Typical alarm management issues

- Too many alarms overload operators who then tend to ignore them
- Nuisance alarms are irritating and reduce operator confidence in the alarm system
- Too many standing alarms interfere with the operator’s ability to identify the most important alarms
- Alarm management is not considered important until there is an incident
- Alarm system performance is not monitored or reported
- A small number of signals generate a large percentage of all alarms
- Control room environment, layout, sound and human-machine interface are not configured for effective alarm management

Solution

The ABB Alarm Management Fingerprint identifies and documents opportunities for alarm management improvement. Benchmarking establishes current alarm handling system effectiveness and provides a basis for evaluating and identifying improvement opportunities. The resulting report provides detailed recommendations.

Benefits of improved alarm management

Enhanced process safety and reliability due to:
- Better defined configuration and implementation standards
- Better procedures to control alarm system changes
- Thorough analysis of proposed alarm changes
- Regular review of the consequences of proposed changes
- Documentation of alarm changes

Typically, a small number of devices generate a large percentage of the alarms.

<table>
<thead>
<tr>
<th>Device</th>
<th>Number of alarms</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>600</td>
</tr>
<tr>
<td>2</td>
<td>500</td>
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<tr>
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<td>9</td>
<td>100</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
</tr>
</tbody>
</table>

Improved operation and maintenance efficiency due to:
- Reduced standing and nuisance alarms
- Alarms having clearer purpose, priority and response actions
- Better documented alarm designs
- Assigned importance and hazard levels that direct attention to high-priority alarms

Better plant management due to:
- Alarm reports and alarm system trends generated automatically for plant operators, engineers, and management
- A foundation for continuous improvement is established

Diagnose

The ABB Alarm Management Fingerprint benchmarks current performance levels and provides a basis for evaluating and identifying improvement opportunities.

The ABB Alarm Management Fingerprint includes:
- Reviewing documented procedures and current practices
- Conducting structured interviews with key personnel, including operators, supervisors, engineers and production management
- Examining the control room environment to determine the impact of layout, use of sound, and human-machine interfaces (HMI)
- Conducting a systematic analysis of alarm data and compare alarm statistics with internationally accepted alarm procedures (EEMUA 191 guidelines and ISA 18.2 standards*)
ABB provides executive and technical reports of findings and recommendations that result from the Fingerprint.

The Executive Report highlights current best practices, and summarizes the benchmark findings, the maturity of alarm handling practices, procedures and culture.

The Technical Report provides site data and analysis of alarm rates, frequency, priorities, and operator response times, with comparisons to ISA 18.2 standards and EEMUA 191 guidelines. The report also compares the management of the alarm system relative to best practices.

Customers select which improvements they wish to implement, and work with ABB on how to do this. Bundling corrective implementation services with the Fingerprint provides the best value and most efficient path to resolving alarm management issues. Implementation services can be delivered entirely by ABB, in conjunction with site personnel, or under the guidance of an ABB project manager.

**Sustain performance**

Ongoing monitoring ensures that alarm performance does not degrade over time, and improves alarm performance as new techniques and technologies are developed and as corrective actions are incorporated.

ABB provides periodic diagnostic monitoring of alarm performance through additional Alarm Management Fingerprints, and can provide standard monitoring through suitably equipped control systems and other software tools to sustain alarm performance.

The key to sustaining benefits derived in implementation is to ensure that the correct tools are accessible to the people who maintain and manage the alarm system.

**Why ABB’s solution is best**

With extensive experience in providing alarm management services, ABB understands alarm system performance, alarm statistics, and the management of alarms.

Aspects of your current system design, documentation, configuration, and management are evaluated relative to ISA 18.2 standards and EEMUA 191 guidelines*, resulting in solutions for operator alarm overload, removal of nuisance alarms, and defined and prioritized alarms.

**Service availability**

The Alarm Management Fingerprint is available for ABB process automation and for non-ABB process automation, when an appropriate log of alarm data is available. Alarm management support and development for new process automation is also available.

Implement

An Improvement Plan provides recommendations for corrective actions, prioritized by severity and the effort required to effectively deliver the needed changes.

Recommendations typically address:

- Developing and implementing a logical alarm philosophy
- Performing an alarm rationalization review to define alarm actions, prioritize alarms, and reduce number of alarms
- Tuning alarm limits and dead bands to reduce nuisance alarms
- Configuring conditional alarm logic
- Training site personnel on alarm management
- Addressing alarm management ergonomics
- Developing functional reports on alarm system performance
Alarm Management Fingerprint
Identify opportunities for alarm management improvement

Service delivery of Alarm Management Fingerprint
An on-site evaluation is completed in two to three days, followed by off-site analysis and reporting.

Annual Fingerprints are recommended to sustain improvements.

Examples of Successes
– ABB helped an offshore oil producer avoid shutdowns through alarm rationalization and management. This producer has recorded multiple savings of as much as $500,000 through the avoidance of lost production. Nearly 50,000 points were reviewed and the alarm system was optimized with EEMUA guidelines.
– A liquefied natural gas (LNG) supplier gained more than $2 million annually in extra production as a result of alarm management practices delivered by ABB. Alarm rates were cut from 390 to 2 alarms per 10 minute period. So that knowledge would not be lost after the service delivery, the LNG supplier’s personnel were trained in alarm management practices, and strategy documentation was provided to management.

*EEMUA 191 guidelines are internationally recognized alarm management procedures compiled and published by the Engineering Equipment & Materials Users’ Association (EEMUA). ISA 18.2 is an international standard providing requirements for alarm management and alarm systems.

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