MySiteCondition
ABB Ability™ Life Cycle Assessment for Electrical Systems
Release 1.5
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Managing reliability and risk
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MySiteCondition
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Summary
Effective asset management

For effective asset management and well-founded investment planning, asset owners need to be aware of the following:

- The condition of their assets (aging assets)
- Which components are most likely to fail (risk level)
- How a potential failure would affect (consequences)
- The asset components’ life cycles status
- Applicable modernization measures (retrofit solutions)
- The optimal future maintenance strategy

Effective asset management needs expert support
Maintenance strategies
From “run to failure” to “predictive”

**Advanced maintenance strategies**

**Condition-based**
- Maintenance based on checking and monitoring the components (equipment) and control of the correction actions as a result

**Predictive**
- This includes the evaluation of the consequences of a failure and ensures the right amount of maintenance for the right equipment at the right time

… implementing the right action to the right time
Top failure statistic

Top causes of electrical distribution failures

Before failure happen

- Some power system components age faster, require more maintenance, and are more important to the operational reliability and lifetime than others
- Differentiated know-how about the current asset condition is vital in order to detect in advance the most important failure causes

Shown: aggregated statistics for medium voltage
(Source: Hartford Steam Boiler)
**Business case**

Challenges enabling asset assessment

**Operation issues**
- Aged equipment and infrastructure
- Assets being run at full or above capacity
- Loss of expert knowledge (retired, layoffs, etc.)
- Need to improve system reliability and safety
- Cost to continue time-based maintenance (limited budget)
- Scattered and not leveraged data about assets

**Business objectives**
- Reduce unexpected downtime (cost, damage to reputation)
- Improve reliability and safe working environment
- Focus maintenance resources and repair on the biggest needs
- Move towards less costly condition-based maintenance
- Prioritization of asset replacement (optimum budget allocation)
- Balance between cost down and reliability up (cost vs risk)

ABB offers customers comprehensive asset assessment and a documented decision-making framework
Managing reliability and risk
A matter of condition and importance

1. Risk = Probability x Consequence

2. Probability → Condition
   Consequence → Importance

3. Risk = Condition x Importance

The calculated risk for each asset essentially depends on its assessed condition and importance.
The asset risk chart
Importance (level)/Condition (index)

Visualization of the current status

- The importance/condition chart gives an overview of the current condition of the asset, linked to its importance:
  - The *condition index* is representing the health condition of the asset and its components
  - The *importance level* of an consider its product life cycle status and system and functional criticality within the substation
- It gives a first idea about where to invest the operational budget in order to reduce the risk of failure

Risk chart for each substation on the plant or for one substation with the switchgear, breaker, switches and relays installed

Categorization and prioritization of actions

<table>
<thead>
<tr>
<th>Basic actions</th>
<th>Preventive actions</th>
<th>Urgent actions</th>
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</thead>
</table>

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| Slide 8
Overview
What can MySiteCondition offer?

**On-site visit**
ABB staff’s visit to carry out a thorough asset assessment

- Basic (purely visual*) or full (inspection, test) asset assessment based on ABB know-how and experience
- Process supported by using a tablet/smartphone App applicable for a wide range of assets (age, type, brand)
- Analysis of condition and importance, operational history, and availability of spares and maintenance competences

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**Decision-making framework**
A documented and transparent decision-making framework

- Detailed risk charts visualizing the asset risk profile for each substation and their components
- Technical report, including pictures, to directly target the required needs discovered
- Detailed recommendations for further study or action, along with chronological priorities

*) no technician needed, can be performed e.g. by an accomplished salesman

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Optimal allocation of budget (maintenance, retrofit or replacement) to reduce risk and consequence of failure
### Customer benefits

MySiteCondition

<table>
<thead>
<tr>
<th>Condition status</th>
<th>Risk reduction</th>
<th>Budget allocation</th>
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<tbody>
<tr>
<td>• Objective up-to-date overview about the substation and single component condition</td>
<td>• Knowledge about risk reduction opportunities as well as recommended mitigation actions</td>
<td>• Operational budget only used where asset reliability or safety might be endangered in the future</td>
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</tbody>
</table>

**Optimal allocation of budget (maintenance, retrofit or replacement) to reduce risk and consequence of failure**
Application areas

MySiteCondition

**Assets**

MySiteCondition methodology can be used for (independent from age, type and brand):

- Medium voltage equipment
- Low voltage equipment

MySiteCondition addresses reliability in a systematic way by analyzing:

- Operational risk of the equipment
- Importance of the equipment
- Product life cycle subjects
- Asset history (including operator interview)
## The process

Asset assessment divided into five major steps

<table>
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<tr>
<th>Specify</th>
<th>Classify</th>
<th>Analyze</th>
<th>Report</th>
<th>Action</th>
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<td>Prepare</td>
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<td>- Evaluation of importance of asset in network</td>
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<td>On-Site</td>
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<tr>
<td>- Data collection</td>
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<td>- Reliability-Risk assessment</td>
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<td>Post-Site</td>
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<td>- Risk mitigation proposal</td>
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<tr>
<td>On-Site</td>
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<td>- Development of a remediation plan</td>
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Keep your asset running – Operational stability
Data collection

Flexible and handy tool based on a IOS tablet/smartphone App

Step-by-step solution

More than 100 criteria* based on
- Nameplate data (e.g. manufacturer and age)
- Observation (e.g. service interval and cleanliness)
- Inspection (e.g. shutter operation and grounding interlock)
- Test (e.g. infrared scan result and insulation resistance)

Most inputs with pre-defined list of answers
- Example: “Shutter observation”
  - checked and extreme wear or broken
  - checked and visible wear and degradation,
  - checked and good condition
  - not observed

*) Series of criteria depending on the preliminary selection basic or full assessment
The documented and transparent decision-making framework

**Increase reliability, reduce risk, improve safety**

According to customer expectation the report can include the following:

- Charts with risk exposure and mitigation effect
- Photographs, pictures, tables and diagrams
- Cost-benefit analyses of potential mitigation actions
- Product Life Cycle support statements
- Proposal for maintenance cost

- Appropriate allocation of available funds
- Targeting the critical points and required needs
- Under prioritization aspects and customer requirements
- Focusing on life extension topics (spares, retrofit)
- Choosing future oriented maintenance strategy

Remark: State-of-the-art IT technologies allows easy traceability of previous assessments and support periodical re-assessment
## Summary

MySiteCondition

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Substations are key elements in power system and consequently, the financial impacts of any failure or outage can easily exceed their asset value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution</td>
<td>MySiteCondition offers a composition of the current asset condition and the possibility to quantify and manage existing and upcoming risks</td>
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<tr>
<td>Analysis</td>
<td>Knowing and improving the condition of the equipment is key factor in reducing the likelihood of failures, damage and injury</td>
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<tr>
<td>Reward</td>
<td>Support for the most appropriate business decisions related to the allocation of operational maintenance and investment budget (prioritization)</td>
</tr>
</tbody>
</table>

*Improve your asset performance based on ABB Service equipment know-how*