

DEP SPECIFICATION

TELECOMMUNICATIONS FOR OFFSHORE FACILITIES

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DESIGN AND ENGINEERING PRACTICE

DEM1



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1. INTRODUCTION

1.1 SCOPE

This DEP specifies high level business and technical requirements and gives recommendations for telecommunication equipment and systems for offshore facilities.

For Shell operated facilities, the DEP is supplemented by the Field Telecom Technology Design Guide (TDG) and the Technical Engineering Guide (TEG), which provide more detailed technical design guidelines and configuration standards.

Telecommunications for onshore facilities is not covered in this DEP. Refer to DEP 32.71.00.10-Gen. which applies to onshore facilities.

Except for floating accommodation facilities with bridge connections to the main platform, telecommunication systems required during construction of a facility are not covered in this DEP.

This DEP contains mandatory requirements to mitigate process safety risks in accordance with Design Engineering Manual (DEM) 1 – Application of Technical Standards.

This DEP is a revision of the DEP with the same number, dated February 2015; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

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This DEP is intended for use in facilities related to offshore oil and gas production facilities. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases, the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The capitalised term **SHALL [PS]** indicates a process safety requirement.

The word **should** indicates a recommendation.

The word **may** indicates a permitted option.

1.3.2 Specific definitions

Term	Definition
A60 enclosure	Enclosure constructed from A60 firewalls.
A60 firewall	Barrier that provides A60-certified fire protection.
Access Control System	An access control system is a way of limiting access to a system or to physical or virtual resources. In computing
Automatic Identification and Data Capture	Automatic identification and data capture (AIDC) refers to the methods of automatically identifying objects, collecting data about them, and entering that data directly into computer systems (i.e. without human involvement). Technologies typically considered as part of AIDC include bar codes, Radio Frequency Identification (RFID),
Automatic Identification System	An automatic identification system (AIS) provides information on vessels at sea, which includes static information (such as ship's name, length, and type), dynamic information (ship's position, course, and speed), voyage-related information, and short safety information
Codec	A set of equipment that encodes an analogue speech or video signal into digital form for transmission purposes
Collaborative Work Environment	A generic high-end collaboration audio-visual (AV) room or a collection of integrated rooms/facilities which takes into account specific business collaboration requirements, principally focused on remote collaboration between two or more facilities. The purpose of a CWE is to enable implementation of business processes and workflows (e.g., production monitoring, exception based surveillance, scheduling remote team activities/jobs, coordination and planning of drilling and infrastructure activities, and general multi-point collaboration).
Collision Avoidance RADAR System	A collision avoidance RADAR system (CARS) allows operating personnel to identify and observe approaching ships and vessels and contact them by radio or other appropriate means when they are within an unsafe distance to the platform
Data Classification - Unrestricted	Information which may be shared without restrictions because consequential value erosion, financial loss, reputational damage, harm to any party, or breach of any law, regulation or agreement is not expected
Data Classification - Restricted	Information which may be shared with Staff, associated parties and selected other external parties but must not be shared with other external parties as to do so may result in value erosion, financial loss, reputational damage, harm to any party, or a breach of a law, regulation or agreement.
Data Classification - Confidential	Information which must be shared only with selected staff and selected external parties, because sharing with others may result in value erosion, financial loss, reputational damage, harm to any party, or a breach of a law, regulation or agreement.

