

GENERAL SPECIFICATION

CIVIL WORKS

GS EP CIV 402

Design and construction of oil field laboratory on production installations

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General Specification		GS EP CIV 402
Design and construction of oil field laboratory on production installations		
Rev.: 04	Effective date: 05/2015	Page: 2 of 31

Contents

1. Scope	3
2. Reference documents	3
3. Definition of objectives	9
3.1 Health, safety and the environment	9
3.2 Service quality and level	9
3.3 Durability	9
4. Functional definition of structures	10
4.1 General requirements	10
4.2 Layout, links and proximity requirements	10
4.3 Type of laboratory	10
4.4 Integrated laboratory	11
4.5 Arrangement of the space	11
4.6 Special requirements	16
5. Technical design and execution requirements	16
5.1 General requirements	16
5.2 Passive fire protection	17
5.3 Function - Specific requirements	18
6. Maintenance, quality control procedures	24
6.1 Design	24
6.2 Construction	24
Appendix 1 Definition of minimum equipment characteristics and levels for an laboratory .	26

General Specification		GS EP CIV 402
Design and construction of oil field laboratory on production installations		
Rev.: 04	Effective date: 05/2015	Page: 3 of 31

1. Scope

The document defines the minimum requirements to be observed for the design, construction and installation of onshore and offshore oil and gas field laboratories (on platform, FPSO, FPU and central laboratory in subsidiary). This document isn't applicable to central group laboratory such as CSTJF and refineries.

Special requirements specific to each project (layout, climatic conditions, schedule, function, equipment, etc.) shall be covered by one or more job specifications. This Standard Specification shall not under any circumstances replace current regulations that supplement or amend it.

2. Reference documents

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

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.

Where there are national regulations, their particular requirements, and those of the standards or codes to which they refer, must be applied, supplementing or amending the provisions of this document.

If there are no mandatory national regulations, international regulations, standards and codes shall be applied.

If there are no applicable international standards and codes, the national codes and standards shall be applied, as selected from those listed below according to the cases in hand, which shall mandatorily be defined in the project's job specification.

In the absence of any particular specifications from the Owner, French national regulations shall be applied.

In the absence of a specific exemption, duly justified by the Contractor and agreed by the Owner, codes and standards of different origins may not be used in whole or in part.

If certain points in these regulations need to be clarified, the Contractor shall describe and justify the changes and/or additions to be made so that they can be adapted to the nature and environment of the structure. Such proposals shall be considered acceptable only when they have been examined and approved by the technical inspection authority appointed to verify the project, and agreed in writing by the Owner.

A definitive list of regulations, standards and codes proposed by the Contractors shall be taken from the reference documents defined in this specification and the project's job specification.

Only the main standards are mentioned, so the list is by no means exhaustive; the Contractor shall be responsible for compliance with any secondary standards and other standards dealing with the subject matter of this document.

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.

Reference	Title
API RP 2A-LRFD (1993.07)	Recommended Practise for planning, designing and constructing fixed offshore platforms
API RP 14G	Appendix F. Fire protection walls
AISC	American Institute of Steel Construction. Manual of steel construction
BUREAU VERITAS	Rules for the classification of offshore units (04.1997)
BS 476 (Parts 8;21)	Methods for determination of the fire resistance of loadbearing elements of construction
DTU - FA rules (09.1982)	Méthode de prévision par le calcul du comportement au feu des structures aciers (Method of predicting by calculation the behaviour of steel structures in fire)
DTU 60-11 (10.1988)	Règles de calcul des installations de plomberie sanitaire et d'évacuations des E.P (Rules for the design of plumbing installations for sanitation and rainwater drainage)
EEC	La sécurité et l'hygiène dans les industries d'extraction du pétrole et du gaz (Health and safety in oil and gas extraction industries) International symposium (04.1983)
IEC 60529	Degrees of protection provided by enclosures
IEC 60079-13 (1982)	Matériel électrique pour atmosphère explosive (Electrical equipment for explosive atmospheres)
ISO 1182	Non-combustibility
ISO 13819 Part 1 (1995)	General requirements. Fixed steel structures (superstructures)
ISO 15138	Petroleum and natural gas industries - Offshore production installations - Heating, ventilation and air-conditioning
ISO 15544	Petroleum and Natural Gas Industries - Offshore Production Installations - Requirements and Guidelines for Emergency Response
ISO 1716	Determination of calorific potential
ISO 3008	Fire resistance tests. Doors and shutter assemblies (A class)
ISO 3009	Fire resistance tests. Glazed elements
ISO 3864	Safety colours and safety signs
ISO 5657	Ignitability

