



Exploration & Production

GENERAL SPECIFICATION

LOGISTICS AND OPERATIONAL SUPPORT

GS EP LSO 306

Selection and Operation of Dynamically Positioned Vessels
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1. Scope

This General Specification defines the types of equipment and minimum performance levels required to conduct operations safely on board a dynamically positioned (DP) vessels. This General Specification shall be used for the initial selection and subsequent operation of a DP vessels for activities where DP is used as a means of station keeping.

DP vessels operated or chartered by an affiliate shall comply with this General Specification. Additionally, project-specific operational guidelines shall be established for each project and implemented during the execution of the work.

The requirements in this General Specification are applicable to the following activities:

- routine offshore operations
- offshore construction
- accommodation support
- DP offshore support vessels assisting in specific construction activities
- Vessels shall comply with all applicable Class and Flag State regulations.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
IMCA M 103	Guidelines for the design and operation of dynamically positioned vessel
IMCA M 117	The training and experience of key DP personnel
IMCA M 185	International guidelines for the safe operation of dynamically positioned offshore supply vessel
IMO MSC Circular 645	Guidelines for vessel with Dynamic Positioning systems
IMO MSC Circular 738	Guidelines for Dynamic Positioning system (DP) Operator Training



Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. General

3.1 Philosophy

The philosophy of managing operations on a DP Vessel shall be based on gaining a clear understanding of the safest mode of operation for the vessel. A pre-contract verification process shall be initiated to gain this understanding. Upon final selection of the vessel and award of a contract, the Contractor shall develop Activity Specific Operational Guidelines or Well Specific Operational Guidelines which shall be used to execute DP operations safely. The Principal shall be engaged in the development/review and approval of this document. For critical operations, the safest mode of operation shall be decided in collaboration with the Contractor and shall be included in the Activity Specific Operational Guidelines or Well Specific Operational Guidelines.

The overriding philosophy shall be to:

- understand the worse case failure and significant single point failures (if any) of the DP system
- determine the configuration for the safest mode of operation
- undertake Defined Critical Activities with the vessel's DP system, configured for the safest mode of operation



- ensure that all key DP Personnel on the vessel are brought to the same level of understanding with regard to the Activity Specific Operational Guidelines / Well Specific Operational Guidelines
- have robust contingency plans in place.

3.2 Applicable Specifications

The following specifications shall be complied with by the Contractor unless specifically directed otherwise by the Affiliate or DGEP Technical Experts:

- **IMCA M 103** - Guidelines for the design and operation of dynamically positioned vessels
- **IMCA M 185** - International guidelines for the safe operation of dynamically positioned offshore supply vessels. (For Offshore Supply Vessels only)
- **IMO MSC Circular 645**
- **IMO MSC Circular 738**.

Note: Not every job requires the use of all the above specifications. An Affiliate shall supply the required specifications with the Invitation to Tender and Contract documentation.

3.3 DP CLASS

3.3.1 General

All vessels operating on DP shall comply with IMCA Guidelines with respect to DP Operations. A requirement to comply with IMCA Guidelines shall form part of any Charter Party or contract where a vessel may be required to operate on DP as part of the intended operations.

The DP equipment class required for a particular operation shall be based on a risk analysis of the consequences of a loss of position for the specific activity being considered. This DP Class shall not be less than the minimum DP Class required as shown in the table below. A Risk Assessment shall be carried out, with respect to the intended operations, by a risk assessment team that shall have at least one marine specialist as part of the team and, any recommendations arising from the risk assessment shall be implemented prior to the DP operations taking place.

In certain areas of operation the local government or Coastal State may dictate the minimum class required which may be higher than that required according to DGEP Rules.

3.3.2 DP Class Notation

Some Classification Societies use different notations compared to the ones given by IMO.

	IMO	Corresponding Class Notations			
Description	DP Class	ABS	LRS	DNV	
Manual position control and automatic heading control under specified maximum environmental conditions	-	DPS-0	DP (CM)	DNV-AUTS	DPS O
Automatic and manual position and heading control under specified maximum environmental conditions. A single fault may result in loss of position.	Class 1	DPS-1	DP (AM)	DNV-AUT	DPS 1
Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault excluding loss of a compartment. Systems to be provided and configured such that a fault in any active component or system will not result in loss of position. (Two independent computer systems running and aligned)	Class 2	DPS-2	DP (AA)	DNV-AUT R	DPS 2
Automatic and manual position and heading control under specified maximum environmental conditions, during and following any single fault including loss of a compartment due to fire or flood. Systems to be provided and configured such that a fault in any active component or system will not result in loss of position. (At least two independent computer systems running and aligned with a separate back-up system separated by A60 class division).	Class 3	DPS-3	DP (AAA)	DNV-AUT RO	DPS 3

3.3.3 Minimum required DP Class levels according to type of operation

Table 1 shows the minimum DP Class level required when conducting particular types of operations. Each type of operation should be risk assessed and, where the assessment shows that a higher DP Class is required than that shown in the table, watercraft with the higher DP Class shall be used.



DGEP Technical Experts shall be consulted regarding the DP Class of Operation required for any watercraft for those types of operation not listed in **Table 1**.

