



RP 59-3

TELECOMMUNICATIONS

SELECTION OF SHIPPING AND AERONAUTICAL COMMUNICATIONS FOR MANNED OFFSHORE FIXED INSTALLATIONS

October 1994

Copyright © The British Petroleum Company p.l.c.

All rights reserved. The information contained in this document is subject to the terms and conditions of the agreement or contract under which the document was supplied to the recipient's organisation. None of the information contained in this document shall be disclosed outside the recipient's own organisation without the prior written permission of Manager, Standards, BP International Limited, unless the terms of such agreement or contract expressly allow.

BP GROUP RECOMMENDED PRACTICES AND SPECIFICATIONS FOR ENGINEERING											
Doc. No. RP 59-3		Issue Date October 1994	Latest Amendment Date								
Document Title TELECOMMUNICATIONS SELECTION OF SHIPPING AND AERONAUTICAL COMMUNICATIONS FOR MANNED OFFSHORE FIXED INSTALLATIONS											
APPLICABILITY		Does not preclude adaption for other applications									
Regional Applicability:		United Kingdom									
SCOPE AND PURPOSE This Recommended Practice provides guidance for the design, selection and installation of Shipping and Aeronautical Telecommunications Systems for manned offshore fixed installations. Its purpose is to provide design engineers and management with:- (a) Guidance on the need and selection of shipping and aeronautical telecommunications systems for manned offshore fixed installations. (b) A basis for designing, specifying, evaluating and selecting shipping and aeronautical telecommunications systems for manned offshore fixed installations. (c) Guidance on health and safety aspects associated with the selection and operation of shipping and aeronautical telecommunications systems for manned offshore fixed installations.											
AMENDMENTS <table border="0" style="width: 100%;"> <tr> <td style="width: 15%;">Amd</td> <td style="width: 25%;">Date</td> <td style="width: 25%;">Page(s)</td> <td style="width: 35%;">Description</td> </tr> <tr> <td colspan="4"> </td> </tr> </table>				Amd	Date	Page(s)	Description				
Amd	Date	Page(s)	Description								
CUSTODIAN (See Quarterly Status List for Contact) Telecommunications											
Issued by:- Engineering Practices Group, BP International Limited, Research & Engineering Centre Chertsey Road, Sunbury-on-Thames, Middlesex, TW16 7LN, UNITED KINGDOM Tel: +44 1932 76 4067 Fax: +44 1932 76 4077 Telex: 296041											

CONTENTS

Section	Page
FOREWORD	i
1. SCOPE.....	1
2. EXPOSITION	1
2.1 Telecommunications	1
2.2 Telecommunications Systems.....	1
3. GENERAL REQUIREMENTS	2
3.1 Definition of Requirements	2
3.2 General Specification Requirements	3
4. AERONAUTICAL COMMUNICATIONS EQUIPMENT.....	5
4.1 LF/MF Non-Directional Radio Beacon (NDB) and Monitor Receiver	5
4.2 Fixed VHF/AM Aeronautical Radiotelephone	6
4.3 Handportable VHF/AM Aeronautical Radiotelephone.....	7
4.4 Lifeboat and Liferaft Emergency Position Indicating Radio Beacon (EPIRB)	8
4.5 Weather Monitoring System	9
5. MARINE COMMUNICATIONS EQUIPMENT	11
5.1 MF/HF SSB Radiotelephone.....	11
5.2 2182 kHz Watch Receiver	13
5.3 Weatherfax/NAVTEX Receivers	14
5.4 Fixed VHF/FM Marine Radiotelephone	15
5.5 Handportable VHF/FM Marine Radiotelephone	16
5.6 Crane VHF/FM Marine Radiotelephone.....	17
5.7 Lifeboat VHF/FM Radiotelephone	18
5.8 Inmarsat	19
5.9 Marine Radar Equipment.....	20
5.10 SOLAS Marine Radio Power Supply	21
6. RADIO CONSOLES.....	22
6.1 Console Design Requirements.....	22
6.2 Special Panels and Ancillary Requirements.....	23
6.3 Equipment in Radio Room Console	25
6.4 Equipment in Helicopter Landing Office Console.....	25
6.5 Equipment in Central Control Room Console.....	26
7. ANTENNAS AND FEEDERS	27
7.1 Antennas and Feeder Selection.....	27
7.2 Antenna Siting.....	28
8. PLANNING AND PROCUREMENT	28



9. OPERATION AND MAINTENANCE.....	31
FIGURE 1	33
TYPICAL SHIPPING AND AERONAUTICAL COMMUNICATIONS	33
SYSTEM BLOCK DIAGRAM	33
APPENDIX A.....	34
DEFINITIONS AND ABBREVIATIONS	34
APPENDIX B.....	36
LIST OF REFERENCED DOCUMENTS.....	36



FOREWORD

Introduction to BP Group Recommended Practices and Specifications for Engineering

The Introductory Volume contains a series of documents that provide an introduction to the BP Group Recommended Practices and Specifications for Engineering (RPSEs). In particular, the 'General Foreword' sets out the philosophy of the RPSEs. Other documents in the Introductory Volume provide general guidance on using the RPSEs and background information to Engineering Standards in BP. There are also recommendations for specific definitions and requirements.

