Alarm Management Training Course: Floods, Priority Setting and AI-Assisted Triage

26 – 30 April 2027
Tokyo

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Programme Summary

Alarm management is the subject of this one-week training course for control room supervisors, operations managers and process control leads, ending in an alarm improvement plan for one plant unit. Many plants carry thousands of alarms that operators cannot act on, so important signals are lost in floods of noise. The programme moves from the alarm lifecycle to flood analysis, priority setting, rationalisation, AI-assisted triage and operator response. Mars Training Centre UK delivers this programme on alarm management to mixed-organisation cohorts.

The Business Case

Refineries, gas plants, petrochemical sites and power facilities depend on operators who notice the right alarm at the right time. When alarm systems are cluttered, response slows and warnings are buried. Leaders who measure alarm performance and approve changes through a clear process can reduce this exposure without removing the protection operators need.

- Operator Workload: Falls when nuisance and repeating alarms are removed or redesigned.
- Response Time: Improves when priorities direct attention to the alarms that matter first.
- Incident Exposure: Declines when alarm changes are reviewed, approved and tracked.

Principles and Evidence Base

- IEC 62682: Sets the lifecycle for managing alarm systems in the process industries, applied in Sessions 1 and 3 to philosophy, rationalisation and change control.
- ISA-18.2: The industry standard from which IEC 62682 is derived, applied in Session 2 to performance indicators and flood definitions.
- Pareto Analysis: Ranks causes by frequency, applied in Session 2 to find the few alarms that produce most of the load.
- Human Factors Principles: Describe operator attention and workload limits, applied in Session 4 to triage rules and response design.

Intended Participants

- Control room supervisors who own operator workload and shift handover.
- Operations managers who accept alarm changes and set performance targets.
- Process control and automation leads who configure and maintain alarm settings.
- Safety and reliability leaders who review incidents involving missed or late alarms.

Typical settings include refining, gas processing, petrochemicals and power generation.

Learning Outcomes

1. Participants will be able to evaluate an alarm system against lifecycle stages and performance indicators.
2. Participants will be able to diagnose the causes of alarm floods, nuisance alarms and standing alarms.
3. Participants will be able to prioritise alarms by consequence and the time an operator has to respond.
4. Participants will be able to construct a rationalisation record that justifies keeping, changing or removing each alarm.
5. Participants will be able to design human-approved AI triage rules that support, not replace, operator judgement.
6. Participants will be able to justify an alarm improvement plan to a plant leadership team.

Programme Structure

Day 1: Alarm Management Foundations and Lifecycle

What must an alarm be, and who owns each stage of its life?

- Alarm System Lifecycle Map
- Alarm Philosophy Document Outline
- Alarm Definition Test
- Roles and Responsibilities Matrix
- Alarm Change Control Form

Day 2: Alarm Floods and Performance Analysis

Which alarms create the load, and how is it measured?

- Alarm Rate per Operator Chart
- Flood Event Identification Log
- Pareto Chart of Frequent Alarms
- Standing and Stale Alarm Review
- Alarm Performance Indicator Report

Day 3: Priority Setting and Rationalisation

Which alarms deserve an operator's attention, and in what order?

- Consequence and Response Time Priority Grid
- Alarm Rationalisation Worksheet
- Setpoint and Delay Review Sheet
- Suppression Rules and Approval Record
- Alarm Master Database Entry

Day 4: AI-Assisted Triage and Operator Response

How can analytics help operators without hiding a real alarm?

- Alarm Clustering and Correlation Analysis
- Flood Pattern Detection Rules
- Triage Suggestion Review Protocol
- Operator Response Guide Template
- Human Approval and Override Rules

Day 5: Alarm Improvement Plan for One Plant Unit

Do the earlier tools join into a plan that plant leaders can approve?

- Applying the Session 2 Performance Indicator Report
- Testing the Session 3 Priority Grid
- Checking the Session 3 Rationalisation Worksheet
- Reviewing the Session 4 Triage Review Protocol
- Completing the Alarm Improvement Plan

Methodology

The programme uses a data workshop built on a prepared alarm log for one process unit, with alarm settings, operator actions and an incident summary. Participants rank alarms, rationalise a sample and defend their plan to peers acting as the plant leadership team.

- Suggested activity: Ranking the twenty most frequent alarms and naming the cause of each.
- Suggested activity: Assigning priorities to a set of alarms using consequence and response time.
- Suggested activity: Reviewing an AI triage suggestion and recording when the operator must override it.

Capstone Output

Each participant completes an alarm improvement plan for one plant unit. It holds a performance baseline, a ranked list of problem alarms, priority and rationalisation decisions, triage and response rules with human approval points, and a change control route. At work it guides the first improvement cycle and briefs plant leaders.

Frequently Asked Questions

Is an alarm management course suitable for leaders who do not configure control systems themselves?

Yes. Alarm management is taught through prepared logs and templates. The programme assumes responsibility for operators, plant performance or control systems, but no earlier experience of alarm rationalisation or data analysis.

Which standards and methods does alarm management rest on in this programme?

Alarm management rests on IEC 62682 and ISA-18.2 for the lifecycle, Pareto analysis for finding frequent alarms, and human factors principles for operator workload and response design.

How is the plan from alarm management used at work?

You use the alarm improvement plan to set performance targets, agree priorities with operations, approve alarm changes through a controlled route and track results unit by unit.

How does alarm management differ from a programme on process safety management?

Alarm management concentrates on alarm performance, priorities, rationalisation and operator response, while a process safety management programme concentrates on hazard studies, safeguards, audits and wider safety systems.