



Document No.	GP 48-05
Applicability	Group
Date	13 February 2009

GP 48-05

Hazard Identification (HAZID) Study

Group Practice

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**



Foreword

This is the first issue of Engineering Technical Practice (ETP) GP 48-05.

This Group Practice (GP) provides requirements on the HAZard IDentification (HAZID) methodology. It defines the scope of a HAZID study, identifies the requirements, and offers guidance based on current industry practice on how to conduct a HAZID.

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1. Scope

- a. This GP provides requirements for the planning, conduct, and documentation of HAZard IDentification (HAZID) studies.
- b. The primary role of a HAZID study is to identify hazards.
- c. HAZID is one technique within a suite of hazard evaluation and risk management tools.
Refer to GRP 3.3-0001.
- d. HAZID is a flexible method that may be used in a wide range of BP projects, BP entities, and other activities to support hazard identification throughout the lifecycle of an operating site from conception to abandonment.
- e. HAZID may be used in various project stages, but it is typically used early in a project to focus on inherently safer design (ISD) and direct future risk reduction activities.

2. Normative references

None.

3. Terms and definitions

For the purposes of this GP, the following terms and definitions apply:

Cause

Event, situation, or condition that results, or could result, directly or indirectly in an accident or incident.

Competent

Describes an individual with knowledge and skills deemed acceptable by the engineering authority (EA) to perform a task. Appropriate knowledge and skill may be acquired through training, experience, qualifications, or some combination of these.

Consequences

Direct, undesirable result of an accident sequence usually involving a fire, explosion, or release of toxic material. Consequence descriptions may be qualitative or quantitative estimates of the effects of an accident in terms of factors such as health impacts, economic loss, and environmental damage.

Entity (BP entity or operating entity)

An organisational unit within BP which may be a Performance Unit, Business Unit, Strategic Performance Unit, Segments or some logical sub group of one of these, defined by the Segment, Function or Region.

Hazard

Condition or practice with the potential to cause harm to people, the environment, property, or BP reputation.

Hazard identification (HAZID)

Brainstorming approach used to identify possible hazards. HAZID studies are very broad in their scope. The HAZID is sometimes called a Preliminary Hazard Analysis.



Hazard and operability (HAZOP)

Systematic qualitative technique to identify and evaluate process hazards and potential operating problems, using a series of guidewords to examine deviations from normal process conditions.

Independent protection layer (IPL)

Device, system, or action that is capable of preventing a postulated accident sequence from proceeding to a defined, undesirable endpoint. An IPL is (1) independent of the event that initiated the accident sequence and (2) independent of any other IPLs. IPLs are normally identified during layer of protection analyses.

Initiating cause

A failure, error, situation, or condition that results or may result in the propagation of a hazardous event.

Risk

A measure of loss / harm to people, the environment, compliance status, Group reputation, assets or business performance in terms of the product of the probability of an event occurring and the magnitude of its impact. Throughout this Practice the term “risk” is used to describe health, safety, security, environmental, and operational (HSSE&O) undesired events.

Node

A discrete area or portion of an activity, plant, or system that permits a stepwise approach towards progressing through the HAZID.

Safeguards

Device, system, or action that would likely interrupt the chain of events following an initiating cause or that would mitigate loss event impacts.

What If analysis

Scenario based hazard evaluation procedure using a brainstorming approach in which typically a team that includes one or more persons familiar with the subject process asks questions or voices concerns about what could go wrong, what consequences could ensue, and whether the existing safeguards are adequate.

4. Symbols and abbreviations

For the purpose of this GP, the following symbols and abbreviations apply:

BLEVE Boiling liquid expanding vapour explosion.

BOP Blowout preventer.

CVP Capital value process.

DCS Distributed control system.

EA Engineering authority.

FEED Front end design.

HAZID Hazard identification.

HAZOP Hazard and operability (study).



HSSE	Health, safety, security, and environmental.
HSSE&O	Health, safety, security, environmental, and operational.
IPL	Independent protection layer.
ISD	Inherently safer design.
LNG	Liquefied natural gas.
LPG	Liquefied petroleum gas.
MOC	Management of change.
OMS	Operating management system.
P&ID	Piping and instrumentation diagrams.
PFD	Process flow diagrams.
PHSSER	Project HSSE review.
TOR	Terms of reference.

5. General

5.1. HAZID purpose

A HAZID is a team based brainstorming analysis used to identify potential process and nonprocess hazards. HAZID studies may be broad in their scope and thus have a wide applicability. HAZID typically examines all reasonably possible sources of hazard, including the process design itself and hazards external to the process design. HAZID can be used to identify hazards during a major project and for proposed changes to existing operations.