Term	Definition
Data Classification – Most Confidential	Information which is extremely sensitive or extremely valuable and must be shared only with named individuals on a strict need-to-know basis because sharing with others could result in very serious value erosion, financial loss, reputational damage, harm to any party, or breach of a law, regulation or agreement. Inside information is Most Confidential.
Flotel	A flotel is a mobile stand-alone accommodation facility that is normally used to provide short or medium term accommodation. A flotel may be attached to a host platform or located within the field.
GI-D Infrastructure	GI-D infrastructure provides local area network connectivity for business users and computing resources to support optimal business operations. The infrastructure facilitates GI-D services and applications with access to corporate LAN and the Internet.
Hazardous area	Area in which an explosive gas atmosphere is or may be expected to be present in quantities to require special precautions for the construction, installation and use of electrical apparatus.
High Availability	High availability refers to systems that are durable and likely to operate continuously without failure for a long time. The term implies that parts of a system have been fully tested and, in many cases, that there are accommodations for failure in the form of redundant components. Availability may be measured relative to 100 % available.
Hotline	Refers to any mechanism in which a telephone call is automatically directed to a preselected destination without any additional action by the user.
Integrated early warning detection and surveillance system	An integrated early warning detection and surveillance system (IEWDSS) detects potential threats using a video surveillance system to monitor movements of any subject of interest and an independent and secured communication system to communicate with the shore base and authorities for assistance.
Manned platform/facility	Platform that is continuously occupied by persons accommodated and living thereon.
Mandatory/safety critical systems	Equipment required by international, national and local regulations. Also services that are defined and maintained to safety critical levels as defined in the facility safety case (and operating license). Mandatory/Safety Critical systems are supplied from the Vital power supply.
Marine Radar Transponder beacon	Marine radar transponder beacon (RACON) system provides information on the location of nearby vessels and hazards in relation to the offshore facility in all-weather or restricted visibility conditions.
Muster area	Normal place where personnel await evacuation from the platform.
Non-essential system	System that is neither mandatory/ safety critical, vital nor operational/essential.

Term	Definition
Non-hazardous area	Area in which an explosive gas atmosphere is not expected to be present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus.
Omnibus	Omnibus is an extension of a hotline service which allows multiple parties to connect into a common audio communication link. A user initiating an omnibus call will be able to alert a specific end point station or all end-point stations (via ring tone, flashing light or loud speaker) allowing any user to join to the call at any moment. In the event an existing dialogue is in place between two station a third station on lifting the handset will automatically be joined to the conversation immediately.
Operational/Essential systems	Systems which, in the event of failure (or reduced output), could lead to a widespread and/or prolonged shutdown of other systems within the facility or would have a significant impact on the operating efficiency of the facility.
Platform/facility	Offshore structure standing on the sea-bottom or a floating offshore facility that is anchored to the sea-bed.
Personnel Welfare	Worker welfare consists of a number of elements to support the needs of the individual worker, their relationship with their family and connections with their fellow workers.
Safety case	Case that is a demonstration that the hazards have been identified and assessed and under control and that the exposure of personnel to these hazards has been minimised. For offshore platforms an important feature is a demonstration that the arrangements are made for refuge and evacuation of personnel in the event of an emergency.
Sea area	Area of the sea in which the platform is located. Sea areas A1, A2, A3, and A4 are defined in the GMDSS amendments to the SOLAS convention.
Sea Wave monitoring system interface	A sea wave monitoring system interface system, or other equivalent wave monitoring technology/system, provides historic and real time information on surface wave parameters being encountered and provides interfaces between ARPA, AIS and Marine Information System (MIS).
Temporary refuge	Place where personnel can muster without undue risk while having access to the communications, monitoring and control equipment necessary to ensure their personal safety and from which, if necessary, safe and full evacuation can be effected.
Track and Trace	Provides a real-time locating system (RTLS) for capturing, storing, and making visible, sensor based location information about personnel, materials and equipment. The location information is obtained from fixed or mobile sensors/readers that respond to a tag (RFID, GPS, barcode) associated with a physical or logical entity (e.g., person, packaged material, piece of equipment, etc.). RTLS information is used in applications such as emergency response or on-site materials tracking that are built upon the RTLS (data acquisition) platform.

Term	Definition
Unmanned platform/facility	Platform/facility that has no living accommodation or quarters provided.
Vital services	Electrical supply provided to mandatory/safety critical and operationally essential systems.