Value of this Recommended Practice

There is currently no document which covers this requirement. Future applications will benefit from the ability to specify and procure such best-practice systems in a quicker and more cost effective manner. It is intended that this Recommended Practice will stimulate standard products to emerge and these will produce cost benefits compared with current bespoke systems.

Application

Text in *italics* is Commentary. Commentary provides background information which supports the requirements of the Recommended Practice, and may discuss alternative options. It also gives guidance on the implementation of any 'Specification' or 'Approval' actions; specific actions are indicated by an asterisk (*) preceding a paragraph number.

This document may refer to certain local, national or international regulations but the responsibility to ensure compliance with legislation and any other statutory requirements lies with the user. The user should adapt or supplement this document to ensure compliance for the specific application.

For further information contact Standards Group, BP International or the Custodian. See Quarterly Status List for contacts

Feedback and Further Information

Users are invited to feed back any comments and to detail experiences in the application of BP, to assist in the process of their continuous improvement.

For feedback and further information, please contact Standards Group, BP International or the Custodian. See Quarterly Status List for contacts.



1. SCOPE

This Recommended Practice provides a guide for the selection of shipping and aeronautical telecommunication systems used on manned offshore fixed installations, covering the types of services used for communicating and signalling with shipping and aircraft and the reasons for choosing the various methods. The Recommended Practice takes into account health and safety legislation, good design practice and the technical and economic considerations.

The following aspects are not covered by this Recommended Practice:-

- (a) Telecommunication Systems for Mobile Offshore Drilling Units.
- (b) Telecommunication Systems for unmanned or not normally manned offshore installations.
- (c) Telecommunication Systems for temporary offshore units for construction, hook-up or workovers.
- (d) Telecommunication Systems for onshore installations.

The purpose of this Recommended Practice is to provide design engineers and managers with a basis for the selection of shipping and aeronautical telecommunication systems for manned offshore fixed installations. This Recommended Practice is restricted in applicability to manned offshore fixed installations because the requirements for other types of offshore installation; offshore unit or onshore installation can vary in size, capacity and regulatory requirements.

2. EXPOSITION

2.1 Telecommunications

In terms which are generally accepted Telecommunications is defined as the transportation of voice, image, text or data between physically separated points. To achieve this function, electronic devices predominate, with either cable or radio connection being employed to implement the physical interconnections. However, other mediums such as optical technology is being used in an increasing number of applications, particularly in the field of optical fibre cables, infrared and laser.

2.2 Telecommunications Systems

Within the definition of this Recommended Practice a Telecommunication System is defined as a collection of individual items of equipment interconnected by means of transmission media to form a communication network. Such a network is used to provide the transmission path for any combination of voice, image, text or data communications.

Apart from shipping and aeronautical communications, which includes all the communication systems likely to be required from the offshore installation to



standby emergency support vessels, supply boats, mainland radio coast stations, coast guards, diving support vessels and helicopters, a number of other facilities and communication applications are used on existing offshore oil and gas fixed manned installations. These are generally divided into other categories as follows:-

- (1) Network Communications and Communication links (BP Group [RP 59-2](#))
- (2) Shipping and Aeronautical Communications (BP Group [RP 59-3](#))
- (3) On-Platform Communications (BP Group [RP 59-4](#))
- (4) Emergency Communications (BP Group [RP 59-5](#))
- (5) Telecommunication Power Supplies (BP Group [RP 59-6](#))

This Recommended Practice covers the requirements for shipping and aeronautical communication systems. The other categories are dealt with in other parts of the BP Group RP 59 series and will be referred to as and when required.

3. GENERAL REQUIREMENTS

3.1 Definition of Requirements

Shipping and aeronautical telecommunications would include all the communication systems likely to be required from the offshore installation to standby emergency support vessels, supply boats, mainland radio coast stations, coast guards, diving support vessels and helicopters. It would include some or all of the following:-

- (a) Mf/hf ssb international marine band radio telephone for communications with long range shipping and coast stations, (i.e. greater than about 30 miles).

