

GENERAL SPECIFICATION

LOGISTICS AND OPERATIONAL SUPPORT

GS EP LSO 410

Manned Underwater Operations

Rev.	Date	Purpose of the revision
06	04/2018	Full review
05	05/2015	Organisation change (January 2015)
04	06/2014	Updated with clarification of requirements and Contractors' qualification, DP operations
03	09/2009	Revision & issue as LSO document (previously GS STR 461)
02	08/2007	Simplified and updated to cover the use of divers for surface, in-water operations.
01	11/2005	Addition of E&P root to GS identification
00	05/2004	Updated with implementation of IOGP code of practice

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1. Scope

The purpose of this document is to clearly identify Company requirements for the safe and efficient execution of Manned Underwater Operations.

The safety objectives for Manned Underwater Operations shall be achieved by ensuring compliance with Company rules, recognised industry standards and regulations, and the use of appropriate approved procedures.

This General Specification applies to all offshore, inshore and inland diving operations in all Company E&P Affiliates or Projects, either directly or indirectly contracted. It sets out the minimum requirements for diving operations to be carried out.

This General Specification, along with the [IOGP DRP 411](#), provides the requirements to be strictly applied by any Contractors providing diving services for all Company E&P Affiliates or Project. Diving operations, ROV in support of diving operations or surface swimming operations which are not in full compliance with the minimum standards described in this Company General Specification shall not be allowed to take place within Company Affiliates and Projects.

2. Reference documents

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

The reference documents listed below form an integral part of this General Specification.

Reference	Title
IMCA D 054/R 020	Remotely Operated Vehicle Intervention During Diving Operations
DMAC 15	Medical Equipment to be Held at the Site of an Offshore diving Operations
DMAC 28	The Provision of Emergency Medical Care for Divers in Saturation
IOGP DRP 411	International Association of Oil & Gas Producers
IOGP report # 431	Diving Recommended Practice
IMCA D 018	Diving worksite representative roles, responsibilities & training
IMCA D 023	The Initial and Periodic Examination, Testing and Certification of
IMCA D 024	Diving Plant and Equipment
IMCA D 037	DESIGN for Surface Orientated (Air) Diving
IMCA D 040	DESIGN for Saturation (bell) Diving Systems
IMCA R 004	DESIGN for Surface Supplied Mixed Gas Diving Systems
IMCA M 103	DESIGN for Mobile/Portable Surface Supplied Systems
	Marine Inspection for Small Workboats (Common Marine Inspection Document for Small Workboats)
	The Design and Operation of Dynamically Positioned Vessels

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Reference	Title
IMCA M 117	The Training and Experience of Key DP Personnel
IMO circ 738	Guidelines for Dynamic Positioning Systems (DP) Operator Training
IMCA M 149	Common Marine Inspection Document
IMO COLREG	Convention on the International Regulations for Preventing Collisions at Sea
HSE DVIS 9	Diver's breathing air standard and the frequency of examination and tests
BS EN 12021	Compressed air breathing quality

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP LSO 306	Selection and Operation of Dynamically Positioned Vessels

3. Definitions and acronyms

Item	Definition
Audit	An audit is defined as a methodical, detailed and complete examination and/or evaluation of a system or process to establish that they are acceptable or suitable for their intended purpose in conformity with established standards and guidelines. Diving System audits are standardized as IMCA DESIGN audits (IMCA D 023 , IMCA D 024 , IMCA D 037 and IMCA D 040) for each type of system. The Company normally does not audit diving systems. These IMCA DESIGN audits are performed depending on the complexity of the system either by the Contractor or by a third party. However, the Company performs checks and inspections.
Class	Status assigned to a diving system that has met the rules of an IACS classification society.
Closed bell	A Submersible Decompression Chamber (SDC) used for transferring divers under pressure to and from the underwater worksite.
Company	A Total E&P Affiliate, Project or other entity carrying out oil exploration and production activities on behalf of or for E&P. It does not include non-operated assets.
Contractor, Sub-Contractor, Operator	Any person or an organization who is directly involved in execution of prescribed work under a contract with the reporting to Company or Company representative.

