ABB RelCare™
Lifecycle service partnership for optimizing asset / system performance
1 Asset management strategies
Integral maintenance management service solution

2 Case study
Benefits of implementing reliability centered maintenance

3 ABB RelCare™
Maximizing system reliability and safeguarding your investment

4 Conclusion
Asset management challenges

How can we solve the challenge of reliability and technical performance for an optimized cost?
RelCare™ responses to asset management challenges
Integrated maintenance management service solution

1. System reliability and financial modeling
   Condition and importance of assets

2. Maintenance policies
   What maintenance actions to be executed under which condition

3. Planning optimization
   Scheduling and budget planning

4. Execution
   Minimize quality issues by enabling repeatability of execution process
Different maintenance strategies comparison

**Time-based maintenance (TBM)**
Planning according to time intervals recommended by the OEM

**Condition-based maintenance (CBM)**
Planning according to the condition/health of the assets

**Reliability-centred maintenance (RCM)**
Planning according to the risk of the assets

Targeted maintenance based on the equipment risk helps to reduce costs and increase reliability.
**ABB RelCare™**

Using digital Failure Modes and Effects Analysis to create risk matrix

- **Protection and control lag** (fraction of a second)
- **Mean time to switch** (fraction of an hour)
- **Mean time to repair** (couple of hours to ….)

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**Failure**

- Clear failure
- Isolate failure

**System restored**

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**Surrounding CBs tripped**

**Affected bus de-energized**

**Surrounding CBs closed**

**Failed CB isolated**

**Affected bus re-energized**

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**Expected Energy Not Supplied**

<table>
<thead>
<tr>
<th>MTTS</th>
<th>MTTR</th>
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<tbody>
<tr>
<td>L1</td>
<td>98 MWh</td>
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*FMEA: Failure Modes and Effects Analysis, embedded in the ABB RelCare™ software deployed within a Service Agreement.*

CB: Circuit Breaker
Benefits of implementing reliability centered maintenance

Case study

MAXIMIZING SYSTEM RELIABILITY AND SAFEGUARDING YOUR INVESTMENT

Conclusion
Reliability centered maintenance
Business case study

5 Substations of a customer were considered for the study

Substation 1
37 years in service

Substation 2
21 years in service

Substation 3
24 years in service

Substation 4
21 years in service

Substation 5
16 years in service
Reliability centered maintenance

Business case study
Reliability centered maintenance

Business case study – enhanced reliability and reduced costs

Well designed maintenance policies and systematic implementation of maintenance plan lead to more reliable power delivery and significant operational savings.

1. Increased focus on executing the right maintenance actions allows early detection of failures.
2. Dynamic risk monitoring enables proactive planning of corrective actions and reduction of costly emergency repairs.
3. Prevent failures related to poorly executed maintenance by following digitalised step-by-step execution procedures (SWMS*).
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What is ABB RelCare™

- A digital service agreement
- A service providing Asset Managers and O&M managers a holistic view of their Substations Operation & Maintenance, from planning to execution
- Connecting Asset managers with assets and O&M teams through digitized workflows enabling to continuously improve system performance and reduce asset risks
- Offering opportunity to significantly optimize cost, quality, safety (from day one) over the entire lifecycle
Substations maintenance management is an optimization exercise considering target system reliability performance on the one hand and financial investment on the other hand.
## ABB RelCare™

A digital service that completely transforms the customer journey

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>RISK BASED decision making for improved substation RELIABILITY and PERFORMANCE</strong></td>
<td>The long awaited criterion for all asset management decisions can now be evaluated by a real-time software.</td>
</tr>
<tr>
<td><strong>Much EASIER OUTAGE and maintenance planning</strong></td>
<td>Just assign all proposed maintenance actions to outage windows, fully informed on their impact on substation performance.</td>
</tr>
<tr>
<td><strong>PLUG AND PLAY: Relcare Box</strong></td>
<td>Specific maintenance management module for substations with visualization of Single Line Diagram, preloaded policies, safe work methods and probabilities.</td>
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<tr>
<td><strong>Quantum leap in QUALITY and SAFETY</strong></td>
<td>By performing maintenance when needed with up-to-date, continuously improved procedures, complete preparation and grouping of work orders.</td>
</tr>
<tr>
<td><strong>REAL TIME MAINTENANCE DASHBOARDS</strong></td>
<td>Asset and maintenance managers can follow the evolution of asset value with immediate traceable feedback from executed maintenance and sensor data.</td>
</tr>
<tr>
<td><strong>ELECTRONIC DOCUMENT management</strong></td>
<td>The nightmare of maintaining paper documents and the associated risks and cost are over.</td>
</tr>
<tr>
<td><strong>PREDICTIVE maintenance ready</strong></td>
<td>Prepared to link operational data, inspections and sensors to condition of assets and probability of failure.</td>
</tr>
<tr>
<td><strong>REDUCED BUT RELEVANT INVENTORY</strong></td>
<td>Optimal inventory by probabilistic risk assessment and link to needed spare parts; fleet management.</td>
</tr>
<tr>
<td><strong>SMARTER DECISIONS for future investments</strong></td>
<td>Based on substation performance and total cost data, decide between maintenance, upgrade and replacement.</td>
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**ABB RelCare™**
Digitally enabled service level agreement for optimized systems performance

**Expert support**
ABB know-how available to you when you need it most with tailor made engineering solutions

**Onsite execution**
Periodical inspections, preventive maintenance, diagnostics, and corrective maintenance

**Asset management**
Holistic dashboards on S/S risks and performance from planning to execution, digitized workflows connecting asset managers with operational teams

**Spare parts**
Support to choose the right parts and sourcing and management of strategic spares and components

**Operations service**
Service person on duty for onsite or remote monitoring and operation

**Maintenance engineering**
Smart management system and process digitalization to optimize maintenance operations and costs

**ABB RelCare™**
Optimal substation performance over the lifecycle
1. Asset management strategies
   Integral maintenance management service solution

2. Case study
   Benefits of implementing reliability centered maintenance

3. ABB RelCare™
   Maximizing system reliability and safeguarding your investment

4. Conclusion
Conclusion
A partnership for success

Our competence
Getting the best out of substation assets

ABB is the ideal partner to provide certainty on substation assets and to ensure delivering peak performance and reliability – extending the lifetime of the equipment by applying the right maintenance strategy.

Our expertise, breadth of services, and commitment to operational excellence is our aim with all these coming from our vast experience and tradition as equipment manufacturer and maintainer.

We allow ourselves to ensure to meet the changing needs of the power grids of today and the future.

“There is far more to ABB substations service than in keeping assets in perfect working order. We are dedicated to helping customers get the best return on their investment by ensuring that their substations are future-proofed against the changing needs of power grids.”
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