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# Hazard and Operability Study for Plant Modifications Training Course

4 – 15 October 2027
New York

# Hazard and Operability Study for Plant Modifications Training Course

**Ref:** 2556_97223 **Date:** 4 – 15 October 2027 **Location:** New York **Fees:** 14000 GBP

Hazard and Operability Study for Plant Modifications is a 2-week training course for process safety engineers and operations leads who must test changes to running plant before they reach the field, ending in a modification recommendations register. Tie-ins, revamps, bypasses and setpoint changes now arrive faster than original design studies can absorb them. The course from Jupiter Prime Training sets the hazard and operability study for plant modifications inside daily change control.

## Why Hazard and Operability Study for Plant Modifications Matters Now

Three pressures shape modification hazard studies today. Ageing assets are being debottlenecked and re-purposed rather than replaced, so original safeguards are stretched by duties they were never sized for. Experienced operators are retiring, and the tacit knowledge that once caught a risky change at the control room door is thinning. Insurers, owners and contractors increasingly expect a traceable record linking each change to its hazard review. An operator that handles modification studies well keeps its safety case current; one that handles them badly accumulates hidden deviations until an incident exposes them. The course rests on the hazard and operability method itself, layers of protection analysis and bow-tie barrier diagrams.

## Who Gains Most from Hazard and Operability Study for Plant Modifications

- Engineers who chair or scribe hazard reviews for change requests and small projects
- Operations leads who sponsor tie-ins, temporary bypasses and setpoint changes
- Process safety specialists who own the site barrier register and protection layer records
- Technical authorities who approve modifications against the original design basis
- Maintenance and integrity leads who implement mechanical changes during turnarounds

A site change control board gains most when its chair, a process engineer and an operations lead attend together and return with one shared way of scoping and closing modification studies.

## Hazard and Operability Study for Plant Modifications Capabilities

Participants move from reading a change request to running a focused deviation review and defending its recommendations before approval.

- Scope a modification study boundary from marked-up drawings and interfaces — change control board approval
- Facilitate guide word sessions on new and altered nodes — study team agreement on credible deviations
- Assess whether existing safeguards still hold after a duty change — technical authority sign-off
- Calculate protection layer gaps for high consequence scenarios — instrumented function specification
- Build bow-tie diagrams that show barriers degraded by the change — operations and maintenance owners
- Write and track actions in a modification recommendations register — start-up readiness decisions

## Key Hazard and Operability Study for Plant Modifications Terms

- Node — A defined section of plant with a stated design intent, studied one at a time during the hazard review.
- Guide word — A short prompt such as more, less or reverse, combined with a parameter to generate possible deviations.
- Deviation — A departure from design intent, for example high pressure, whose causes and consequences the team then examines.
- Independent protection layer — A safeguard able to stop a scenario on its own, unaffected by the initiating cause or other layers.
- Bow-tie diagram — A picture linking threats, a top event and consequences, with preventive and mitigating barriers drawn on each path.
- Recommendations register — The tracked list of actions from a study, each with an owner, a due point and evidence of closure.

## Hazard and Operability Study for Plant Modifications Day by Day

## Day 1: Modifications in the Lifecycle of a Plant

- Change Request Categories — Which Changes Trigger a Full Hazard Review
- Design Basis Records — Confirming What the Original Study Assumed
- Temporary Versus Permanent Changes — Setting Review Depth and Expiry
- Cumulative Change Effects — Spotting Creep Across Several Small Edits
- Lessons From Modification Incidents — Framing Study Scope Expectations

## Day 2: Scoping the Modification Study

- Marked-Up Drawing Review — Defining Study Boundary and Tie-In Points
- Interface Node Selection — Capturing Upstream and Downstream Effects
- Study Team Composition — Matching Disciplines to the Change Type
- Pre-Study Information Pack — Deciding Readiness to Convene the Team
- Time Boxing Sessions — Balancing Study Depth Against Project Schedule

## Day 3: Guide Words and Parameters on Altered Nodes

- Parameter and Guide Word Matrix — Choosing Credible Combinations Per Node
- Design Intent Statements — Anchoring Deviations to the New Duty
- Cause Identification — Separating Equipment, Human and Utility Failures
- Consequence Escalation — Judging Worst Credible Outcome Without Safeguards
- Scribe Worksheet Conventions — Keeping Records Auditable and Consistent