1.3.3 Abbreviations

Term	Definition
3D	Three Dimension
ACL	Access Control List
AIDC	Automatic Identification and Data Capture
AIS	Automatic Identification System
AM	Amplitude Modulation
AMS	Access Management System
AP	Access Point
ARPA	Automatic Radar Plotting Aid
AV	Audio Video
BDA	Bi-Directional Amplifiers
BICSI	Building Industry Consulting Service International
CARS	Collision Avoidance Radar System
CCR	Central Control Room
CCTV	Closed Circuit Television
COR	Certificate of Recognition
CWE	Collaborative Work Environment
CS	Corporate Security
DGPS	Differential Global Positioning System
DHCP	Domain Host Configuration Protocol
DMR	Digital Microwave Radio
DMZ	Demilitarized Zone
DNS	Domain Name System



Term	Definition
DSC	Digital Selective Calling
DTRS	Digital Trunk Radio System
ECC	Emergency Control Centre
EM	Electromagnetic
EMF	Electro Magnetic Frequency
EOL	End of Life
EPIRB	Emergency Position Indicating Radio Beacon
EPR	Ethylene Propylene Rubber
ERT	Emergency Response Team
FM	Frequency Modulation
FPSO	Floating Production Storage and Offloading
Gbps	Gigabit Per Second
GI	Global Infrastructure
GI-D	Global Infrastructure - Desktop
GMDSS	Global Marine Distress and Safety System
GPS	Global Positioning System
HeC	High-end Collaboration
HF	High Frequency
HLO	Helicopter Landing Officer
HSSE	Health, Safety, Security and Environment
HVAC	Heating, Ventilation and Air Conditioning
Hz	Hertz
ICCS	Integrated Communication Console System
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDF	Intermediate Distribution Frame
IDS	Intruder Detection System
IEC	International Electrotechnical Commission

Term	Definition
IEEE	Institute of Electrical and Electronics Engineers
IEWDSS	Integrated Early Warning Detection and Surveillance System
iFAT	Integrated Factory Acceptance Test
IP	Internet Protocol
IP-##	International Protection Code (marking) for example, IP-54
IPT	IP Telephony
IPv4 / IPv6	IP version 4 / IP version 6
IRM	Information Risk Management
ISNetworld® RAVS®	ISN maintains safety, insurance, quality and regulatory information on Contractors and Suppliers Review and Verification Services
IS	Intrinsically Safe
ISDN	Integrated Service Digital Networks
ISPS	International Ship and Port-Facility Security
ITU	International Telecommunication Union
ITU-R	Radio Communications Sector of the ITU
ITU-T	Telecommunications Sector of the ITU
LAN	Local Access Network
LED	Light Emitting Diode
LOS	Line of Sight
LQ	Living Quarters
LSHF	Low Smoke Halogen Free
MDF	Main Distribution Frame
MGT	MICA Glass Tape
MODU	Mobile Offshore Drilling Unit
MPEG	Motion Picture Experts Group
NEC	National Electrical Code
NMEA	National Marine Electronics Association
NMS	Network Management System

Term	Definition
OCC	Operations Control Centre
OD	Office Domain
ONVIF	Open Network Video Interface Forum
PACO	Process Automation, Control, and Optimization
PAGA	Public Address and General Alarm
PC	Personal Computer
PCD-IT	Process Control Domain Information Technology
PoE	Power over Ethernet
PSTN	Public Switched Telephone Network
PTT	Push To Talk
PTZ	Pan, Tilt, Zoom
QoS	Quality of Service
RACON	RAdar beacON
RF	Radio Frequency
RFID	Radio Frequency Identification
RoIP	Radio over IP
RR	Radio Room
RTLS	Real-Time Locating System
SART	Search and Rescue Transponder
SAT	Site Acceptance Test
SBM	Single Buoy Mooring
SCADA	Supervisory Control and Data Acquisition
SCE	Safety Critical Elements
SCS	Structured Cabling System
SECOR	Small Employer Certificate of Recognition
SIP	Session Initiation Protocol
SNMP	Simple Network Management Protocol