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Item	Definition
Diving	Action of a person who enters either : - the water to perform underwater works or ; - an hyperbaric chamber and who will be subjected to a pressure greater than 0.1 bar above atmospheric pressure. Professional diving is performed using equipment that gives the diver capability to breathe air or other gas at a pressure greater than atmospheric pressure.
Diving Accident	Situation of a diver showing clinical symptoms while or subsequent to working under pressure. This definition regardless if dive profile and procedures have been respected or not, and regardless if the symptoms have disappeared after treatment or not. A man working underwater is exposed to different types of diving accidents, with different levels of gravity: desaturation type 1 and type 2, barotraumas, drowning, physiological reactions to gas toxicity, hypothermia, work related injuries.
Diving Incident	Situation of a diver submitted to a non-compliant dive profile or facing a significant down-graded situation due to an equipment failure, without clinical symptoms. Fast ascent, omission or non respect of decompression stops, non respect of the surface interval, diving spread failure or breathing gas anomaly are diving incidents.
Diving Contact Person (DCP)	Nominated cross-functional Diving Contact Person within the affiliate.
Diving Medical Specialist (DMS)	A doctor who is competent to manage the treatment of diving accidents, including, where appropriate, mixed gas and saturation diving accidents. Such a doctor will have passed specialized training and have demonstrated experience in this field.
Diving Specialist	A qualified professional diver and diving supervisor whose competence in a specific diving technique is recognized by E&P Head Office Underwater Operations Specialists.
Diving Support Vessel (DSV)	A surface watercraft, used to support the diving team and/or from which divers are deployed, in any offshore, inshore or inland diving operation. There are dedicated DSVs, especially designed for the purpose of diving operations, and DSVs "of opportunity".
Diving System	The whole plant and equipment for the conduct of diving operations.
Deficiency or Non-Conformity	A deficiency is an item or condition that is considered sub-standard or below minimum expectations, such as those mandated by either Company Rules, Specifications or drawings.
Derogation	Is the temporary and partial revocation of a Company Rule or General Specification.

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Item	Definition
<i>E&P Underwater Operations Specialist</i>	A person, assigned to Head Office DSO/IP/LSO/UWO, who by virtue of training, education, profession, publication or experience, has extensive knowledge or ability in the area and able to give sound advice or expertise in the global field of underwater operations.
<i>Equipment Certification</i>	A document that confirms that a particular test or examination has been carried out or witnessed at an identified time on a specific piece of equipment or system by a competent person.
<i>Medical examiner of divers</i>	A doctor who is trained and competent to perform the annual assessment of fitness to dive for divers. He may not possess knowledge of the treatment of diving accidents.
<i>Offshore site</i>	The term offshore site is a generic term that applies to a geographical location in which one or more offshore installations undertake oil & gas-related activities and designate any construction, floating or otherwise, designed and built to be installed at an offshore, coastal or inland waters site including oil and gas terminals.
<i>Saturation Diving</i>	The diving technique used during diving operations where the diver has reached the full physiological saturation state for the pressure and breathing mixture used. When this state has been reached, the time required for decompression is not further increased in relation to the duration of the dive. It requires a closed bell.
<i>SCUBA Diving</i>	Diving using a Self Contained Underwater Breathing Apparatus. Only Air & Nitrox open circuit breathing apparatus are considered by the company and this under very restrictive circumstances (Closed & semi-closed circuit re-breathers are not considered).
<i>Simultaneous Operations (SIMOPS)</i>	The simultaneous execution of two or more operations. A term used when two or more operations, such as, but not limited to, production, construction, heavy lift, diving, ROV, Marine are performed concurrently. Simultaneous operations generally have an impact on the installation safety procedures and contingency planning processes.
<i>Surface Supplied Diving</i>	Diving Operations that do not use a closed bell, regardless of the gas mixture used. It includes (1) Mobile Surface Supplied and (2) Surface Supplied techniques using Air or Nitrox; and (3) Wet Bell technique using mixed gas Heliox or Trimix.
<i>Surface swimming</i>	Action of a person who enters the water to perform in-water works and who will be subjected to a pressure less than 0.1 bar above atmospheric pressure.
<i>TUP or Bounce Diving</i>	A form of bell diving where the diver is exposed to pressure for an insufficient time for the dissolved gas in body tissues to reach saturation. It requires a closed bell.

