Dam Safety and Dam Engineering Training Course: Inspection, Monitoring and Emergency Action Plans

14 – 18 June 2027
Amsterdam - Zuidas business district hotel



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Introduction:

Dam safety and dam engineering, covering inspection, monitoring and emergency action plans, is a one-week course for dam owners, water authority engineers, operators and consultants, ending with a Dam Safety Inspection Report and Emergency Action Plan outline for a case embankment dam. Many dams run for years on unread instrument readings, untested spillway gates and emergency plans never exercised, so seepage, erosion and overtopping warnings go unnoticed. Nominees already operate, inspect or oversee dams and work through an inspection walkthrough of dam records, photographs and monitoring data. CoreConcept Training Center delivers this course on dam safety.

Course Objectives:

- Classify embankment, concrete gravity and arch dams by structural behaviour, failure modes and downstream hazard potential
- Check spillway discharge capacity and energy dissipation against the inflow design flood and judge seepage and filter performance in embankments
- Plan and conduct dam safety inspections and rate the condition of the crest, slopes, spillway, gates and outlet works
- Interpret piezometer, settlement, deformation and seepage weir data against alarm thresholds to detect developing problems
- Lead periodic dam safety reviews and prioritise remedial works, gate maintenance and flood operation rules using risk-informed methods
- Prepare a Dam Safety Inspection Report and Emergency Action Plan outline with breach inundation, alert levels and a notification flowchart

Target Audience:

- Dam owner engineering teams accountable for the safety of dams and reservoirs in their portfolio
- Water authority engineering teams that oversee dam operation, maintenance and flood release decisions
- Dam operation and maintenance teams responsible for gates, outlets, surveillance rounds and instrument readings
- Dam safety consultant teams that carry out inspections, safety reviews and risk assessments for owners
- Emergency planning liaison teams that prepare downstream warning and evacuation arrangements for dams

Course Outline:

Day 1: Dam Types, Failure Modes and Dam Safety Governance

- Embankment, Concrete Gravity and Arch Dam Structural Behaviour
- Overtopping, Internal Erosion and Foundation Failure Mode Catalogue
- Hazard Potential Classification by Downstream Consequence
- Dam Safety Governance Roles for Owners, Operators and Engineers
- Dam Safety File Review of Design and Construction Records

Day 2: Hydrology, Spillway Capacity and Seepage Control Principles

- Inflow Design Flood Selection Using PMP and PMF Estimates
- Spillway Discharge Capacity Check for Chute and Labyrinth Spillways
- Stilling Basin and Flip Bucket Energy Dissipation Checks
- Seepage Flow Nets Through Embankment Core and Foundation
- Filter and Drain Criteria Against Backward Erosion Piping

Day 3: Dam Safety Inspections, Instrumentation and Monitoring Data

- Routine, Periodic and Special Dam Safety Inspection Checklists
- Condition Rating Scale for Crest, Slopes, Spillway and Outlets
- Piezometer Readings and Phreatic Surface Interpretation
- Settlement Points, Inclinometers and Pendulum Deformation Trends
- Seepage Weir Flow Records, Turbidity and Alarm Thresholds

Day 4: Dam Safety Reviews, Risk Assessment, Gates and Flood Operation

- Periodic Dam Safety Review Scope and Deficiency Register
- Failure Modes Analysis and Risk-Informed Prioritisation of Remedial Works
- Spillway Gate and Outlet Works Maintenance and Testing Regime
- Reservoir Flood Operation Rules and Gate Release Sequencing
- Dam Break Breach Parameters and Inundation Mapping Overview

Day 5: Inspection Walkthrough: Case Embankment Dam Report and Emergency Action Plan

- Case Embankment Dam Records, Photographs and Instrument Data Review
- Walkthrough Defect Logging for Sand Boils, Wet Spots and Cracks
- Dam Safety Inspection Report Findings and Condition Ratings Drafting
- Emergency Action Plan Alert Levels and Notification Flowchart
- Dam Safety Inspection Report and Emergency Action Plan Completion

Skills You Will Gain:

- Dam Failure Mode Identification
- Spillway Capacity Assessment
- Seepage and Internal Erosion Evaluation
- Dam Condition Rating
- Instrumentation Data Interpretation
- Dam Risk Prioritisation
- Gate and Outlet Maintenance Planning
- Dam Emergency Preparedness

Why Attend This Course:

- Deliver a Dam Safety Inspection Report and Emergency Action Plan outline to the dam owner's safety manager and the emergency planning committee
- Decide when an instrument trend, wet spot or gate defect calls for intensified monitoring, reservoir drawdown or an emergency alert
- Avoid overtopping, uncontrolled seepage and delayed downstream warning caused by untested gates and unread monitoring data
- Share inspection checklists, condition rating scales and alarm threshold sheets with operators who carry out routine surveillance

Conclusion:

Back at work, the participant gives the dam owner's safety manager and the emergency planning committee a Dam Safety Inspection Report and Emergency Action Plan outline for a dam in the portfolio. Managers use the report to fund remedial works, set monitoring frequencies and confirm gate testing, while the emergency plan guides alert decisions and downstream notification. After the first flood event or exercise, the unit should review whether alarm thresholds triggered correctly, whether contact lists worked and whether register deficiencies were closed on time.

Frequently Asked Questions FAQ:

What should participants know before a dam safety and dam engineering course?

Participants should already work on the operation, inspection or oversight of dams or reservoirs and read basic engineering drawings. Bringing recent inspection notes, instrument readings or an existing emergency plan helps them apply the case work to their own dams.

How does dam safety and dam engineering differ from a geotechnical investigation or concrete repair course?

It concentrates on whole-dam safety management: failure modes, spillway capacity, surveillance, instrumentation, safety reviews and emergency planning. Geotechnical investigation courses cover soil testing for new works, and concrete repair courses cover fixing concrete members, which this course touches only briefly.

Why is internal erosion a major concern in dam safety and dam engineering?

Internal erosion can progress inside an embankment or its foundation with little visible sign until a breach develops. Rising seepage, turbid flow, sand boils and sinkholes are the usual warnings, which is why filters, drains, seepage weirs and frequent surveillance matter.

What do participants take back from the dam safety and dam engineering course?

Participants take back a Dam Safety Inspection Report and Emergency Action Plan outline built on a case embankment dam, with inspection checklists, a condition rating scale, instrument alarm threshold sheets and a notification flowchart to adapt for their own dams.