Bowtie Risk Analysis Training Course: Barriers, Escalation Factors and Assurance

8 – 12 August 2027
Kuala Lumpur

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Ref: 942_42497 **Date:** 8 – 12 August 2027 **Location:** Kuala Lumpur **Fees:** 4000 GBP

Programme Summary

Bowtie risk analysis is the subject of this one-week training course for risk, safety, operations and assurance leaders, taught at managerial level and ending in a bowtie assurance pack for one risk scenario. Many organisations hold risk registers that name controls without showing how a hazardous event is prevented, detected or recovered. The programme moves from scenario selection to diagram construction, escalation factors, barrier quality and assurance, using prepared scenarios from an industrial operator and a financial services group. Mars Training Centre UK delivers this programme on bowtie risk analysis to mixed-organisation cohorts.

The Business Case

Organisations that map threats, barriers and consequences on one page can see which controls carry the most weight and which are weak or missing. Where controls are listed in registers without structure, failed barriers are found after an incident rather than before it, and assurance effort is spread evenly instead of aimed at critical controls. The programme works on the measures below.

- Unprotected Scenario Count: Falls when top events are mapped and gaps in barriers are closed.
- Barrier Failure Detection: Improves when indicators and checks are set for each critical barrier.
- Assurance Focus: Sharpens when review effort follows barrier criticality.

Principles and Evidence Base

- ISO 31000: The international standard on risk management principles and process, applied in Session 1 to place the bowtie within risk analysis.
- IEC 31010: The international standard listing risk assessment techniques including bow tie analysis, applied in Sessions 1 and 2 to select and build the method.
- AIChE CCPS bow tie guidelines: Published guidance on bow ties for barrier management, applied in Sessions 3 and 4 to rate barriers and plan verification.

Intended Participants

- Risk managers who own scenario analysis and risk reporting.
- Safety and operations leaders who own critical controls.
- Assurance and audit leads who test whether controls work.
- Business unit heads who accept residual risk for their function.

Typical settings include process industries, aviation, healthcare and financial services.

Learning Outcomes

1. Participants will be able to prioritise risk scenarios that justify a bowtie analysis.
2. Participants will be able to construct a bowtie diagram from a defined top event.
3. Participants will be able to diagnose escalation factors that weaken a barrier.
4. Participants will be able to evaluate barrier quality using agreed criteria.
5. Participants will be able to design indicators and checks that verify critical barriers in operation.
6. Participants will be able to justify a bowtie assurance pack to a risk committee.

Programme Structure

Day 1: Bowtie Risk Analysis Foundations and Scenario Selection

Which risk scenarios justify a bowtie, and how is the top event defined?

- Risk Register Scenario Screening
- Top Event Definition Sheet
- ISO 31000 Process Alignment Map
- IEC 31010 Technique Selection Table
- Hazard and Consequence Inventory

Day 2: Threats, Barriers and Diagram Construction

How are threats linked to consequences through preventive and recovery barriers?

- Threat and Cause Listing
- Preventive Barrier Placement
- Recovery Barrier Placement
- Barrier Classification Grid
- Bowtie Diagram Build Exercise

Day 3: Escalation Factors and Barrier Quality

What weakens a barrier, and how is its quality judged?

- Escalation Factor Identification
- Escalation Factor Control Design
- Barrier Effectiveness Rating
- Human and Organisational Factor Review
- Critical Control Selection Table

Day 4: Assurance, Monitoring and Diagram Upkeep

How are barriers verified in operation, and how is the diagram kept current?

- Barrier Performance Indicator Set
- Verification Task Schedule
- Barrier Health Dashboard Layout
- Incident Learning Update Loop
- Diagram Ownership and Review Protocol

Day 5: Bowtie Assurance Pack for One Scenario

Do the earlier results join into one pack that a risk committee can approve?

- Applying the Session 1 Scenario Screen
- Testing the Session 2 Diagram Build
- Checking the Session 3 Barrier Ratings
- Reviewing the Session 4 Indicator Set
- Completing the Bowtie Assurance Pack

Methodology

The programme is a structured exercise built on prepared scenarios from an industrial operator and a financial services group: incident summaries, control lists, procedures and monitoring records. Participants define top events, build diagrams, rate barriers, test escalation factors and defend their packs to peers acting as a risk committee.

- Suggested activity: Building a diagram for a loss of containment or a payment failure.
- Suggested activity: Rating six barriers against agreed quality criteria.
- Suggested activity: Writing verification checks for three critical controls.

Capstone Output

Each participant completes a bowtie assurance pack for one risk scenario. It holds a top event definition, a diagram with preventive and recovery barriers, escalation factor controls, barrier ratings and a verification schedule. At work it goes to the risk committee and becomes the reference for assurance reviews of that scenario.

Frequently Asked Questions

Is bowtie risk analysis training suitable for managers new to risk methods?

Yes. Bowtie risk analysis is taught from prepared scenarios and templates. You need responsibility for risk, safety, operations or assurance, but no earlier experience of drawing diagrams.

Which standards does bowtie risk analysis rest on in this training?

Bowtie risk analysis here rests on ISO 31000 for risk management process, IEC 31010 for assessment techniques and the AIChE CCPS bow tie guidelines for barrier management.

How is the pack from bowtie risk analysis training used at work?

You take the bowtie assurance pack to your risk committee, use its verification schedule to direct assurance reviews and keep its diagram updated after incidents.