In addition it may be necessary to install mf/hf radiotelephone equipment that satisfies [IMO SOLAS](#) regulations. However, this is not required in the UK sector of the North Sea.

- (b) Vhf international marine band radio telephones for communications with short range shipping (less than about 30 miles) and helicopters.
- (c) Vhf international aeronautical band radio telephones for communications with aircraft.
- (d) Marine radar for monitoring of shipping movements within the vicinity of the installation.
- (e) Weather monitoring equipment, used to advise installation personnel and helicopter pilots of existing and impending weather conditions around the installation.



The equipment used would normally be a combination of locally monitored sensors and radio reception of meteorological text and facsimile radio broadcasts.

- (f) Radio navigational direction beacon, for helicopters to locate the installation in bad weather.
- (g) Vhf and optionally hf international marine band radio telephones and emergency indicator radio beacons for lifeboats - used in an emergency for voice communications to rescue vessels and as radio locator beacons to aircraft.
- (h) An Inmarsat 'A' or 'B' radio satellite terminal may be required to provide back-up for any network communication systems.

See BP Group [RP 59-2](#) for further details.

The requirements for shipping and aeronautical communications have not fundamentally changed in the last twenty years and it is unlikely that they will in the next ten.

Technology is becoming more sophisticated to meet the same needs that existed twenty years ago, and there are many new developments available to make this form of communications more efficient and easy to use. The need for the skilled 'radio officer' however, is becoming less important.

NB: On normally manned installations there is still a requirement for radio operators to meet [MPT 105](#) qualification requirements.

Shipping and aeronautical communications feature strongly within the safety requirements for offshore installations, and this aspect is described further in BP Group [RP 59-5](#)

More use is being made of the network communication facilities for communications with shipping and helicopters via the public telephone national and international networks (e.g. most vessels now use Inmarsat). However, this is not seen as replacing the need for the maritime and aeronautical radio frequency bands. These will remain an essential feature of any offshore installation for everyday direct and immediate contact with supply boats for loadings and for helicopter movements.

3.2

General Specification Requirements

- (a) A radio room should preferably be allocated as the main location for the control and operation of any shipping and aeronautical radio equipment. This should be designated as the 'radio room'.

The equipment will be mainly installed in a radio room (RR) or in the central control room (CCR). If the RR is located so the radio operator's view of the helideck is obscured then some equipment may also be installed in the helicopter landing office (HLO). Any central equipment



cabinets that do not require operator control may be located in telecommunications equipment rooms. The telecommunication equipment rooms should be adjacent to the console room locations. Other locations of radio equipment may be: crane cabins, driller's office and offshore installation manager's office.

- (b) All radio communication equipment should meet the [ITU Radio Regulations](#), national regulatory requirements and should be type approved by the DTI Radiocommunications Agency or by the NTA or by the relevant national authority. All aeronautical communications equipment should meet Annex 10 of the ICAO recommendations on aeronautical communications. In addition, any company specific requirements or requirements set forth in this Recommended Practice and other relevant specifications or guidelines should be met.

Local regulatory requirements are prescribed in [SI 1019](#), [SI 486](#), [UKOOA](#) and in [NTA](#) (Norwegian Telecommunication Administration) regulations relating to the installation and use of maritime and aeronautical radiotelephone equipment on offshore production installations. A list of DTI MPT and ETSI European standards applicable to the equipment required is included in Appendix B.

- (c) Precautions should be taken to safeguard against the possible effects of rf causing induced ignition and hazards to personnel on the installation. All lf/mf/hf antenna tuning units should be housed in locked caged enclosures. Suitable non-ionising radiation warning signs should be mounted adjacent to all antennas.

Details on siting antennas are provided in section 7.0. of this Recommended Practice.

- (d) The following services should be included as required:-
- (i) Mf/hf ssb radiotelephone
 - (ii) Watch receiver
 - (iii) Weatherfax/Navtex receiver
 - (iv) Aeronautical non-directional beacon (NDB)
 - (v) Fixed and handportable vhf(am) aeronautical radiotelephones
 - (vi) Fixed and handportable vhf (fm) maritime radiotelephones
 - (vii) Crane vhf (fm) maritime radiotelephones
 - (viii) Lifeboat and life-raft radio equipment
 - (ix) Inmarsat
 - (x) Marine radar
 - (xi) Weather monitoring equipment



- (xii) Radio operators console (and any helicopter/ control room console)
- (xiii) SOLAS Radio Power Supply

4. AERONAUTICAL COMMUNICATIONS EQUIPMENT

4.1 LF/MF Non-Directional Radio Beacon (NDB) and Monitor Receiver

The installation should be equipped with a type approved non-directional radio beacon transmitter for use as a navigational aid to helicopter traffic. The operating frequency and call signal will be advised by appropriate regulatory authority. The equipment may be duplicated with automatic changeover to the stand-by transmitter if required. Remote control units should be fitted in the helicopter landing office console and the radio room console. The equipment should be powered from the ups supply.