Design and construction of oil field laboratory on production installations

Rev.: 04

Effective date: 05/2015

Page: 5 of 31

Reference	Title
ISO 6309	Fire protection; safety signs bilingual edition
ISO 834	Fire resistance tests. Elements of building construction (for Class A: standard curve; for Class H: HC curve)
ISO R 1996	Sound-proofing curves
ISO R 234	Courbe conventionnelle pour matérialiser l'action d'un feu type "bâtiment" (Standard curve for demonstrating the action of a "ship" type fire)
ISO 13702	Petroleum and natural gas industry. Control and mitigation of fire and explosions. Requirements and guidelines
ISO/DIS 834	Courbe de montée en température pour matérialiser l'action d'un feu "type hydrocarbure" (Temperature rise curve to demonstrate the action of a "hydrocarbon" type fire)
ISO/TR 14564	Shipbuilding and marine structures. Marking of escape routes
I.L.O	International Labour Office: Safety problems in the offshore petroleum industry (1 st ed., 1978) La sécurité et l'hygiène dans les entreprises internationales (1 st éd., 1985) (Health and safety in international businesses (1 st ed., 1985). Sécurité, hygiène du travail dans l'industrie pétrolière. Commission du Pétrole ("Health and safety at work in the petroleum industry. Petroleum Commission) (1973 session); Recommendations No. 105, 106, 142, 160, 171
ILO Convention No. 139	
ILO Convention No. 161	
IP 15	Institute of Petroleum. Model code of safe practise. Area classification for petroleum installations
IRCN 3.1 (24/36)	French Naval Construction Research Institute. Standards de qualité de construction des plates-formes et structures marines (1986) (Construction quality standards for marine platforms and structures (1986)
MARPOL 73/78 1st ed. 1991	International Convention for the Prevention of Pollution from Ships. Convention internationale pour la prévention de la pollution par les navires, including amendments up to May 1992. Appendix IV rule 8-9, Appendix V rules 1-3-4-5-6
SOLAS 1st ed. 1992	I.M.O (International Maritime Organization). Convention internationale pour la sauvegarde de la vie humaine en mer (International convention for the safety of human life at sea). Resolutions A124 - A270 - A414 - A515 - A649 - A564 - A754

Design and construction of oil field laboratory on production installations

Rev.: 04

Effective date: 05/2015

Page: 6 of 31

Reference	Title
SOLAS Res. A472	Méthode d'essais permettant le classement incombustible des matériaux de construction (Test method for classifying construction materials as non-combustible)
SOLAS Res. A471	Méthode d'essais permettant de déterminer la résistance à la flamme des textiles et voilages maintenus en position verticale (Test method for determining the flame resistance of textiles and netting held in a vertical position)
SOLAS Res. A517	Méthode d'essais au feu applicable aux cloisonnements de type ABF (Fire test method applicable to ABF type partitioning)
SOLAS Res. A652	Méthode d'essais au feu applicable aux meubles capitonnés (Fire test method applicable to quilted furniture)
SOLAS Res. A166	Evaluation des risques d'incendie présentés par les matériaux (Assessment of fire risks presented by materials)
SOLAS Res. A653	Méthode d'essais au feu pour matériaux de finition des cloisons, plafonds et ponts (Fire test method for partitions, ceiling and deck finishing materials)
SOLAS Res. A687	Méthode d'essais par inflammabilité des sous-couches de revêtements de ponts (Method of testing the non-combustibility of deck covering underlays)
MODU (Ed. 1992)	Code for the construction and equipment of mobile offshore drilling units. Chapters 5, 9
APSAD rules	
Act No. 93-1418	Construction code. Dated 31.12.93 concerning prevention and safety on civil engineering sites
Decree No. 94-1159	Construction code. Dated 26.12.94 concerning the coordination of safety on civil engineering sites
Art. L 231-1, L 231-2	Employment code. Hygiène, sécurité et conditions de travail (locaux de travail) (Health, safety and working conditions (workplace))
Art. R 232-1 to 13	Employment code. Hygiène des locaux affectés au travail et de leurs annexes (locaux de travail) (Hygiene in work and associated premises (working areas))
Art. R 235-1 to 9, R 241-41	Employment code. Règles d'hygiène (tous locaux) (Hygiene rules (all premises))
N.P.D.	Norwegian Petroleum Directorate. Acts, regulations and provisions for the petroleum activities (Vol. 1, 04.97)

Design and construction of oil field laboratory on production installations

Rev.: 04

Effective date: 05/2015

Page: 7 of 31

Reference	Title
W.H.O.	World Health Organization. Guidelines for drinking water quality (vol. 1-2) Décret royaux et ministériels, arrêtés gouvernementaux applicables aux installations pétrolières (Regulations stipulated by royal decree or ministry, applicable to persons and installations in the petroleum activities) • Safety (28.06.85) • Safety zones (09.10.87) • Medical requirements for persons (12.11.90) • Health service (12.11.90) • Hygiène (17.06.91) Offshore installations Operational safety, Health and Welfare Regulations (1976)

General Specification		GS EP CIV 402
Design and construction of oil field laboratory on production installations		
Rev.: 04	Effective date: 05/2015	Page: 8 of 31

