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GP 10-20

Marine Geohazards Evaluation and Assessment

Group Practice

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Introduction

The introduction to this ETP mirrors section 17 of the revised DWOP.

All Geohazard Evaluation activity shall conform to Engineering Technical Practice GP10-20 – Marine Geohazards Evaluation and Assessment.

1.1. General

- 1.1.1. Marine Geohazard reviews shall include requirements for seabed clearance, environmental or archaeological review, and top-hole Geohazard review.
- 1.1.2. Upon, or prior to, access to a new offshore exploration area, SPU Exploration Management shall be informed of the fundamental risks to offshore operations from Marine Geohazards within the leased area.
- 1.1.3. Every standalone offshore well, well cluster, template, or drilling platform operated by BP shall have had a Shallow Hazards Assessment (SHA) produced that shall address the expected drilling risks to a depth of 200m below the preferred setting depth of the first pressure containment string or to a penetration of 750m below seabed, whichever is deeper.
- 1.1.4. The final SHA for a BP well shall be prepared and assured internally by a qualified individual making use of all the facilities at the disposal of a BP staff geoscientist and shall follow the protocol of the Offshore Site Investigation Manual.
- 1.1.5. An SHA shall state the expected risk of a hazard, shallow gas, water flow etc., being present by using the appropriate BP risk classification scheme for the particular hazard in question, see table below for shallow gas:

Classification	Description
High	An anomaly showing all of the seismic characteristics of a shallow gas anomaly, that ties to gas in an offset well, or is located at a known regional shallow gas horizon.
Moderate	An anomaly showing most of the seismic characteristics of a shallow gas anomaly but which could be interpreted not to be gas and, as such, reasonable doubt exists for the presence of gas.
Low	An anomaly showing some of the seismic characteristics of a shallow gas anomaly, but that is interpreted not to be gas although some interpretive doubt exists.
Negligible	Either there is no anomaly present at the location or the anomaly is clearly due to other, non-gaseous causes.



- 1.1.6. An offshore well shall not be sited over the top of a shallow gas anomaly reported to have a potential for having shallow gas presence greater than negligible without a documented operational risk review having been carried out.
- 1.1.7. A new offshore drilling location to be occupied by a bottom founded rig, barge, or platform shall be located on a high-resolution seismic survey line specifically acquired to address the new location. (Ref 1.3.1)
- 1.1.8. On recommencement of surface hole drilling an SHA shall be reviewed and re-issued for any well cluster, template or drilling platform where there has been a hiatus in drilling operations of greater than two years, or where the shallow casing plan, has been amended e.g. deepening of a casing shoe.
- 1.1.9. For a well that is the first BP well drilled in a basin, that has required Exploration Forum approval or where the fundamental Geohazard Level is high, and / or a critical geohazard issue has been identified, a qualified Hazards/pore pressure specialist shall be present aboard the rig to witness the drilling of the top-hole section.
- 1.1.10. A review shall be undertaken for an SHA for any well that has been shelved for a period of greater than a year to ensure: surface location, trajectory, target, or drilling plan has not changed and the SHA contents remain valid. Where changes are identified an MOC process should be applied.
- 1.1.11. If any anomaly is classified with a potential shallow gas presence greater than negligible by shallow hazards assessment, then the surface position of the well shall be relocated outside the anomaly to a location with negligible potential for shallow gas presence.

In the event that an acceptable location with negligible potential of shallow gas presence cannot be identified, then shallow gas shall be assumed present for purposes of well planning and risk mitigation. In such an event, a documented operational risk assessment shall be carried out, reviewed and approved. The document shall consider the following as a minimum:

- Potential presence of shallow gas
 - Potential of shallow gas being abnormally pressured, if present
 - Alternate location
 - Possible use of pilot hole
 - Rig type and capabilities
 - Kill mud requirements
 - Pump capacity
 - Operational practices
 - Riser or riserless configuration
- 1.1.12. Mutually agreed, rig-specific, shallow gas procedures shall be established between BP and the drilling contractor prior to the start of a well and shall cover foreseeable contingencies should shallow gas be encountered.
- 1.1.13. Shallow gas and diverter drills shall be held prior to spud of all wells and regularly until the first pressure containment string is set.



- 1.1.14. A shallow gas kick encountered prior to setting the first pressure containment string shall not be shut in. In such event of shallow gas flow, kill operations will immediately commence by pumping fluid into the well at the maximum sustainable pump rate.

1.2. Floating Drilling Operations

- 1.2.1. Wells shall be drilled riserless until the first pressure containment string has been set, unless:

- It is a government regulation to drill with a riser and diverter installed
- A recirculating mud system is required to drill the hole for surface casing

Prior to use of a riser to drill hole for surface casing, a documented risk assessment shall be performed to address associated risks of riser use.

