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Guidance on Practice for Design and Location of Occupied Permanent Buildings Subject to Blast, Fire, and Gas Hazards on Onshore Facilities

GP 04-30

BP GROUP
ENGINEERING TECHNICAL PRACTICES

Foreword

This is the first issue of Engineering Technical Practice (ETP) BP GP 04-30.

This Guidance on Practice (GP) addresses building design and location requirements to mitigate blast overpressure, thermal radiation, and toxic/flammable gas infiltration risks from sources external to the building. There are limitations to risk reduction that can be afforded by building design and location. Residual risk is managed by engineering controls, administrative controls, and emergency response procedures.

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1. Scope

- a. This GP defines requirements for design and location of occupied permanent buildings on onshore facilities (referred to as “buildings”) subject to blast, fire, and gas hazards.

For guidance on management of risk to occupants of existing buildings, refer to GN 04-006.

For guidance on design and location of occupied portable buildings, refer to RM GP 04-30.

Certain buildings or portions of buildings may be excluded because they are not occupied. See 3 for definition of occupied.

- b. This GP provides guidance on design features required to protect occupants from potentially harmful physical effects (blast overpressure, thermal radiation, flammable gas infiltration, and toxic gas infiltration) that may arise from accidental events external to a building.

Protection of occupants from potentially harmful effects of accidental events arising within a building (releases from equipment containing toxic/flammable fluids, dust explosion, electrical fires, etc.) is not covered in this GP. Refer to GP 24-10.

Guidance on design for environmental events (extreme temperatures, wind, flooding, landslide/subsidence, seismic, tsunami, ice and snow loading, volcanic activity, etc.) is not covered in this GP. Refer to GP 04-20.

For guidance on other layout requirements, refer to GP 44-10.

- c. This GP defines minimum requirements for inclusion in site emergency procedures and control procedures.

2. Normative references

The following normative documents contain a variety of potentially relevant good practices that, though referenced in this text, constitute requirements of this technical practice where applicable. 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

GN 04-001	WBE Project No. A100-301 - Upgrades to Mitigate Hazards from Non-Structural Components in Blast Loaded Buildings. Part 1 of 3 Interior Components.
GN 04-002	WBE Project No. A100-301 - Upgrades to Mitigate Hazards from Non-Structural Components in Blast Loaded Buildings. Part 2 of 3 Windows.
GN 04-003	WBE Project No. A100-301 - Upgrades to Mitigate Hazards from Non-Structural Components in Blast Loaded Buildings. Part 3 of 3 Doors.
GN 04-004	WBE Petrochemical Industry Recommended Practice on Design of Blast Resistant Buildings, April 1998.
GN 04-005	Commentary on WBE Petrochemical Industry Recommended Practice on Design of Blast Resistant Buildings, April 1998.
GP 04-10	Drainage Systems.
GP 04-20	Civil Engineering.
GP 14-02	Heating Ventilation and Air Conditioning Design Onshore.



GP 24-03	Concept Selection for Inherently Safer Design.
GP 48-50	Major Accident Risk Process.
GP 04-20	Civil Engineering.

American Concrete Institute (ACI)

ACI 318	Building Code Requirements for Reinforced Concrete.
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British Standards Institute (BS)

BS 8110	Structural Use of Concrete.
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3. Terms and definitions

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

ERPG

Emergency response planning guideline (ERPG) values are intended to provide estimates of concentration ranges where adverse effects might reasonably occur (as described in definitions for ERPG 1, ERPG 2, and ERPG 3) as consequence of exposure to a specific substance. Emergency response planning committee of the American Industrial Hygiene Association sets ERPG values.

ERPG 1

ERPG 1 is maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour.

ERPG 2

ERPG 2 is maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hr without experiencing or developing irreversible or other serious health effects or symptoms that could impair individual ability to take protective action.

ERPG 3

ERPG 3 is maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to 1 hr without experiencing or developing life threatening health effects.

Occupancy

Measure of amount of time personnel spend in a location. This is normally expressed as number of personnel hours per unit calendar time (e.g., personnel hr/d).

Occupied

Building shall be considered occupied if its primary purpose is to provide workspace or accommodation for personnel, irrespective of occupancy. Typical examples include office buildings, control rooms, laboratories, and gate houses.

If the primary purpose of a building is to house equipment (turbine enclosure, compressor shelters, motor control center [MCC] rooms, analyser shelters, instrument outstation, process equipment enclosures in regions of severe weather, etc.), it shall not be considered occupied, unless occupancy under normal operational conditions averages 2 man-hr or more in any 24 hr period.

If a building has distinct sub buildings with different primary purposes (e.g., an enclosed office within a store building or an instrument room/MCC connected to a control room), occupancy of each part of the building may be considered separately.