Table 1 - Minimum DP Class Requirements

Type of operation	Location	DP Class of Operation*
Drilling	World-wide	3
Production	World-wide	3
Works and wireline operations to sub-sea wells	World-wide	3
Underwater operations where divers are required to enter an enclosed or confined space, e.g. wellhead, subsea manifold, wreck, or inside the anchor pattern of moored watercraft such as a MODU or FU.	World-wide	3
Accommodation operations hotel / living quarters.	World-wide Gangway in place	2
Underwater operations with saturation or surface supplied diving.	World-wide	2
Manned underwater operations such as submarine, atmospheric suit.	World-wide	2
Marine operations such as pipeline and cable laying, covering, burying, well stimulation (platform and satellite wells)	World-wide	2
Marine heavy lift operations such as lifting and piling.	World-wide	3
Operations requiring watercraft and/or ROV to be directly connected to a subsea system via wire, rope, pipe, hose or other means.	World-wide	2
ROV, ROT, AUV operations	Less than 300 m from an installation	2
ROV, ROT, AUV operations	More than 300 m from an installation	1
Acoustic, Seismic or VSP vessels	Less than 300 m from an installation	2
Acoustic, Seismic or VSP vessels	More than 300 m from an installation	1
Bow loading	Loading location (buoy, etc)	1



Type of operation	Location	DP Class of Operation*
Bow loading	FPSO/FSO	2
Supply vessel / AHTS (Anchor Handling Tug Supply vessel) if DP mode is required.	World-wide	1
Fire Fighting (FiFi) if DP mode is required	World-wide	1

*in accordance with IMO notation

3.4 Technical Capability

Contractors shall provide necessary documentation for assessment of the technical capability of the DP Vessel being proposed. Documentation and evidence shall also be provided to help assess the competence of the Contractor's operational management and personnel.

4. Verification Process

4.1 General

The Contractor shall provide the documentation listed in Table A and Table B, for the purposes of:

- validating the technical suitability of the vessel for the activity
- identifying the vessel's configuration for the safest mode of operation
- understanding the vessel's station keeping capabilities following the worst case failure
- understanding the general level of compliance with:
 - IMCA M 103
 - IMCA M 185
 - IMO MSC Circular 645
 - relevant DP class requirements
 - any relevant mandatory standards and guidelines applicable in the particular Coastal State
 - IMO MSC Circular 738 (which refers to IMCA M 117 as an acceptable standard).

Project-specific requirements may be more stringent than the IMCA and IMO guidelines.

A formal submittal of the following shall be required as part of the Contractor's proposal. Documents specified in Table A shall be subjected to a review. The outcome of this review, along with the submittals specified in Table B, shall be used in audits.

The Affiliate or Project Group shall determine what documentation is required according to the intended duty and role of the Vessel.



4.2 Documentation For Detailed Review

Table A -Documentation for Detailed Review

No.	Document	Remarks
1	Vessel's Class Notation and Copy of Certificate	
2	FMEA of DP System	FMEA requirements in Section 3.1. FMEA shall have clear statement on Vessel's Safest Mode of Operation in DP (Power Generation/Power Distribution/Auxiliaries)
3	FMEA Proving Trials Results	Status of any actions arising from the trial to be verified.
4	DP Annual Trial Results	Status of any actions arising from the trial to be verified.
5	Power System discrimination and selectivity study, protective device calibration/testing documentation and vessel's bus tie philosophy	Power System Study shall be sufficiently detailed and provide a clear understanding of the safe mode configuration for the vessel. The Principal may accept closed bus tie operations if this Study shows this to be a safe mode. The Principal reserves the right to specify Open Bus for critical operations.
6	DP Capability Plots	Capability plots shall include the condition following worst-case failure. Capability plots should include current conditions of 1.0 knot, 1.5 knots and 2.0 knots.
7	Results of Capability proving tests for intact condition and worst case failure	Procedure in Appendix 1
8	Results of tests that show generators and thrusters can produce full power upon worst case failure	Procedure in Appendix 1
9	Philosophy for carrying out critical DP operations in proximity of sub sea or surface hazards	Includes methodology for risk assessments and contingency planning (examples to be provided)
10	Service reports concerning the DP system (last three years)	
11	Details of any DP related modifications since last FMEA	
12	Details of any acoustic noise tests conducted on the vessel	For determination of suitability of Acoustic Position Reference System
13	Audit Results (last three years) of Vessel and DP inspection	Include close-out reports



No.	Document	Remarks
14	DP Operations Manual	Vessel Specific DP Operations Manual, not the Manufacturer's DP manual
15	DP Incident reports (last three years) including close-out reports	Advisory, yellow alert and red alert levels
16	Details of spare capacity and interface for additional position reference sensors	
17	Details of Logging/Data Capture Capability	
18	Examples of Activity Specific Operational Guidelines or Well Specific Operational Guidelines that the vessel has used in the past	Example in Appendix 2
19	Details of Software QA methodology and modification management for key systems e.g. DP control system, power management system, variable frequency drives etc	
20	HPR Calibration report	
21	For vessels performing lifts on DP – details of DP control system proportional gains for fore/aft, port/starboard and heading along with description and settings for any heavy lift modes	Instability of the DP control system can be caused when the load is restrained by the setting guides. Procedures and or DP control system features need to be in place to avoid this.

Guidance Note 1 – when this General Specification is used for DP Drilling Vessels, the riser analysis will be required for detailed review.