Workplace Hazard Detection with AI Training Course: Site Vision, Near-Miss Data and Controls

19 – 23 April 2027
Rome

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Ref: 880_40395 **Date:** 19 – 23 April 2027 **Location:** Rome **Fees:** 5500 GBP

Programme Summary

Workplace hazard detection with AI, covering site vision, near-miss data and the controls that follow, is the subject of this one-week training course for safety, health and environment leaders, ending in a hazard detection plan for one operating site. Hazards are often visible in cameras, logs and incident text long before an injury, yet teams struggle to judge which alerts deserve action. The programme moves from hazard basics to data, vision, prediction, oversight and control choice, using prepared site records. Mars Training Centre UK delivers this programme on workplace hazard detection to mixed-organisation cohorts.

The Business Case

Construction firms, plants, warehouses and utilities generate large volumes of observations, inspections and near-miss reports that no team can read in full. Leaders who know where AI tools help find hazards, how to test their alerts and who stays accountable can direct scarce safety effort to the exposures that matter, and can show a board how they decided.

- Recordable Incidents: Fall when hazards found by tools and reports are matched to controls that are checked.
- Alert Workload: Eases when false alarms are measured and thresholds are agreed with the people who respond.
- Risk Exposure: Becomes clearer when leading indicators are tracked beside incident counts.

Principles and Evidence Base

- ISO 45001: The standard for occupational health and safety management systems, applied in Session 1 to place hazard detection inside the management system.
- ISO 31000: The guidelines on risk management, applied in Sessions 1 and 4 to rate hazards and choose treatments.
- ISO/IEC 42001: The management system standard for AI, applied in Session 4 to set ownership of detection tools.
- NIST AI Risk Management Framework: A voluntary framework for managing AI risk, applied in Session 4 to test bias and error in alerts.

Intended Participants

- Safety, health and environment leaders who own hazard identification and the controls that follow.
- Operations and site managers who act on alerts and inspection findings.
- Process safety and engineering leads who judge technical risk.
- Digital and data owners who supply cameras, sensors and analytics to safety teams.

Typical settings include construction, manufacturing, logistics and utilities.

Learning Outcomes

1. Participants will be able to compare hazard identification methods and decide where AI adds value.
2. Participants will be able to evaluate site camera and sensor alerts for accuracy, false alarms and blind spots.
3. Participants will be able to construct a near-miss text review that groups reports into recurring hazards.
4. Participants will be able to diagnose bias, drift and over-reliance in AI-supported safety decisions.
5. Participants will be able to prioritise risk reduction actions using the hierarchy of controls.
6. Participants will be able to justify a detection and oversight plan to a safety committee.

Programme Structure

Day 1: Workplace Hazard Detection Foundations

Where can AI help find hazards, and where can it not?

- Hazard Identification Method Comparison
- Site Hazard Register Review
- ISO 45001 Management System Placement
- ISO 31000 Risk Rating Grid
- Detection Use Case Shortlist

Day 2: Near-Miss and Incident Data

What do reports reveal that inspections miss?

- Near-Miss Report Audit
- Incident Text Coding Scheme
- Recurring Hazard Clusters
- Leading and Lagging Indicator Set
- Reporting Culture Check

Day 3: Site Vision and Sensor Alerts

How far can a camera alert be trusted?

- Camera Coverage Map
- Alert Accuracy Table
- False Alarm Log Review
- Privacy and Worker Notice Check
- Response Protocol Sheet

Day 4: Prediction, Oversight and Controls

Who decides when a tool raises a warning?

- Risk Score Reading
- Bias and Drift Screen
- NIST AI Risk Management Framework Mapping
- ISO/IEC 42001 Ownership Review
- Hierarchy of Controls Selection

Day 5: Hazard Detection Plan for One Site

Do the findings join into a plan a committee can approve?

- Applying the Session 1 Detection Use Case Shortlist
- Testing the Session 2 Hazard Clusters
- Checking the Session 3 Response Protocol Sheet
- Reviewing the Session 4 Control Selection
- Completing the Hazard Detection Plan

Methodology

The programme is a data workshop built on prepared records for a construction site and a distribution warehouse. Participants code near-miss reports, read alert logs, test thresholds and choose controls, then defend a plan to peers acting as a safety committee.

- Suggested activity: Coding twenty near-miss reports into hazard groups.
- Suggested activity: Comparing two alert thresholds against a prepared false alarm log.
- Suggested activity: Ranking five controls for one hazard using the hierarchy of controls.

Capstone Output

Each participant completes a hazard detection plan for one operating site. It holds the use case shortlist, a near-miss coding scheme, an alert response protocol, a bias and drift screen and a control selection table. At work it goes to the safety committee for approval and sets the routine for reviewing later detection tools.

Frequently Asked Questions

Is workplace hazard detection training suitable for safety leaders who are not data specialists?

Yes. Workplace hazard detection is taught through prepared site records and templates. You need responsibility for safety, operations or risk, but no programming or statistics background.

Which standards does workplace hazard detection rest on in this training?

Workplace hazard detection here rests on ISO 45001, ISO 31000, ISO/IEC 42001 and the NIST AI Risk Management Framework, each applied to a hazard, risk or ownership decision.

How is the plan from workplace hazard detection training used at work?

You take the hazard detection plan to your safety committee, use its response protocol to act on alerts, and keep its bias and drift screen as the routine for later tools.

How does workplace hazard detection differ from a programme on process hazard analysis?

Workplace hazard detection concentrates on finding hazards from site vision, sensors and incident data, while a programme on process hazard analysis concentrates on structured team studies of process designs.