The HAZID process is at a higher level compared to a HAZOP study or a What If study. HAZID can be conducted at a unit or system level with little documentation other than a design concept. What If and HAZOP focus on a system or node level and are dependent on accurate process safety information.

HAZID, What If, and HAZOP studies are distinct and complementary activities that may be conducted at different CVP stages as design details and documentation are developed.

The purpose of HAZID is to:

- Identify potential hazards as defined in the TOR for the HAZID study.
- Consider consequences of the hazards.
- Identify safeguards that are in place to provide hazard prevention or mitigation.
- Propose recommendations, as needed, to eliminate, prevent, control, or mitigate hazards.
- Provide assistance to facility management in its efforts to manage risks.
- Support objectives of ISD.

Refer to GP 48-04 on ISD.



5.2. Management responsibilities

Responsibilities for projects and operating facilities shall be as follows:

- a. BP entity leader ensures that organisation and priorities have been established to ensure that HAZID studies have:

- 1. Appropriate priority and attention.
- 2. Commitment of competent resources.
- 3. Time for proper execution.

ISD strategies may include conducting a HAZID to identify potential hazards early in a project. In this case, the HAZID would be included in the ISD plans in accordance with GP 48-04.

- b. BP entity EA or project EA:

- 1. Is responsible for execution of HAZID for projects and major modifications to operating facilities.
- 2. Ensures that:
 - a) Studies for operating facilities comply with this GP and local regulations, if applicable.
 - b) HAZID is included, if appropriate, and functions as a key aspect of hazard and risk management processes.
 - c) Recommendations are resolved and closed out in a timely manner.

6. Timing

6.1. Projects

- a. A HAZID may be conducted for projects that are not required to follow the CVP process.

HAZID is beneficial to add definition to where hazard management efforts should be focused in the further design.

- b. For projects required to follow CVP:

- 1. A HAZID study should be conducted:
 - a) During the Appraise stage or early Select stage of a project as part of the selection process of the conceptual design options.
 - b) To focus future hazard management in design development.

For projects, HAZID studies are conducted during the early stages of the CVP process (i.e., Appraise and Select) to ensure that the potential hazards of each design concept are identified and managed appropriately in the forward design. The HAZID may be used to develop the initial hazard and risk register.

The time to perform a HAZID may be when the design options have progressed to the point at which selection of the preferred option is about to take place. By necessity, the level of detail is limited, focusing on major hazards. The project may prefer to conduct a HAZID earlier, particularly if there are new technologies or hazards involved in the development.

- 2. A HAZID study may be conducted during the late select stage or early define stage of a project, when conceptual design layouts are nearing completion.

A study at this stage has enough detail to be of particular value and is being done sufficiently early for its findings to interact with the FEED process. The time for



starting this study may be the development of layout drawings to the point where the location of major equipment and occupied buildings have been specified. Plant and PFD describe the plant operating envelopes. The output from this study would provide key inputs to the systematic safety assessment of major hazards associated with the detailed design of the new site.

3. When projects move through to Select and Define and further design details are developed, more structured hazard identification techniques should be used (e.g., What If and HAZOP).

Refer to GP 48-02 for HAZOP.

6.2. Existing facilities

For existing facilities, a HAZID may be conducted to:

- a. Cover a broad range of safety hazards that may not be addressed by other hazard analysis techniques.
- b. Aid in populating a hazard and risk register.
- c. Identify hazards associated with a proposed change as part of the management of change process.
- d. Identify, either during a project development or existing asset operations, the potential hazards associated with operations or activities.

This could include activities, such as construction, maintenance campaigns, simultaneous operations, heavy lifts, or equipment transportation activities.

This study would be most beneficial if conducted when the organisational and equipment systems involved are first specified, and a preliminary program of work has been prepared.

7. Terms of reference for HAZID

7.1. General

- a. A TOR shall be:
 1. Developed for each study.
 2. Agreed upon between BP entity/project requesting the study and the HAZID study leader, before the study commences.
 3. Subject to formal endorsement by the BP entity EA, project EA, or delegate.
- b. A typical HAZID TOR document should include:
 1. Objectives.
 2. Scope.
 3. Type of hazards to be included.

The type of hazard can be major hazards, only HSSE hazards, or all hazards.
 4. Methodology, including parameters and deviations, to be used and whether risk ranking will be used.
 5. Personnel that are required to attend the meeting.
 6. Schedule and deliverables.
 7. Report approver, recipient, and distribution list.
 8. Reference documents (e.g., site layout, process type).