Term	Definition
SOLAS	Safety of Life at Sea
SRA	Security Risk Assessment
SSAS	Ship Security Alert System
SSB	Single-Side Band
T&T	Track and Trace
TCP/IP	Transmission Control Protocol/Internet Protocol
TDG	Technology Design Guide
TEG	Technical Engineering Guide
TEMPSC	Totally Enclosed Motor Propelled Survival Craft
TER	Telecommunication Equipment Room
TETRA	Terrestrial Trunk Radio
TLP	Tension Leg Platform
TR	Temporary Refuge
UHF	Ultra High Frequency
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair
VCA	Video Content Analysis
VHF	Very High Frequency
VMD	Vehicle Motion Detection
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal (satellite system)
VSSS	Video Security Surveillance System
WAN	Wide Area Network
WiFi	Wireless Fidelity
WINS	Windows Internet Name Service
WLAN	Wireless LAN
WLC	Wireless LAN Controller



1.4 CROSS-REFERENCES

Where cross-references to other parts of this DEP are made, the referenced section or clause number is shown in brackets (). Other documents referenced by this DEP are listed in (14).

1.5 SUMMARY OF MAIN CHANGES

This DEP is a full revision of the DEP of the same number dated February 2015. The following are the main, non-editorial changes.

Section/Clause	Change
All	The term Mandatory changed to mandatory/safety critical. The term Operations changed to operational/essential.
All	Removal of duplicated requirement statements throughout.
All	Removal of text considered to be informative.
1	Added definition of High Availability, Codec, Flotel, AIDC, data classification, access control system, automatic identification and data capture, automatic identification system, collaborative work environment, collision avoidance RADAR system, high availability, Hotline, IEWDSS, marine radar transponder beacon, omnibus, sea wave monitoring system interface, track and trace.
1	Removed definition of process safety.
1	Added abbreviations for DHCP, DMZ, DNS, HEC, MPEG, ONVIF, ISNetworld, SCE, AIDC, RACON.
1	Removed abbreviations for 3G/4G, AMS, CCR, DEM, DEP and MOC.

1.6 COMMENTS ON THIS DEP

Comments on this DEP may be submitted to the Administrator using one of the following options:

Shell DEPs Online (Users with access to Shell DEPs Online)	Enter the Shell DEPs Online system at https://www.shelldeps.com Select a DEP and then go to the details screen for that DEP. Click on the "Give feedback" link, fill in the online form and submit.
DEP Feedback System (Users with access to Shell Wide Web)	Enter comments directly in the DEP Feedback System which is accessible from the Technical Standards Portal http://www.shell.com/standards . Select "Submit DEP Feedback", fill in the online form and submit.
DEP Standard Form (other users)	Use DEP Standard Form 00.00.05.80-Gen. to record feedback and email the form to the Administrator at standards@shell.com .

Feedback that has been registered in the DEP Feedback System by using one of the above options will be reviewed by the DEP Custodian for potential improvements to the DEP.

1.7 DUAL UNITS

This DEP contains both the International System (SI) units, as well as the corresponding US Customary (USC) units, which are given following the SI units in brackets. When agreed by the Principal, the indicated USC values/units may be used.

1.8 NON NORMATIVE TEXT (COMMENTARY)

Text shown in italic style in this DEP indicates text that is non-normative and is provided as explanation or background information only.

Non-normative text is normally indented slightly to the right of the relevant DEP clause.

1.9 OFFSHORE FACILITY TYPES**1.9.1 General**

There are four recognized offshore facility types (archetypes) as per Table 1 below:

Table 1 Offshore Facility Types

Production platforms with living quarters	Archetype 1
Floating vessels with living quarters	Archetype 2
Production platforms without living quarters	Archetype 3
Mobile drilling units with living quarters	Archetype 4

The typical telecommunication system requirements for each archetype are specified in Table 2.

Specific requirements will be defined by national and local regulations.

1.9.2 Offshore production platforms with living quarters (Archetype 1)

Production platforms with living quarters are anchored or moored in a fixed position, directly onto seabed. They include drilling, production, processing and export facilities and require permanent staffing for operational activities. Living quarters are necessary to accommodate the on-board staff, with safety systems to manage abandonment and rescue, along with communication systems for ships and helicopters. Such facilities are governed by safety case legislation.

