible (or expected) scenarios. The SME may assign the risk to one or more consequence categories as an event can have multiple causes and consequences and can affect multiple objectives.

Library: Risk Assessment (Issue #8712)
Last Edited: 05/11/2018 10:04

Risk Assessment Definition

Close Reviewed Add Update Delete

Database Configuration & Standard System Classification

Library: Risk Assessment
Type of Detail: Unit
Detail Selection: Cayuga 5
Utility Standard System: Generator

Issue Details

Issue: CA5 Generator Rotor Rewind
Description:
Comments: 7/2/08: ER Engineering concerned wth the time between inspections and that we do not know the condition of the generator. This could be a very high consequence issue.
Action Plan: 3/5/09: Plant checking with Engineering to determine status. (DW, gla)
03/21/07: Engineering evaluating project (12359) for inclusion in 2009 major outage.
Status Details: 10/21/10: From Engineering, no plans or project at this time due to planned retirement.
Issue Status: Open Issue Date: 03/21/2007
Outage Date: n/a
Date Created/LastEdit: 03/22/2007 / 05/11/2018 Date Closed:

Consequence Category - Reliability

Consequence Category: Reliability Risk Level: High Auto
Status: Open Consequence Rank: 5 (X Axis)
Probability Rank: 3 (Y Axis)
Date Created/LastEdit: 03/22/2007 / 05/11/2018 Date Closed:

Consequence Basis: 3/5/09: If generator fails, unit could be off line 12-14 wks (2000+ hrs). Conseq Rank: 5 (DW, gla) 3/21/07: If generator fails, unit off line for 6 wks for repair. Consequences High.
Probability Basis: 3/5/09: Predict failure could occur within 3 yrs. NEED engineering inputs. Prob Rank: 3 (DW, gla) 10/7/08: Not expected to occur within five years. (LAC, dbd) 3/21/07: Need engineering estimate for RL or EOL.

Consequence Category - Collateral Cost

Consequence Category: Collateral Cost Risk Level: High Auto
Status: Closed Consequence Rank: 5 (X Axis)
Probability Rank: 3 (Y Axis)
Date Created/LastEdit: 09/09/2015 / 06/01/2018 Date Closed: 12/06/2017

Consequence Basis: Consequence basis of Cost is 5 - One vent has been experienced with a hole being burned thru the external of the windbox. Worst case of this happening would be a corner windbox fire, damaging the windbox, drives, all electrical, fuel oil etc in the area.
Probability Basis: Probability Basis of 3. The distortion is already present and means are being taken to reduce the risk (fuel adjustments, coal selection changes). It is not an imminent issue but if not addressed and the changes are ineffective then additional and escalating damage is likely within 3 years. The current damage will most likely create failures within 3 years.

Consequence Category - Reliability

Consequence Category: Reliability Risk Level: Moderate Auto
Status: Closed Consequence Rank: 4 (X Axis)
Probability Rank: 3 (Y Axis)
Date Created/LastEdit: 05/19/2014 / 06/01/2018 Date Closed: 12/06/2017

Consequence Basis: Consequence basis of Reliability is 3 - Potential for significant cracking of the windbox as it attaches to the boiler which could put additional stress on the boiler tube attachments creating tube leaks. Leak repairs are approx 3 days. Cracking could also cause fuel air and aux air dampers to bind thus not allowing proper airflow into the unit and creating combustion issues which can create further distortion or flame impingement upon the tubes.
Probability Basis: Probability Basis of 3. The distortion is already present and means are being taken to reduce the risk (fuel adjustments, coal selection changes). It is not an imminent issue but if not addressed and the changes are ineffective then additional and escalating damage is likely within 3 years. The current damage will most likely create failures within 3 years.

For example, a single Risk Issue could be assigned to Collateral Cost and Reliability Consequence categories -- each with a unique likelihood of occurrence. Every category is tracked through to completion by PlantView and the Risk Issue cannot be closed until all the associated categories have been resolved.

