



GP 65-65

Design of Turret Systems

DRAFT FOR REVIEW

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Foreword

This is the first issue of Engineering Technical Practice (ETP) GP 65-65. This Group Practice (GP) is not based on heritage documents from the merged BP companies.

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1. Scope

- a. This GP provides guidance and specifies requirements for the selection, design, installation, and integrity management of production turret systems worldwide.
- b. It is applicable to internal and external turret systems with both passive and active drive systems, which are either permanently connected to a floating facility or disconnectable.
- c. For the purpose of this group practice the turret system is defined as the shaft, chain table, moonpool, bearings; swivel stack, swivel access and gantry structure, and the intermediate pipework, manifolding and cabling linking the swivel to the risers and umbilicals. Figure 1 and Figure 2 show the general arrangement of an internal and external turret respectively indicating the key areas to which this GP applies.
- d. This GP is not applicable to the hull structure supporting the turret, mooring lines and their connectors, risers and umbilicals below the turret level, and fluid transfer systems other than swivels, for example drag chains.

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Figure 1 - An internal turret

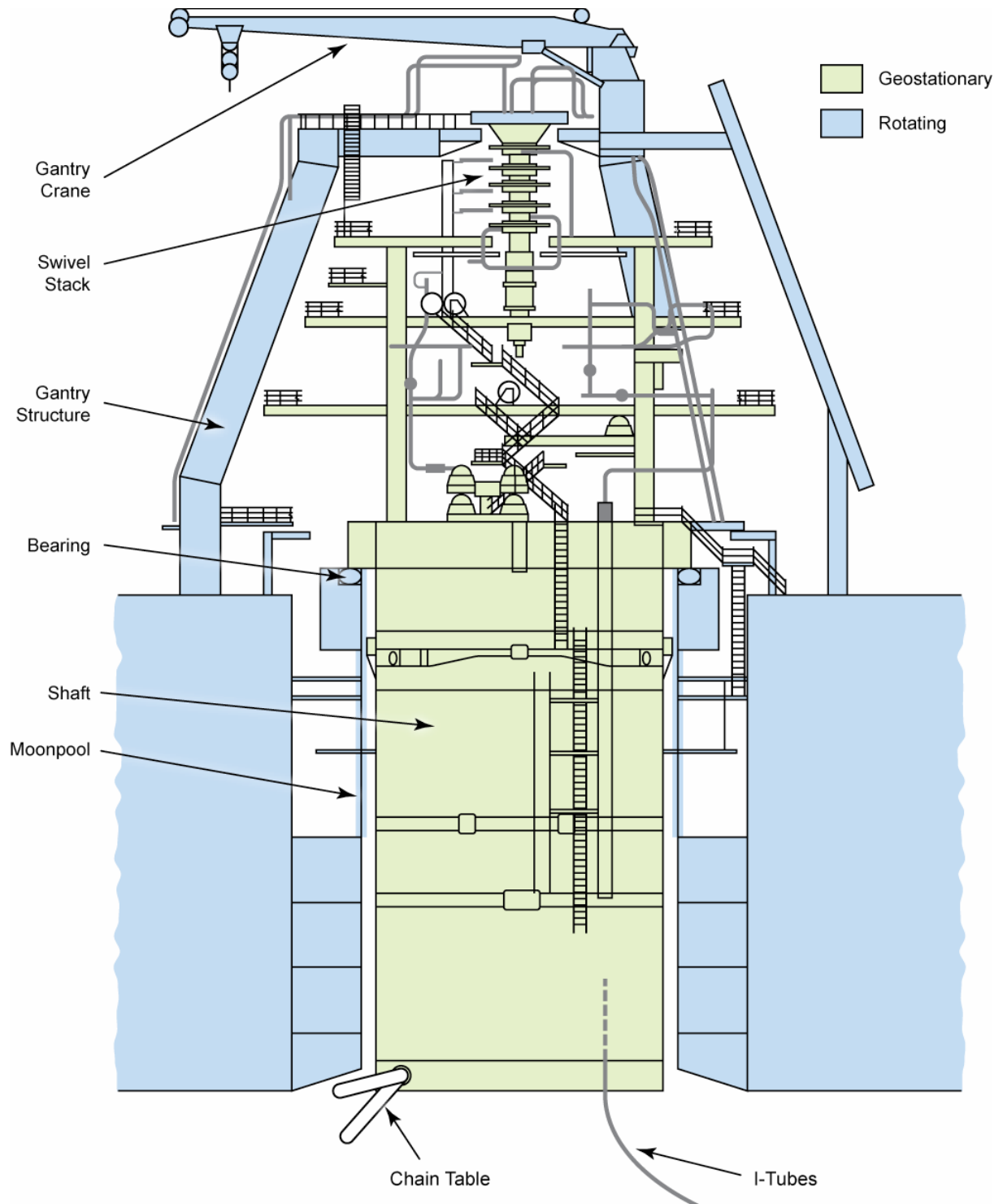
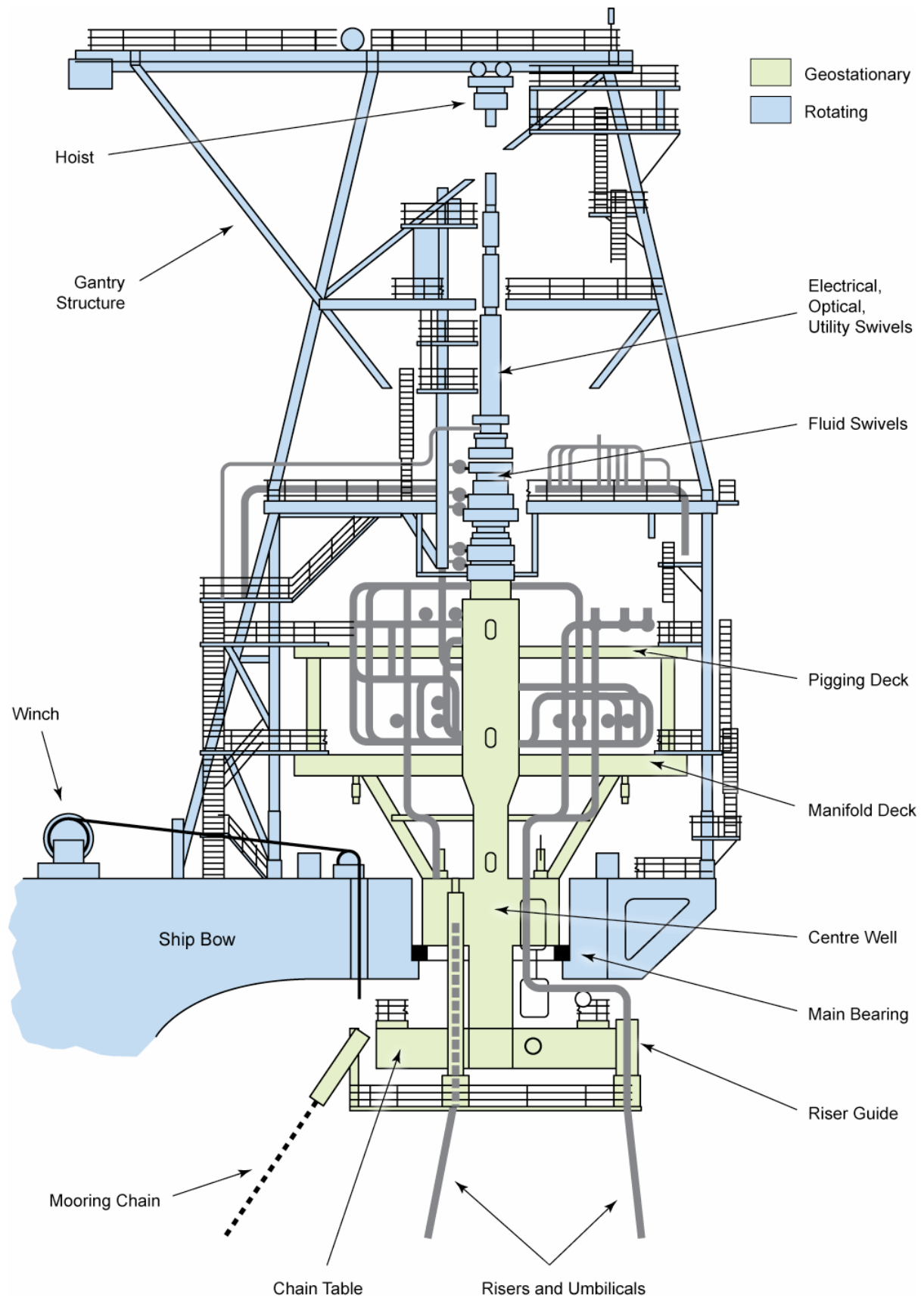


Figure 2 - An external turret



2. Normative references

The following referenced documents may, to the extent specified in subsequent clauses and normative annexes, be required for full compliance with this GP:

- For dated references, only the edition cited applies.
- For undated references, the latest edition (including any amendments) applies.