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 CIV 202	Drainage and underground networks
GS EP CIV 300	Reinforced and prestressed concrete
GS EP CIV 301	Design of reinforced and prestressed concrete
GS EP CIV 401	Minimum requirements for building design and construction
GS EP CIV 405	Plumbing and sanitary for onshore and offshore installations
GS EP CIV 406	Thermal and acoustic insulation
GS EP CIV 500	Special Foundations For Onshore Structures
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP ELE 031	Design of earthing and bonding systems for Offshore Installations
GS EP ELE 051	Design and installation of lightning protection (cancelled document)
GS EP HVA 100	HVAC Basis of Design
GS EP INS 108	Instrumentation for the design of plant rooms and control rooms
GS EP SAF 221	Safety rules for buildings
GS EP SAF 021	Layout
GS EP SAF 228	Liquid drainage
GS EP SAF 253	Impacted area, restricted area and fire zones
GS EP SAF 341	Location and protection of onshore hydrocarbon storage
GS EP STR 102	Design of offshore topside structure
GS EP STR 901	Design rules and construction standards for ancillary structures of offshore installations
GS EP TEL 131	Marine radio links (cancelled document)
GS EP TEL 132	Air/ground radio links (cancelled document)
GS EP TEL 140	Public Address and General Alarm (PAGA)
GS EP TEL 150	Design, supply and installation of satellite telecommunication systems
GS EP TEL 160	Closed-Circuit Television (CCTV)
GS EP TEL 161	Network for Information, Communication and Entertainment (NICE)

General Specification		GS EP CIV 402
Design and construction of oil field laboratory on production installations		
Rev.: 04	Effective date: 05/2015	Page: 9 of 31

Reference	Title
GS EP TEL 170	Communications Network
GS EP TEL 180	Telecommunication network pre-cabling

3. Definition of objectives

3.1 Health, safety and the environment

3.1.1 Fire safety

All construction materials and elements shall offer fire resistance properties and reactions appropriate to the level of risk. But, in addition of requirements of the **GS EP SAF 221**, laboratory shall offer a fire résistance A120.

Compartments, fume extraction systems, gas and fire detection and alarm systems must comply with applicable regulations and standards.

Evacuation and firefighting resources must comply with all applicable regulations and standards.

3.1.2 Health and safety

The degree of toxicity of the materials used must be in accordance with the limits set by the applicable regulations.

Structures shall be executed in accordance with applicable practises in respect of protection against the risks of electrocution.

3.1.3 Environment

The provisions of **MARPOL IV** and **V** shall be applied.

3.2 Service quality and level

The Owner wants a construction that meets the quality criteria defined below:

- Internally, the premises must be correctly dimensioned and well aired; the shell of the living quarters and the air conditioning and ventilation system must provide year-round appropriate conditions of temperature and hygiene for personnel
- Internal finishings shall be of hotel standard without being excessively luxurious
- Technical solutions implemented must be simple, rational and functional, to facilitate both construction and maintenance.

3.3 Durability

Materials shall be chosen and implemented to ensure the durability of all elements, the deterioration of which would render the structure unsuitable for its intended use.

- Cleanliness, neatness and integrity of structural elements and their coatings
- Absence of moisture inside the premises

General Specification		GS EP CIV 402
Design and construction of oil field laboratory on production installations		
Rev.: 04	Effective date: 05/2015	Page: 10 of 31

- Absence of standing water on exposed structures
- Strength of suspended ceilings
- Strength of sealing systems
- Strength and effectiveness of seals.

4. Functional definition of structures

4.1 General requirements

The definition of the field laboratory shall depend on the nature and scale of production.

The dimensions of the laboratory shall vary according to the type, number and frequency of measurements and the complexity of the operations performed in the field.

The minimum laboratory areas specified in Appendix 1 have been calculated for a laboratory, including one workstation and dealing with the monitoring and control of output.. The equipment in Appendix 1 are design for a field of up to 50 wells and will be adapted to the field and the requirements of the plant.

4.2 Layout, links and proximity requirements

The laboratory shall always be located outside of areas of excessive vibration and production or storage areas in accordance with [GS EP SAF 221](#).

The laboratory shall be located in accordance with [GS EP SAF 021](#), and particularly with §5.6.3.

4.2.1 Offshore operation site

The laboratory may be located:

- In the area of the units, or
- In the accommodation area.

4.2.2 Onshore operating site

The laboratory should be located in not hazardous area.

4.3 Type of laboratory

4.3.1 Onshore base laboratory (central laboratory)

That type of laboratory gather together several rooms dedicated to oil, gas and water analyses

4.3.1.1 Laboratory room dedicated to oil analysis

Central Laboratory room dedicated to Oil and hydrocarbon analysis or on shore oil terminal laboratory.

The laboratory handles the following:

- Oil export quality measurement