Cayuga 5 Risk Assessment Grid As of May 11, 2018

Probability	<= 1 Years	5		1)CAS HTSH Fireside Corrosion (REL) 2)CAS LTRH Supports Failures (REL)		1)CAS Precip Opacity Issues (REL)	
	<= 2 Years	4		1)CAS - ROFA Fan Bearing Issues (REL) 2)CAS Stack Thimble Degraded (Safety) (SAF)			
	<= 3 Years	3		1)CAS Equipment Cooling Tower 480 Supply (REL)		1)CAS Generator Rewedge (Loose Wedges) (REL) 2)CAS Generator Rotor Rewind (REL)	
	<= 4 Years	2					
	<= 5 Years	1		1)CAS Condenser Tube Leaks (REL) 2)CAS Shelter for 4160 Switchgear (REL)		1)CAS Generator Stator Rewind Needed (REL) 2)CAS: Gen Blower Blades are Bent and Damaged (REL) 3)CAS: Gen Rotor Top Tooth Cracking Indications (REL)	
			1	2	3	4	5
Consequences							
	SAF	Low Safety Concern	*	Moderate Safety Concern	*	High Safety Concern	
	REL	<= 24 Hours	> 24 Hours and <= 72 Hours	> 72 Hours and <= 168 Hours	> 168 Hours and < 3 Weeks	>= 3 Weeks	

Risk Issues can be summarized at various organization levels in either a *summary list* or a *5x5 grid* representing levels of risk (high, moderate, low and very low) in a plot of consequence vs. probability.

PLANTVIEW Risk Assessments - Engineering

Issue / Description / Comments	Issue Date Last Refresh	Issue Status Category Status	CR	PR	Location / # / Project #	Go
CAS Precip Opacity Issues (REL) Comments: REMOVED 6/21/11: Opacity issues may impact recent tests. (LAC, RGT)	06/23/2011 06/29/2012	Open	5	5	Cayuga 5 Issue # 12103 Project # 19095	
CAS Generator Rotor Rewind (REL) Comments: REMOVED 7/2/08: ER Engineering concerned with the time between projections and that we do not have the condition of the generator. This could be a very high consequence issue. (LAC, RGT)	07/02/2007 07/09/2007	Open	5	3	Cayuga 5 Issue # 17123 Project # 19095	
CAS Generator Rotor Rewind (REL) Comments: REMOVED 7/2/08: ER Engineering concerned with the time between projections and that we do not have the condition of the generator. This could be a very high consequence issue. (LAC, RGT)	07/02/2007 07/09/2007	Open	5	3	Cayuga 5 Issue # 17123 Project # 12103	
CAS HTSH Fireside Corrosion (REL) Comments: REMOVED 7/13/09: 2 leaks in OS. Performed HWT tests. Will take add samples / NDE FOS. (LAC, RGT)	07/13/2006 08/08/2006	Open	3	5	Cayuga 5 Issue # 17122 Project # 18330	
CAS LTRH Supports Failures (REL) Comments: REMOVED 8/12/07: For 10 year boiler plan, replace in 2011. Flash erosion found in 2008 inspection. (LAC, RGT)	07/13/2006 07/13/2006	Open	3	5	Cayuga 5 Issue # 17121 Project # 19079	
CAS Stack Thimble Degraded (Safety) (SAF) Comments: REMOVED 8/21/07: Temperature supports made in 2006. Engineering evaluating what to do next. (LAC, RGT)	06/21/2007 06/29/2007	Open	3	4	Cayuga 5 Issue # 19101 Project # 19092	

Both displays contain a comprehensive filter that includes fields such as: Issue Status, Risk Level, Consequence Category, Risk Category Status, Issue Owner, System and multiple date fields.