BP

GP 06-14	Erosion Control.
GP 06-25	Design for the Prevention of Corrosion under Insulation and Fireproofing (CUI and CUF).
GP 06-31	Cathodic Protection.
GP 06-60	Painting of Metal Surfaces.
GIS 06-601	Painting of Metal Surfaces.
GP 14-03	HVAC - Offshore.
GP 24-23	Active Fire Protection - Offshore.
GIS 24-231	Water Deluge System Design.
GP 24-24	Offshore Passive Fire Protection.
GP 30-85	Fire and Gas Detection.
GP 42-10	Piping Systems (ASME B31.3).
GP 43-50	Pigging, Pig Launchers and Receivers.
GP 46-01	New Pressure Vessels.
GP 48-04	Inherently Safer Design.
GP 59-82	Public Address, General Alarm and Emergency Broadcast Systems.
GP 62-01	Guidance on Practice for Valves.
GP 65-10	Integrity Management for Floating Structures.
GP 65-20	Design of Floating Hull Structure and Stability.
GP 65-55	Station Keeping - Design of Mooring Systems.
GP 78-06	Guidance on Practice for Qualification of Technology for Subsea Projects.
GN 06-001	Erosion Guidelines.
GN 36-005	Guideline for Avoiding Gas Decompression Damage of Elastomer Seals.
GN 42-003	Compact Flanges (ETC.85.ER.219).
GN 65-714	Flow Induced Pulsations Guidance Note.
GDP 5.0-0001	BP Group Defined Practice for Integrity Management.
GRP STD 04	BP Group Marine Standard (GMS).
GRP 2.2-0001	BP Group Recommended Practice for Competence Assurance.

British Standard Institution (BSI)

BS ISO 281	Rolling bearings - Dynamic loading ratings and rating life.
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International Electrotechnical Commission (IEC)

IEC 60529	Degrees of protection provided by enclosures (IP code).
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International Standards Organisation (ISO)

ISO 19904-1

Petroleum and natural gas industries - Floating offshore structures -
Part 1: Monohulls, semi-submersibles and spars.

3. Terms and definitions

For the purpose of this group practice, the following terms and definitions apply:

Disconnectable turret

A turret system designed to allow the geostationary section, or part thereof, to disconnect from the host vessel.

Drag chain

An alternative to a swivel stack where the risers are connected to the process plant via flexible pipes in an S-arrangement accommodated within a large cage that rotates with the turret.

External turret

A turret system that is located external to the host vessel's hull, typically on a cantilevered support structure on the bow or stern of the vessel.

Flow induced pulsations

A phenomenon observed in some rough bore unbonded flexible gas risers, where vortices shed from the carcass cause low amplitude acoustic pulsations that are transmitted to the adjacent topsides and subsea piping.

Fluid transfer system

The mechanism for transferring process fluids and signals from the geostationary to rotating part of a turret, typically a multipath swivel.

Gantry structure

A rotating structure that typically supports a gantry crane and conveys pipework and cables to the host vessel. It includes personnel access, and may provide flare shielding and weather protection in some designs.

Internal Turret

A turret system that is located within a moonpool in the host vessel's hull.

Moonpool

On an internal turret, refers to the vessel structure adjacent to the shaft and the annular space between the vessel and the shaft.

Shaft

A geostationary structure that transmits the loads from the risers, umbilicals, mooring lines and other geostationary components of the turret to the turret bearings.

Single point mooring

A mooring system extending from the base of a turret system to the seabed.

Swivel access structure

A rotating permanent structure to provide access to different levels of the swivel stack for routine inspection and maintenance.

Swivel stack

A series of swivel rings, internal core and other individual components that comprise a multipath swivel.

Turret

A mechanical system that allows a vessel to connect to and weathervane about a geostationary mooring and riser system.

Turret equipment room

A geostationary controlled environment room in which electrical and control equipment, not certified for classified hazardous areas, are housed.

Weathervaning

Rotation of a vessel about a geostationary mooring system in response to metocean conditions.

4. Symbols and abbreviations

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

CCR	Central control room.
ESD	Emergency shut down.
ETP	Engineering technical practice.
E&P	Exploration and production.
FE	Finite element.
FLIP	Flow induced pulsations.
FORJ	Fibre optic rotary joint.
FMEA	Failure modes and effects analysis.
GP	Group practice.
GDP	Group defined practice.
GN	Guidance note.
GRP	Group recommended practice.
HPU	Hydraulic power unit.
HV	High voltage.
HVAC	Heating, ventilation and air conditioning.
ICE	Instrument, control, and electrical.
ICS	Integrated control system.
IM	Integrity management.