1.9.3 Offshore floating vessels with living quarters (Archetype 2)

Floating vessels with living quarters (FPSO, FLNG) operate under Shipping Classification Society standards when under tow. Once they reach their final mooring position they are governed by safety case legislation. They typically require the same telecommunication systems as Archetype 1 facilities, with additional systems for navigation, security, and safety.

1.9.4 Offshore production platforms without living quarters (Archetype 3)

Production platforms without living quarters are small platforms which are remotely operated from onshore (or parent platform). They are anchored or moored in a fixed position, and are governed by safety case legislation.

Platforms without living quarters do not require telecommunication equipment for personnel evacuation/rescue. Instead temporary telecommunications equipment is provided when support or maintenance teams visit a platform.

1.9.5 Mobile offshore drilling units with living quarters (Archetype 4)

Mobile offshore drilling units (MODUs) operate under Shipping Classification Society standards. MODUs require SOLAS mandatory telecommunication systems and additional systems to facilitate navigation, security, and safety. MODUs also require systems for communication with ships and helicopters.

MODUs are normally owned by a drilling Contractor and operated under subcontract to the Principal.

Table 2 Typical Mandatory, Operational, and Non-essential Telecommunications for Offshore

Telecom System Class	Service Name	Offshore Archetypes			
		Archetype 1	Archetype 2	Archetype 3	Archetype 4
Mandatory	SOLAS survival craft communications	X	X	X	X ⁽³⁾
	Survival craft and Life raft communications (2.4.2.1)	X	X	X ⁽⁷⁾	X ⁽³⁾
	Marine beacons (RACON) (5.3.2)	X	X	X ⁽¹⁾	X ⁽³⁾
	Marine radio (5.3)	X	X	X ⁽¹⁾⁽²⁾	X ⁽³⁾
	Aviation radio and beacons (5.4)	X	X	X ⁽¹⁾	X ⁽³⁾
	Emergency communication facilities: Satellite phone (2.4.2.4), Onboard mobile UHF/VHF radio (2.4.2.6)	X	X		X ⁽³⁾
	Shipping systems (ARPA, AIS, IEWDSS, VSSS, independent radio communication system, independent access to external communication network, wave monitoring system, intercom system, gyrocompass, DGPS, VDR)		X		X
	PAGA	X	X	X	X
Operational	Voice and data network services	X ⁽⁶⁾	X	X ⁽⁴⁾	X ⁽⁵⁾
	Onboard radio communications	X ⁽⁶⁾	X		X ⁽⁵⁾
	CCTV	X ⁽⁶⁾	X	X ⁽⁴⁾	X ⁽⁵⁾
	Security systems	X ⁽⁶⁾	X	X ⁽⁴⁾	X ⁽⁵⁾
Non-essential	Welfare Internet and WiFi	X	X		X ⁽³⁾
	Public telephony	X	X		X ⁽³⁾
	Audio/video entertainment	X	X		X ⁽³⁾
NOTES 1. Applies only if the facility has a helideck. 2. Temporary marine radio systems are typically brought on board with day staff. 3. Responsibility of vessel operator 4. Require high availability wide area network and process control services, to support remote operations. Loss of telecommunication services, usually results in automatic shutdown for safety. All other normal operational services are optional, as specified by the Principal. 5. Operational telecommunications are split between the Principal and the vessel operator. a. Depending on size, the Principal often requires its own data network service to onshore/corporate network (via microwave or satellite). b. The vessel operator is responsible for its operational systems including voice and data network services, onboard radio communications, CCTV, security and other specialist systems. 6. Other specialist operational systems may be required by the Principal depending on the nature of the platform (e.g., pipeline and gas distribution, marine loading, etc.). 7. Particularly if no lifeboat is provided.					

