

Alarm Management Optimization

Ensure plant safety and improve operator efficiency



Issues we typically see:

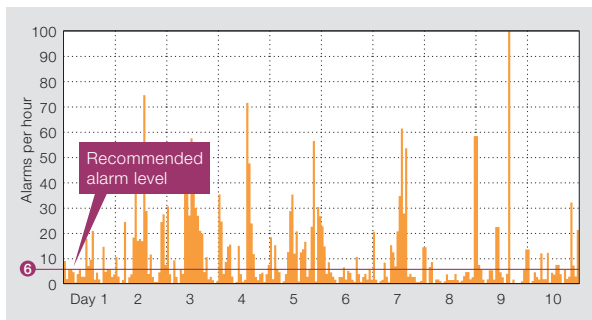
- Long lists of standing alarms obscure important alarms
- Alarms not effectively prioritized
- Nuisance alarms move in and out, reduce operator confidence, and are overlooked
- Alarm management policies and procedures are not documented
- Control room environment, layout, sound and HMI are not configured for effective alarm management

ABB's operator-focused Alarm Management Optimization service is aligned with appropriate industry standards and guidelines. All aspects of alarm management are examined, including involved technologies, operational processes, and control room environment.

Diagnostic step

In order to establish a baseline for evaluation, the diagnostic begins with a benchmark of current performance levels. During this process, current practices and procedures are reviewed, and key personnel are interviewed to understand site-specific alarm requirements and cause and effect of alarms.

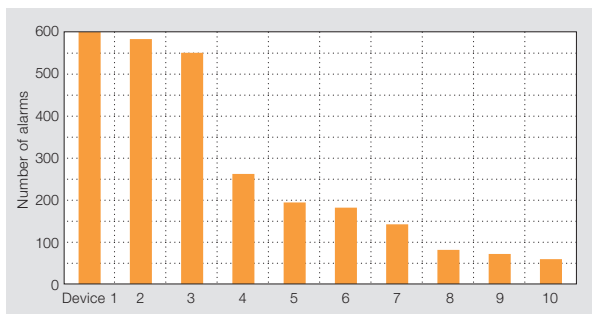
Frequently, the actual number of alarms per hour is far greater than the EEMUA recommended alarm rate of 6 per hour.



The impact of elements such as layout, sound, and Human-Machine Interface are also examined to determine if current "human factor" conditions are optimal and effectively prompt appropriate operator response activity.

After completion of the alarm data analysis, results are compared against the EEMUA 191 industry standards guideline for alarm management. A prioritized improvement plan is then developed to meet guidelines, optimize the alarm environment, and improve operator response.

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



Diagnostic reporting

At the conclusion of the evaluation period, the results of the alarm management diagnosis are described in a comprehensive report that also includes recommendations and an improvement plan.

The report provides data that illustrates current alarm

system management relative to best practices, including analysis of alarm rates, frequency, priorities, and operator response times. It also highlights current best practices and summarized EEMUA 191 benchmark findings, maturity of site alarm, handling practices, procedures, and culture.

Improvement Plan

The Improvement Plan provides recommendations for corrective actions, prioritized by severity and effort required to achieve solutions. These may include the following:

- Develop and implement a logical alarm system management strategy
- Perform an alarm rationalization review to define alarm actions, prioritize alarms, and reduce number of alarms
- Tune alarm limits and dead bands to reduce nuisance alarms
- Configure conditional alarm logic
- Train site personnel on alarm management
- Address alarm management ergonomics
- Develop functional alarm system performance reports

Bundling diagnostic and corrective implementation services 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.

Once the diagnostic services are complete, the implementation services will be determined and provided as soon as arrangements and potential site visits are scheduled.

Implementation

Once improvement recommendations have been defined, approved and scheduled, steps to improve process safety and reliability, while creating a foundation for continuous alarm management improvement, can begin.

Documented alarm configuration and implementation standards clarify alarm priorities and purpose by reducing standing and nuisance alarms to improve operator efficiency and plant safety and reliability. Specific alarm importance and hazard levels are assigned, so immediate attention can be given to high priority alarms, with clearly defined response actions.

Alarm management documentation is made available for operational and maintenance personnel. Once optimized and documented, alarms can be maintained utilizing a thorough management process: change analysis, consequence review, approval, documentation. This provides a structured system through which to track changes that may be implemented, with documentation and traceability.

Alarm reports and alarm system trends can be generated automatically for plant operators, engineers, and management.

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's design, documentation, configuration, and management are evaluated relative to EEMUA 191 guidelines, resulting in solutions for operator alarm overload, removal of nuisance alarms, and defined and prioritized alarms.

Service Availability

Alarm Management Optimization is available for ABB control systems and for non-ABB systems when an appropriate log of alarm data is available. Alarm management support and development for new systems is also available.

References

- **Offshore oil producer:** 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 brought into compliance with EEMUA guidelines.
- **LNG supplier:** 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 minutes 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.