Filter Specification [Apply]

Issue Status	New Issue (Just Created) Open Closed	Issue Owner	
Risk Level	Moderate	Lead Engineer	
Type of Unit		Budget Type	
Tier Number		System	
Consequence Category	Reliability	Project Type	
Category Status	Not Closed	MBO Library	
Utility Standard System		MBO Category	
All Text Fields		MBO Equipment Type	
Issue ID List		Management Review	
		Outage Date	
Single Date / Adhoc Query (Select DateField)		Consequence Category Dates (Predefined Queries)	
Date Field		New Categories	
Standard Date Ranges		Updated Categories	
Date Range		Closed Categories	

When risk issues are assigned to multiple consequence categories, a "worst case" option displays the overall risk issue based on an equivalent numerical position in the matrix. Other options allow filtering to a single category, or all categories. Since Consequence Categories maintain a status independent of the overall risk issue status, higher priority consequences can be addressed before lower priority consequences. The filter supports reviewing new, updated and closed categories within a specific time frame.

The Search feature allows open/closed risk issues and Consequence Categories to be searched across the enterprise or across similar risks that have already been remedied. All search, listings and grids can be exported to Excel or PDF reports.

PLANTVIEW Search Engineering

Risk Assessment Search Results

Issue / Description / Comments	Issue Status Category Status	CR	PR	Location / # / Project #	Go
CAS Generator Rewedge (Loose Wedges) (REL) Comments: REMOVED 6/21/11: Opacity issues may impact recent tests. (LAC, RGT)	Open	5	3	Cayuga 5 Issue # 12103 Project # 19095	
CAS Generator Rotor Rewind (REL) Comments: REMOVED 7/2/08: ER Engineering concerned with the time between projections and that we do not have the condition of the generator. This could be a very high consequence issue. (LAC, RGT)	Open	5	3	Cayuga 5 Issue # 17123 Project # 12103	
CAS HTSH Fireside Corrosion (REL) Comments: REMOVED 7/13/09: 2 leaks in OS. Performed HWT tests. Will take add samples / NDE FOS. (LAC, RGT)	Open	3	5	Cayuga 5 Issue # 17122 Project # 18330	
CAS LTRH Supports Failures (REL) Comments: REMOVED 8/12/07: For 10 year boiler plan, replace in 2011. Flash erosion found in 2008 inspection. (LAC, RGT)	Open	3	5	Cayuga 5 Issue # 17121 Project # 19079	
CAS LTRH Flash Erosion (REL) Description: Flash erosion found in 2008 inspection. (LAC, RGT)	Open	3	4	Cayuga 5 Issue # 18156 Project # 17755	
CAS Equipment Cooling Tower 480 Supply (REL) Comments: REMOVED 8/21/07: For 10 year boiler plan, replace in 2011. Flash erosion found in 2008 inspection. (LAC, RGT)	Open	3	3	Cayuga 5 Issue # 19256	
CAS Generator Stator Rewind Needed (REL) Comments: REMOVED 7/2/08: ER Engineering concerned with the time between projections and that we do not have the condition of the generator. This could be a very high consequence issue. (LAC, RGT)	Open	5	1	Cayuga 5 Issue # 14032	

Risk Grids are an invaluable tool for organizations seeking a fast, effective and practical risk assessment process. They support the business process of assigning a consequence and probability rank to open issues to determine a prioritized list of equipment concerns. Although subjective decision making will always be part of the risk assessment process, the synergy of combining risk with predictive maintenance and equipment monitoring analysis into a single integrated system will undoubtedly yield benefits of improved reliability.

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	
Predictive Maintenance	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.
Maintenance Basis Optimization	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.
Reports Library	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.
Engineering Inspections	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	
Operations Logbooks	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.
Risk Assessment	Supports Risk Informed Decision Making by using a 5x5 Risk Matrix that can be viewed across the enterprise to assess and prioritize risks.
Reliability Index Module	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.
System Health	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	
Event Reports	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.
Corrective Actions	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.
Self-Assessments	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.
Observations	Observes activities to identify trends in safety, human performance and plant operations to prevent injuries and improve reliability.
Training	
Automated Training Manager	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.