2. GENERAL

2.1 SYSTEM CLASSIFICATION

2.1.1 Classification

1. Telecommunication systems for offshore facilities shall be classified as one of the following:
 - a. Mandatory/safety critical systems (2.1.2);
 - b. Operational/essential systems (2.1.3);
 - c. Non-essential telecommunications (2.1.4).

2.1.2 Mandatory/safety critical systems

Various mandatory/safety critical systems are used for communications under both normal and emergency conditions. These can be considered complementary to each other so that a number of options for communications are available at all times. Refer to (2.4).

The mandatory/safety critical systems to be provided are dependent on the type of facility, the lifesaving equipment and, the facility abandonment procedure.

1. Refer to DEP 32.30.20.11-Gen., section 9.7 for engineering design requirements for PAGA systems.
2. Mandatory/safety critical systems shall be designed and constructed to remain operational in emergency situations, as defined by the Principal.
3. The requirements for formal maintenance, inspection and testing of mandatory/safety critical systems shall be defined and handed over to operations, to enable assurance of the system availability during the operating phase.

Mandatory/safety critical telecommunications are typified by high availability and duplication of design to ensure high reliability with system monitoring to give an early indication of failure. Total loss of mandatory/safety critical systems can be a sufficient reason to shut down an offshore facility.

2.1.3 Operational/essential systems

Operational/essential telecommunication systems are provided to enhance efficiency of operation of offshore facilities. They are typified with high availability and reliability with system monitoring to give an early indication of potential failure. They are typically defined in the Business Continuity Plan.

Temporary loss of operational/essential systems is not, on its own, normally a reason to shut down an offshore facility.

Offshore operational telecommunication activities can include the following:

- *basic production and process control activities;*
- *crew communication and collaboration;*
- *logistics;*
- *administration;*
- *management and planning activities.*

2.1.4 Non-essential telecommunications

Non-essential telecommunications are provided in facilities that have living quarters (LQ) to provide personnel with communications to home, internet access and audio and video entertainment systems.

1. Non-essential telecommunications should include personnel welfare, recreation and non-essential administrative data systems (9).
2. Administrative data systems, such as video conferencing, should be deemed to be non-essential telecommunications.

2.2 USER REQUIREMENTS

1. User requirements shall be defined for each system.

Offshore facilities that are heavily integrated with other facilities, (e.g., gas gathering or distribution networks) can have additional user requirements that require advice from the Principal.

Such facilities may be designated by a local authority as National Critical Infrastructure that requires telecommunications systems are compliant with applicable national guidelines.

2.3 SYSTEMS REQUIRED

The following telecommunication systems or facilities are normally required for offshore facilities:

- *Shell wide area network (WAN) and third party Internet field backhaul connections;*
- *end point connectivity (LAN/wireless LAN);*
- *voice and telephony;*
- *onboard mobile radio system;*
- *emergency communication systems;*
- *CCTV system;*
- *security and intruder detection system;*
- *access control system;*
- *welfare and entertainment services, possibly including Internet and television;*
- *PAGA system, specified in DEP 32.30.20.11-Gen.*

The following special telecommunication systems might also be provided:

- *communication for marine loading terminal and facilities;*
- *communication for aircraft and helicopter operations;*
- *communication for gas gathering and/or gas distribution network;*
- *telecommunications systems outside the facility to cover requirements such as export pipelines;*
- *temporary telecommunications systems for local, national and international communications for construction or maintenance programmes;*
- *temporary telecommunications for periods of increase site activity such as campaign maintenance or turnaround.*

2.4 MANDATORY/SAFETY CRITICAL TELECOMMUNICATION SYSTEMS

2.4.1 General

1. Maritime Radio equipment which is deemed Mandatory / Safety Critical telecommunications equipment shall conform to the following:

- a. The latest Global Marine Distress and Safety System (GMDSS) performance standards as defined in the 1974 SOLAS convention as amended concerning radio communications;
- b. The latest amendments to the 1989 code for the construction and equipment of MODUs.

Maritime Radio equipment is deemed Mandatory / Safety Critical telecommunications equipment.