- 1.2.2. The rig shall be maintained in a state of readiness to move off location whilst drilling surface hole. Where a riser is installed, procedures for well control and riser unlatch will be established in advance.

- 1.2.3. All floating drilling operations carried out with returns to the installation shall be carried out with a diverter system installed.

1.3. Bottom Founded, Barge and Platform Drilling Operations

- 1.3.1. A high-resolution seismic survey shall be performed for all locations. New locations shall always be chosen to fall upon a high-resolution survey line specifically acquired to address the location.

- 1.3.2. Wells shall be drilled with a diverter system installed for all hole sections after setting structural conductor or drive pipe and before setting the first pressure containment string.

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 10-20 dealing with Marine Geohazards Evaluation and Assessment. This Group Practice (GP) replaces the relevant parts of the Drilling and Well Operations Policy BPA-D-01.

Description of Risk

The presence of unrecognised, or misinterpreted, Geohazards at the seabed or in the shallow section of the overburden poses a significant risk to well operations, development projects and production operations.

Marine Geohazards characterisation is, therefore, considered a zero tolerance activity within BP.

Errors associated in Marine Geohazards characterization have, in the past, lead to harm to people, damage to the environment, and the undermining of BP's operational reputation. To preclude the recurrence of such events, Marine Geohazards requires a definition of practices that establish the minimum requirements for performing evaluation and assessment of risk.

The purpose of this document is to establish the minimum requirements in Marine Geohazards Evaluation and Assessment that aligns to the needs of the three related common processes: Exploration (Ecp), Drilling and Completions (BtBcp) and Major Projects (MPcp). These requirements should be met by both employees and contractors acting on behalf of BP in the execution of Marine Geohazards projects in support of BP operated wells and development projects.

Note: This Practice reflects the balanced judgment of the BP Group and is based on experience and inputs from a variety of sources. However, it should be recognised that risk can never be eliminated and, as we learn, the Group may have to adjust the acceptable risk envelope and the Minimum Requirements of this Practice. This would result in an updated edition of this Practice being issued by the relevant authority.

What is the Marine Geohazard Recommended Technical Practice?

The Marine Geohazards Practice is intended to ensure that there is a formal approach to managing the risks associated with the identification, assessment and evaluation of Marine Geohazards that could effect our exploration, drilling, development and production operations, that these risks are identified, assessed and controlled in a methodical way so that they can be avoided or mitigated in an effective manner in design of well or facilities such as to remove or reduce the risks identified to an acceptable level.

The Technical Practice is supported by the D&C function as an ETP and the Geoscience function as a GeoRP.

The primary aim of this Practice is to prevent safety incidents or environmental damage. However, the processes may be extended to include other aspects of performance.

This BP Practice sets out to describe a systematic approach for evaluation and assessment of risks associated with Marine Geohazards that is fitted to align with the three main BP common processes: Ecp, BtBcp and MPcp.



The process seeks to define outputs, quality assurance review points and the relative roles of Geological/Geophysical Site Investigation Specialists and Geotechnical Site Investigation specialists and to define the hand-off process aligned to the CP structure.

Who is it for?

This Practice is intended for the use of following groups:

- Those directly involved in every day delivery of Marine Geohazard assessments in support of drilling or facility engineering design and construction.
- Those in allied or overlapping skills segments that require understanding of their own linkage or point of input to the Marine Geohazards Process such as Pore Pressure Specialists, Environmental scientists, etc.
- Those for whom such assessments are required in support of their business needs as defined by either BP Common Process or Policy definition, or by external regulatory requirements.
- Wells or Project management who require understanding of process fundamentals and requirements to be able to understand budget requirements and schedule impacts

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In the event of a conflict between this document and a relevant law or regulation, the relevant law or regulation shall be followed. If the document creates a higher obligation, it shall be followed as long as this also achieves full compliance with the law or regulation.



Table of Contents

	Page
Introduction	2
Foreword	5
1. Scope	9
2. Normative references.....	9
3. Terms and definitions.....	10
4. Symbols and abbreviations	13
5. Practice Structure	14
5.1. Requirements and Recommendations	14
5.2. Language.....	14
5.3. References and Responsibilities	15
6. Accountability.....	15
6.1. Minimum Requirements	15
6.2. Recommendations	15
7. Competence	16
7.1. Minimum Requirements	16
7.2. Recommendations	16
8. Exploration Pre-Access, Access	17
8.1. Minimum Requirements	17
8.2. Recommendations.....	17
9. Exploration Portfolio Build.....	18
9.1. Recommendations	18
10. Exploration Prospect Definition, BtB Appraise-Select.....	19
10.1. Minimum Requirements	19
10.2. Recommendations	20
11. BtB Define-Execute.....	21
11.1. Minimum Requirements	21
11.2. Recommendations.....	22
12. MPcp Appraise	22
12.1. Minimum Requirements	22
12.2. Recommendations	23
13. Satellite Exploration and Drilling Renewal	23
13.1. Minimum Requirements	23
13.2. Recommendations.....	23
Annex A Fundamental Marine Geohazard Risk Evaluation	25
A.1. The Geohazard Risk Pictogram	25
A.1.1 Shallow Structural Complexity.....	25



