ABB High Voltage Service can perform fleet assessments and risk profiling to benchmark asset health and prioritize maintenance and replacement strategies.

**Fleet Assessment Benefits**
- Work within the scope of limited budgets by prioritizing equipment maintenance, upgrades, and decommissioning
- Improve system reliability, availability and predictability
- Records from assessment provide scorecard / benchmark for improvement
- Allocate funds to the most cost-effective resources / services
- Reduce lost revenue by preventing outages
- Reduce forced power outages – frequency and duration
- Extend equipment life of current switchgear fleet
- Reduce reliability concerns with aging equipment
- Improve safety of fleet and personnel work environment from switchgear and component failure
- Determine short and long term strategies to maximize fleet performance & reliability
- Reduce short-term cash outlay by as much as 50%

**Challenges of aging equipment**
- Aging infrastructure increases reliability and safety concerns
- Average age of switchgear estimated at 35-40 years
- Technicians have less experience as older workers retire, making maintenance more dangerous
- Tight budgets require utilities and industry to delay the replacement of older equipment
- Obsolete equipment drives up costs

**Why analyze high voltage equipment?**
- Fleet Assessments analyze the health of your fleet of HV equipment
- Various studies can be provided to meet any budget
- Assessments take into account things such as age, support, maintenance and known issues
- Fleet assessments help to prioritize maintenance scopes and increase system reliability
- Applies budget throughout equipment with greatest impact
- ABB offers basic, conditional assessments of installed base lists to determine fleet actions

![Typical ABB Fleet Assessment graphic showing where action is required. Each dot represents a specific asset.](image)

<table>
<thead>
<tr>
<th>Color</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Urgent actions needed</td>
</tr>
<tr>
<td>Yellow</td>
<td>Preventative action needed</td>
</tr>
<tr>
<td>Green</td>
<td>Normal maintenance action needed</td>
</tr>
</tbody>
</table>
**Asset lifecycle planning**

<table>
<thead>
<tr>
<th>Asset assessment</th>
<th>Risk mitigation recommendations</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prioritize drivers</td>
<td>Refurbish</td>
<td>Increase life expectancy of existing equipment</td>
</tr>
<tr>
<td>system reliability</td>
<td>Repair</td>
<td>Improve personnel safety</td>
</tr>
<tr>
<td>safety issues</td>
<td>Upgrade</td>
<td>Increase reliability</td>
</tr>
<tr>
<td>O&amp;M budget issues, etc.</td>
<td>Replace</td>
<td>Decrease costs</td>
</tr>
<tr>
<td>Prioritize objectives</td>
<td>Monitor &amp; maintain</td>
<td></td>
</tr>
<tr>
<td>cost reduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>safety improvements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>life extension requirements</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ABB’s comprehensive fleet assessment program utilizes the most technologically advanced diagnostic tools, a defined decision making process of analyzing fleet assets, and services to support multiple options for retaining, rebuilding, or removing assets.

With early intervention, maximum output is achieved at the lowest cost.

When you need a Fleet Assessment

- No maintenance in substation for several years
- Irregular maintenance schedule
- Uncertain of equipment quality in substation
- Utility changed ownership – equipment benchmarking necessary
- Recent/future inventory reduction program in place
- Significant population of legacy switchgear in fleet
- The plant has to be upgraded in order to comply with current standards
- Number of failures exceeds manufacturer’s limit
- Reliable long-term spare part supply is unsure
- Outage rates need to be minimized
- Available fault currents increase
- Load has increased
- Voltage requirements increase
- Tribal knowledge retiring or new crew from merger/acquisition/divulsion of company
- History of above average warranty claims
- Need to uprate HV equipment
- Present maintenance activities are too costly
- Utility experiencing high SF₆ emissions
- Need to ensure equipment is operating within set parameters

Three Phases of Assessments

1. **Data Gathering**
   - Equipment application
   - Operation duty and environment
   - Maintenance history
   - Equipment condition
   - Individual component data
   - History of faults or significant events
   - Existing studies

2. **Condition Assessment**
   - Evaluate manufacturer’s criteria and needs of individual switchgear
   - Assign criticality ratings to each switchgear

3. **Risk Mitigation Plan**
   - Discuss results and recommend solutions & guidelines

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