As per SOLAS regulations, the equipment required depends on the sea area where a facility is located.

Some Offshore production facilities are not directly comparable with a ship since most facilities will have a permanent means of communication with the shore which can be used to summon help in the event of an emergency.

2. Mandatory/safety critical systems shall be identified in development of the operational/essential safety case and comply with the operational/essential safety case (or equivalent) and local regulations.

2.4.2 On platform systems

2.4.2.1 Totally enclosed motor propelled survival craft (TEMPSC)

1. Each TEMPSC/lifeboat shall be equipped with the following:
 - a. IMO SOLAS and GMDSS compliant VHF-FM radio-telephone.
 - b. Search-and-rescue radar transponder (SART), operating in the 9 GHz marine radar frequency band.
 - c. Electronic position indicating rescue beacon (EPIRB) operating on the international satellite distress frequency of 406 MHz, subject to the existence of a national rescue service in operation.

2.4.2.2 Life rafts

1. If life rafts are provided, then each life raft shall be equipped in the same manner as TEMPSC (2.4.2.1), stowed on the facility where it can be easily placed in any life raft during an incident
2. The communication kit for life rafts should not be placed inside the life raft housing but adjacent to it.

2.4.2.3 Fast rescue craft

1. Fast rescue craft shall be fitted with a marine radio or radio-telephone.
 - a. SART or EPIRB should be provided.

2.4.2.4 Satellite telephones

1. Satellite telephones shall be provided as additional/alternate back up for emergency voice and data communication between an offshore facility and other locations including onshore locations, as specified in (4.6).

2.4.2.5 Navigation aids

1. See (10) when additional systems such as ARPA, DGPS, AIS, Sea Wave Monitoring System, and collision avoidance RADAR are required for self-propelled vessels, floating vessels with living quarters, TLPs, semi-submersible floating facilities, and if required by national regulations.
2. For permanent offshore fixed structures, including floating structures that are permanently moored or tendered, navigational aids shall comprise each of the following:
 - a. foghorns;

- b. white main and secondary marine lanterns;
 - c. radar beacons;
 - d. red subsidiary marine lanterns;
 - e. wave-off lights;
 - f. red obstruction lights;
 - g. helideck perimeter lights;
 - h. helideck floodlights;
 - i. illuminated windsocks.
3. Refer to DEP 33.80.00.30-Gen. for the design requirements for navigational aids for offshore fixed structures.

2.4.2.6 Onboard mobile radio system

1. An onboard mobile radio system shall be installed to enable safety and operational communications throughout the offshore facility.
2. Depending on the business requirement, the mobile radio system should be either non-trunked digital radio system or digital facility radio system, operating in the UHF or VHF radio band.
3. The following accessories for portable equipment should be included:
 - a. one spare battery;
 - b. a single insert battery charger;
 - c. a leather belt;
 - d. carrying case with a clip for the belt;
 - e. extended noise-cancelling microphone.

2.4.3 In-field systems

1. The following shall be defined as mandatory/safety critical In-Field systems:
 - a. Marine Radio System, refer to (5.2) and (5.3);
 - b. Marine RADAR Transponder beacon, refer to (5.3.2);
 - c. Aviation Radio Systems, refer to (5.4).

2.4.4 System testing and check-up inspection emergency equipment

1. Provision shall be made for regular testing of emergency/safety equipment.

2.5 HAZARDOUS AREA CONSIDERATIONS

1. To permit the selection of telecommunications equipment for areas where flammable gas or vapour risks may arise, relevant area classification drawing(s) shall be consulted.

Area classification drawings are prepared with reference to DEP 80.00.10.10-Gen. or DEP 80.00.10.13-Gen. for North America.

- a. Unless otherwise advised by the Principal, IEC 60079 or the equivalent local standard shall be used.

This includes electrical, optical and radio frequency protection.

2. Refer to DEP 33.64.10.10-Gen. (or DEP 33.64.20.10-Gen. for North America) for requirements related to electrical equipment protection in areas classified as hazardous.