A.1.2	Regional Seismicity.....	26
A.1.3	Shallow Deposition Rate	27
A.1.4	Shallow Hydrocarbon Presence	27
A.1.5	Database Quality	28
A.1.6	Pictogram Display	29
A.1.7	Fundamental Geohazard Risk.....	29
A.2	The Geohazard Risk Cross Plot.....	29
Annex B	Geohazard CRS Map Construction.....	31
B.1	General.....	31
B.2	CRS Map Colours.....	31
B.3	CRS Map Component Layers	31
B.3.1	Seabed Slope Angle	31
B.3.2	Slope Stability Stand-off Zones	32
B.3.3	Seabed Environmental Constraints.....	32
B.3.4	Archaeological Features or Munitions Disposal Zones	33
B.3.5	Shallow Gas Anomalies	33
B.4	Superimposed Line Detail.....	34
B.4.1	Seafloor Geomorphological Elements.....	34
B.4.2	Seafloor or Shallow Faults	34
B.4.3	Shallow Soils Provinces	34
B.5	Chart Commentary.....	34
B.6	Management of Change	35
Annex C	Integrated Geological Model.....	36
C.1	Start Point.....	36
C.2	Final Desired Outcome	36
C.3	Model Review	36
C.4	QRA.....	37
Annex D	Marine Geohazard Peer Review Terms of Reference.....	38
D.1.	Review Team (minimum requirements):.....	38
D.2.	Site Investigation Project Team Participants:	38
D.3.	Objectives:.....	38
D.4.	Desired Outcomes	39
Annex E	Administration.....	40
E.1.	Administration and Authorisation.....	40
E.2	Auditing, Compliance and Deviation	40

1. Scope

This Practice applies to work on any BP operated offshore well or offshore development project (Field, Transportation or Communications).

A BP Company is a company in the BP Group or other legal entity where BP has operational control, is responsible for HSSE, and has the right to impose these requirements.

In situations where BP does not have control (i.e. a joint venture where BP is not the operator) BP staff should endeavour to ensure that the operator implements processes that meet the minimum requirements in this document.

The marine geohazard practice does not detail requirements for assessment and clearance of geohazards for onshore wells or engineering projects.

For onshore wells a detailed review of historical data from offset wells shall be performed to assess the potential of encountering geohazards such as shallow gas. This review should be an integral part of the No Drilling Surprises process in the well planning.

For any onshore construction, or engineering, projects the geohazards review process should follow the rationale set out in ETP GP 43-27 issued by the Geotechnical Engineering Segment Technical Authority (GESeTA).

Applicability

For the purpose of this Group Practice, the workforce comprises BP employees and every employee of any other company or other legal entity that has been engaged to perform work on BP-operated reservoirs or production/injection infrastructure. A BP-operated reservoir for the purposes of this document includes any site or location used for the injection or extraction of fluids that is owned or operated by or for a BP Company.

In situations in which BP does not have control (i.e. a joint venture where BP is not the operator) BP should attempt to persuade the operator to employ practices at least meeting the Minimum Requirements in this document.

In the event of a conflict between this Group Practice and a relevant law or regulation, the relevant law or regulation will be followed. If the Group Practice creates a higher obligation, it should be followed as long as full compliance with the law or regulation is achieved.

Subject to the Group Practice's intent and subject to existing contractual constraints (to the extent that they cannot be renegotiated) this Group Practice shall be applied to all contractors and their associated subcontractors who perform work on BP-operated reservoirs or on behalf of BP and shall be incorporated in all tenders and contracts.

2. Normative references

The following normative documents contain requirements that, through reference in this text, constitute requirements of this technical practice. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this technical practice are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies.



BP

BPA-D-001	BP Drilling & Well Operations Practice
BPA-D-005	Offshore Site Investigation Manual
BP Seafloor Hardground & Chemosynthetic Community Interpretation Guide Points	
BP Shallow Gas Interpretation Guide Points	
BP Shallow Water Flow Interpretation Guide Points	
Drilling and Completions - Common Process Guidelines,	
	Issue 2, August 2004
Exploration & Production - Exploration Common Process,	
	2006
Exploration & Production - Major Projects Common Process,	
	Version 2, February 2007
Exploration & Production - Major Projects Common Process, Appraisal Guideline,	
	September 2007
GP 43-27	Managing Terrain Issues and Geohazards in Onshore Pipeline Projects
ISO Petroleum and Natural Gas Industries – Specific Requirements for Offshore Structures	
	Part 2: Seismic Design Procedures and Criteria
	BS EN ISO 19901-2: 2004

3. Terms and definitions

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

Accountable Person

The person in the organization who has ultimate responsibility.