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Item	Definition
Underwater Operations	Underwater Operations are those conducted by Divers, Remote Operated Vehicles (ROVs), Autonomous Underwater Vehicles (AUVs), Atmospheric Diving Suit (ADS) or Manned Submarine. Diving Operations are part of Underwater Operations.
Wet Bell	A diving basket with a closed top section which is capable of containing a dry gaseous atmosphere to provide a refuge for the divers. A supply of spare gas is carried on the Wet Bell. The Wet Bell is the technique used for Surface Supplied mixed gas Heliox & Trimix diving.
ADS	Atmospheric Diving Suit.
AODC	Association of Offshore Diving Contractors (predecessor to IMCA).
AUV	Autonomous Underwater Vehicle.
CDR	Company Diving Representative.
COLREG	Regulation to prevent Collision at sea.
CR	Company Rule.
DCP	Diving Competent Person.
DDC	Deck Decompression Chamber, also called hyperbaric chamber.
DESIGN	IMCA Diving Equipment Systems Inspection Guidance Note.
DMAC	The IMCA Diving Medical Advisory Committee.
DMS	Diving Medical Specialist.
DMT	Diver Medic Technician
DP	Dynamic Positioning.
DRSV	Diving & ROV Support Vessel.
DSV	Diving Support Vessel.
DSO/IP/LSO/UWO	E&P Underwater Operations (Head Quarter).
ERP	Emergency Response Plan/Procedure.
FMEA	Failure Mode Effect Analysis.
FMECA	Failure Mode and Criticality Analysis
FRC	Fast Rescue Craft.
GS	General Specification.
HAZID	Hazard Identification.
HELIOX	Helium & Oxygen mixture.
HRC, HLB, SPHL, HRU, HRF, HRV	Hyperbaric Rescue Chamber, Hyperbaric Life Boat, Self-Propelled Hyperbaric Lifeboat, Hyperbaric Rescue Unit, Hyperbaric Reception Facilities, Hyperbaric Rescue Vehicle
HSE	Health, Safety & Environment.
IACS	International Association of Classification Societies.

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Item	Definition
IMCA	International Maritime Contractors Association.
IMO	International Maritime Organization.
LSP	Life Support Package.
MOC	Management of Change.
NITROX	Nitrogen & Oxygen mixture.
IOGP	International Association of Oil & Gas Producers.
IOGP DRP	IOGP Diving Recommended Practice.
Pp	Partial pressure. PpO ₂ : oxygen partial pressure.
RA	Risk Assessment.
ROT	Remotely Operated Tool.
ROV	Remotely Operated Vehicle.
RSES-D	Responsible for Safety & Environment on Site – Delegate.
RSV	ROV Support Vessel.
SCUBA	Self Contained Underwater Breathing Apparatus.
SIMOPS	Simultaneous Operations.
SOLAS	Safety of Life at Sea.
TRIMIX	Helium, Nitrogen & Oxygen mixture.
TUP	Transfer Under Pressure.
UW	Underwater.

4. Compliance

The reference code of practice for the Company Diving Operations is the [IOGP DRP 411](#).

All IMCA (Marine/Diving/ROV/Survey divisions) current publications as per guidance, information notes, including those from AODC and DMAC, are integral to the [IOGP DRP 411](#).

This General Specification is based on the [IOGP DRP 411](#) and specifies additional requirements as deemed necessary by the Company.

Where conflicts arise between international or national requirements and this General Specification, the more stringent shall take precedence.

5. Basic requirements / Contractors' qualification

Contractors providing services for the Company shall be:

- Qualified by Company (audit process).
- Strictly complied with this General Specification.

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When the main Contractor is not the diving contractor or the direct employer of the divers, as qualification is part of the technical evaluation his responsibility is to ensure that prior to the signature of the main contract:

- The sub-contractors/operators are qualified by Company (audit process).

The Company Standards must be met by the sub-contractors/operators, regardless of the number of tiers in the contractual arrangements. All types of manned underwater operations shall be approved by DSO/IP/LSO/UWO.

A technical/operational qualification audit of the contractor is scheduled and performed by DSO/IP/LSO/UWO.

The average duration of this audit is two days and the qualification is valid for two years.

6. Minimum required DP Class levels for Underwater Operations

The Table 1 below shows the minimum IMO DP Class level required when conducting particular types of underwater 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.

All diving operations are to be considered critical activities and requires a proper and adequate DP status of the vessel, as per described in the [GS EP LSO 306](#). When diving operations are taking place from a Dynamic Positioning (DP) vessel, the taut wire (if available and depth permitted) has to be considered as one of the three minimum DP references.

DP Operators competence shall comply with IMCA requirements.

DSO/IP/LSO/UWO shall be consulted regarding the DP Class of Operation required for any watercraft for underwater operations not listed below.

Table 1 – IMO DP Class Requirements for Underwater Operations

Type of operation	Location	DP class of operation
Underwater operations where divers are required to be deployed inside an anchor pattern or to enter an enclosed or confined space e.g. Subsea manifold, wellhead, jackets or wreck.	World-wide	3
Diving Underwater operations	World-wide	2
Operation requiring vessel and/or ROV connected to Subsea System (crane, hot stab...)	World-wide	2
Vessel in ROV, ROT, AUV operations	Less than 500 m from an installation	2
Vessel in ROV, ROT, AUV operations	More than 500 m from an installation	1