## Day 4: Facilitating the Study Team

- Chair Questioning Techniques — Drawing Out Operator Field Knowledge
- Managing Dominant Voices — Protecting Quieter Specialists' Input
- Parking Lot Discipline — Holding Design Debates Outside the Session
- Remote and Hybrid Sessions — Maintaining Attention on Shared Drawings
- Session Closure Summaries — Confirming Agreed Deviations and Actions

## Day 5: Safeguards Under a Changed Duty

- Relief Device Adequacy Checks — Confirming Capacity After Rate Changes
- Alarm and Trip Setpoint Shifts — Testing Response Time Margins
- Bypass and Override Controls — Limiting Degraded Protection Periods
- Operating Procedure Revisions — Aligning Steps With New Equipment
- Safeguard Credit Rules — Deciding Which Barriers Count in the Study

## Day 6: Layers of Protection for High Consequence Scenarios

- Scenario Selection From Worksheets — Choosing Cases for Deeper Analysis
- Initiating Event Frequencies — Agreeing Defensible Starting Values
- Independence and Auditability Tests — Qualifying Each Protection Layer
- Risk Gap Calculation — Setting Required Instrumented Function Performance
- Conditional Modifiers — Weighing Occupancy and Ignition Probability

## Day 7: Bow-Tie Barriers for Modified Systems

- Top Event Definition — Linking Bow-Tie Scope to Study Scenarios
- Threat and Consequence Lines — Mapping Paths Opened by the Change
- Barrier Degradation Factors — Showing Weaknesses Introduced by Edits
- Barrier Ownership Assignment — Naming Who Maintains Each Control
- Bow-Tie Communication Packs — Briefing Shift Crews Before Start-Up

## Day 8: Recommendations and Risk Ranking

- Risk Matrix Calibration — Ranking Residual Risk Consistently Across Studies
- Action Wording Standards — Writing Specific, Testable Recommendations
- Rejected Action Justification — Recording Reasoned Alternatives
- Pre-Start-Up Hold Points — Linking Critical Actions to Commissioning
- Study Report Structure — Presenting Findings to the Approving Authority

## Day 9: Sector Cases and Study Quality

- Refinery Furnace Tie-In Case — Testing Interface Node Coverage
- Pharmaceutical Batch Reactor Change Case — Reviewing Sequence Deviations
- Study Quality Audit Checklist — Judging Worksheet Completeness
- Revalidation Triggers — Deciding When Earlier Studies Need Refreshing
- Peer Challenge of Draft Reports — Strengthening Weak Conclusions

## Day 10: Practising the Modification Recommendations Register

- Live Study Session on a Tie-In Change — Applying Scoping and Guide Words
- Protection Layer Review of Ranked Scenarios — Confirming Risk Gap Closure
- Bow-Tie Update for the Altered System — Assigning Barrier Owners
- Action Close-Out Evidence Rules — Setting Verification Before Start-Up
- Modification Recommendations Register — Completing Owners, Hold Points and Status

## Applying Hazard and Operability Study for Plant Modifications After the Course

- Chair a guide word review on the next pending change request, using an interface node list and a pre-study information pack.
- Audit open actions from recent modification studies against close-out evidence rules and re-rank any left without verification.

## Hazard and Operability Study for Plant Modifications Questions FAQ

### What is a hazard and operability study for plant modifications and why does it matter now?

It is a structured deviation review applied to a proposed change on a running plant. It matters now because frequent revamps, retiring operators and stretched safeguards mean small edits can quietly erode the protection the original design relied on.

### Which roles gain most from a hazard and operability study for plant modifications course?

Study chairs, scribes, operations leads and technical authorities gain most. You will benefit if you sponsor, review or approve changes, or if you own protection layer and barrier records that each modification may affect.

### How does a hazard and operability study for plant modifications course differ from a general study leadership course?

It concentrates on changes to existing plant rather than new design. You work on interface nodes, cumulative change effects, safeguard credit under altered duties and pre-start-up hold points, which general study leadership courses treat only briefly.

## What do you bring back from a hazard and operability study for plant modifications course?

You bring back a completed register of study actions for a tie-in case, with owners and hold points. You also return with scoping templates, guide word matrices and bow-tie update steps to reuse on your next change request.

## Hazard and Operability Study for Plant Modifications: The Way Forward

The modification recommendations register is the first record a change control board consults before releasing a change for construction. Study chairs, operations leads and technical authorities use it to confirm that every critical action has an owner and a hold point. After its first use, revisit how safeguard credit was assigned, because that judgement shapes every later protection layer review.