A licence application must be made to the CAA or NTA giving full details of the location, proposed equipment type and name of the installation. A call signal and a radio frequency carrier will be allocated. The call signal allocated will be used as an identification code on the radio frequency carrier. This will be generated by a built-in code sender in the equipment which should operate between one and six times each minute. The radio frequency carrier should be continuously modulated by 400 Hz or 1020 Hz. The identity code signal used should be 2, 3 or 4 Morse coded letters transmitted at seven words per minute with evenly spaced periodicity of 10 seconds. The transmitter changeover and alarm should automatically occur if the carrier power falls by 3dB or the modulation level falls by 30% or the identify code transmission fails.

An NDB monitor receiver with its own independent antenna may be provided and fitted in the HLO console. The monitor receiver indicates when the NDB is being used and verifies that it is functioning satisfactorily.

Alternatively the HF SSB receiver described in section 5.1. of this Recommended Practice can be used to monitor the NDB.

The NDB should comply with the regulatory authority performance requirements and Annex 10 of the ICAO recommendations on aeronautical communications.

The performance of the NDB and monitor receiver should be in accordance with CAA specification [OP17](#). The equipment would only normally cover the frequency range between 255 to 620 kHz and although Annex 10 of the ICAO recommendations requests 200 to 1750 kHz most manufacturers cannot achieve this range in one type of equipment. An indication of which frequency band will be allocated should be obtained from the licensing authority before finalising the equipment type to be used. The modulation mode should be NON/H2A, and the output power would be approximately 100 watts full carrier



A top loaded omnidirectional ('capacitance hat') whip rosette antenna should preferably be used or alternatively a long-wire antenna may be fitted around the helideck when space is limited. There should be an antenna coupling unit mounted externally at the antenna base. This unit should be weatherproof (IP 54) and should include a vswr measuring circuit which would normally be used during commissioning and maintenance to simplify antenna tuning adjustments.

NDB antennas can be a continuous maintenance problem and antenna design should be given careful consideration. Top-loaded rosette antennas are prone to damage from crane movements, and a wire antenna is often fitted around the helideck when a top-loaded antenna cannot be safely located. However, the wire should use adequate insulators, be fixed securely and protected against corrosion. Insulated phosphor bronze aerial wire should be used. Regular antenna maintenance (e.g. six monthly) may be required and the wire antenna fixings used should be suitable so that the wire antenna can be easily cleaned or changed as necessary. A hinged/retractable type of fixing arrangement around the helideck for temporarily moving the antenna may be suitable. Whip antennas without any top loading are difficult to tune and standard antenna coupling units are often not stable enough to maintain the required vswr.

4.2

Fixed VHF/AM Aeronautical Radiotelephone

There should be two aeronautical vhf(am) radiotelephones. One of the radiotelephones should normally be mounted in the radio operator's console and powered from the ups power supply and the second should be mounted in the console in the helicopter landing office (HLO) and powered from a different ups power supply. The radio mounted in the helicopter landing office should normally be fitted with a remote unit in the helicopter reception office to enable the HLO operator to use the radio facilities from either location. In addition fully functional in service duplicate vhf(am) radios should be considered for each location so that operation is maintained during equipment malfunction or maintenance.

Two vhf am aeronautical radio transceivers are normally required to meet operational and safety requirements. It is often the case that the radio room is situated close to the control room on the lower decks of the installation and away from view of helicopter movements. Two radiotelephones are needed so that control room/radio room staff and helicopter logistics staff can listen and communicate with helicopters independently. In addition for safety reasons it is necessary during an emergency to be able to communicate with helicopters from two separate locations on the installation so that inadvertent damage to any one piece of equipment or location will not cause complete failure of vhf (am) communications to helicopters. See BP Group RP 59-5.

Each radiotelephone should comply with radio regulatory authority performance requirements and Annex 10 of the ICAO recommendations on aeronautical communications.