Appraise

Initial stage of a CVP process, for example in MPcp.

Assess

To consider and make a judgment upon.

Assurance

A guarantee, giving certainty.

Auditing

A formal or official examination and verification. The audit process should include monitoring, review, and reporting of the outcome of the audit to those people who can implement any changes needed.

Authority

Official permission.

A position that has the power to make a judgement; an individual cited or appealed to as an expert.

The power to influence or command.



BP

BP, and no other former meaning as an abbreviation

BP Company

A company in the BP Group, or a company or other legal entity where BP has operational control, is responsible for HSSE and has the right to impose this Standard.

BP Employee

A person employed by a BP Company.

BP Operations

BP Business Units, projects, facilities sites and operations

BP Premises

Any site, location or marine vessel that is owned or operated by or for a BP Company.

Competency

The ability to perform a task in the correct manner with the correct understanding and reasoning behind the task.

Competent Person

A person who has demonstrated that they have the knowledge, training and experience required to perform the defined role to the standard required.

Confirm

To support or establish the certainty or validity of; verify.

Contractors

A Company or individual who is under a contractual relationship to supply BP plc or one of its subsidiary companies with Goods and Services and is working solely for the benefit of BP.

A contractual relationship includes:

- All individuals contracted directly or sub-contracted.
- All employees of companies contracted directly or sub-contracted.
- All situations where a contract has not been raised but BP's procurement policy would normally expect there to be a contract in place. This applies to all levels including sub-contracted relationships.

Note: For the purposes of HSSE reporting any sub-contractor should be treated as if they held a contract directly with BP plc or one of its subsidiary companies.

Control

- a) A mechanism used to regulate a physical process or activity.
- b) An action to mitigate risk.
- c) The power to direct (usually through authority).



Document Control Management System

An established means of controlling the issue, use and updating of documents used in the management of a site. A full document control management system (DCMS) will include reference numbers on documents, means of tracking changes and updates and regular audits of the system to confirm compliance.

Eliminate

To remove or get rid of.

Formal

A formal process or agreement is one that is written, recorded and audited. It may also include tracking to confirm that work is following the process or agreement.

Minimum Requirements

The activities, tasks or deliverables that shall be completed to comply with this Practice.

Monitoring

The routine function of regular inspection carried out by a responsible and competent person.

Operational Control

Where BP has responsibility for the activity as owner or under a contractual obligation with the owners of the entity and, as a consequence, has appropriate authority to manage directly all HSSE aspects of the operational activities to meet BP policy and expectations.

Plan

The function of task (work) identification, interaction and sequencing including, preparation and completion requirements, to achieve an outcome.

Policy

Plan of action pursued by the Company (BP) with which all personnel shall comply.

Procedure

A detailed document either in paper or electronic form which sets out sequential or parallel actions which shall be followed by those engaged in carrying out an activity.

Process

A detailed description of a management system or a production operation.

Risk

Possibility of loss, injury, damage, or exposure to hazard or danger.

Risk Assessment

The process of hazard identification and the assessment of the potential for identified hazards to be realised in any given activity.

Roles

The documented description of personnel functions within a management structure.

Routine

A procedure that does not vary in its execution.



Single Point Accountable

The person in the organization (site/Business Unit) who has been appointed as being accountable for the delivery and performance of an activity.

Succinct

Clear, precise expression in few words.

Training

The bringing of a person to a desired degree of proficiency in some activity or skill. Training should only be carried out by people who have been assessed as being competent to train.

Task

An activity in support of a piece of work.

Work

An activity made up of a number of different tasks.

Workflow

An activity made up of a sequence of different tasks designed to deliver a desired outcome.

Workforce

BP employees and every employee of any other company (includes all contractors) or other legal entity that has been engaged to perform work on BP Premises.

4. Symbols and abbreviations

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

BtBcp	The D&C Beyond the Best Common Process
CoP	Community of Practice, the Geoscience replacement for “Network.”
cp	Common Process
CRS	Common Risk Segment
CVP	Common Value Process
D&C	Drilling and Completions
DCMS	Document Control Management System
DWOP	Drilling and Well Operations Policy (BPA-D-001)
Ecp	Exploration Common Practice
ETP	Engineering Technical Practice, the D&C and Engineering equivalent of a GeoRP.
GDE	Gross Depositional Environment
GeoRP	Geoscience recommended practice. The Geoscience equivalent of an ETP.
GESeTA	Geotechnical Engineering Segment Technical Authority