Basic performance specification should be in accordance with CAA specification [OP15](#). Each radiotelephone should cover the frequency range 118 to 137 MHz and all channels should be selectable over the range using a synthesised 25 kHz spacing. The modulation mode should be A3E (simplex) and a minimum output



power of 20 watt pep should be obtained. The receiver sensitivity should not be less than one microvolt for 10 dB SINAD for a one kHz modulation frequency with 30% depth of modulation.

Each transceiver radiotelephone and remote control unit should have a panel mounted built-in loudspeaker and a combined loudspeaker/microphone panel mounted handset with transmit key. The handset should mute the panel mounted loudspeaker when lifted off its cradle rest. Additionally a front panel socket for connection of a desk microphone with transmit key or headset with boom microphone and transmit key should be provided on each radio and/or remote control unit. Insertion of the headset with boom microphone into the socket should mute the inbuilt loudspeaker. A headset should be provided and panel mounted on the radio and/or remote control unit. A separate desk microphone with transmit key should also be provided for each radiotelephone and remote control unit. The desk microphone should be connected via the front panel socket and allow the desk microphone to substitute for the handset's microphone and transmit key when used. Use of the desk microphone transmit key should mute the transceiver's or remote control unit's panel mounted loudspeaker. Control functions on each radio or remote control unit should include volume control, channel selection and a squelch control allowing the operator a noise cancelling facility. Each radiotelephone should have a separate suitable omnidirectional antenna.

4.3 Handportable VHF/AM Aeronautical Radiotelephone

There should be a number of type approved vhf (am) handportable radiotelephones supplied for the installation. The handportable radio sets should be of rugged light weight construction equipped with an integral microphone and loudspeaker, squelch control, ptt-switch (press to talk), self-contained rechargeable battery and an outer carrying case that is fitted for attachment to an industrial belt.

Each handportable radio should be supplied with a second self-contained rechargeable battery, for use as a spare. The self-contained rechargeable batteries should be capable of being recharged without removal from the radio.

Each handportable radio should be supplied with and have adequate connections for a remote lapel type loudspeaker/microphone or a headset with integral noise-cancelling boom microphone. Headsets should be suitable for wearing with a hard hat and have facilities for hands free operation. All control knobs and switches should be suitable for operation by personnel wearing industrial gloves and all handportable radios should be suitable for heavy use and occasional drops from a height of 1.5 metres on to hard ground or metal. They should be weatherproof (IP 54) and resistive to sea water sprays, oil, mud and chemicals. Battery capacity should be sufficient for at least 8 hours normal use (90% standby - 10% transmit). The handportable radios should be suitable for use in close proximity to helicopters on deck with engines running.

Typically a quantity two or three are required.



Each handportable radio should comply with the radio regulatory authority performance requirements and Annex 10 of the ICAO recommendations on aeronautical communications.

Basic performance specification should be in accordance with CAA specification [OP15](#). Each radiotelephone should cover the frequency range 118 to 137 MHz and a minimum of three channels should be selectable over the range using a programmable synthesised 25 kHz spacing. The modulation mode should be A3E (simplex) and a maximum output power of 5 watts pep should be obtained. The receiver sensitivity should not be less than 0.5 microvolt for 6 dB SINAD for a one kHz modulation frequency with 30% depth of modulation.

The handportable radio sets including battery and together with any accessories such as remote speaker/microphone and headsets/boom microphone should preferably be certified intrinsically safe for use in Zone 1 hazardous areas. If this cannot be supplied the radio should be clearly labelled 'This radio is not suitable for use in hazardous area or flammable atmosphere'. For Norwegian installations the text 'Må ikke brukes i EX område' should also be added.

A suitable battery charger for each handportable radio should be available. This should be powered from the installation primary supply. The battery recharge time should be a minimum of one hour. Battery chargers should automatically discharge batteries before recharging. Battery capacity indications of both discharge and charged should be included.

4.4 Lifeboat and Liferaft Emergency Position Indicating Radio Beacon (EPIRB)

Each lifeboat and liferaft should be equipped with a type approved unsinkable EPIRB. The EPIRB should automatically transmit vhf and uhf radio signals on the aeronautical search and rescue frequencies to assist airborne location of the lifeboat/liferaft. The EPIRB should also transmit signals to the SARSAT (Search and Rescue Satellite Aided Tracking) satellite system.

The beacon should be self-contained and of a compact robust construction, watertight (IP 67), shockproof and resistant to corrosion. An omnidirectional antenna should be an integral part of the beacon. The beacon should have a self-contained high energy battery as its power supply. The battery should have a minimum operating endurance of 48 hours and a minimum storage life of 5 years. A battery isolator switch should be included to ensure safety against inadvertent operation when stored in the container. The EPIRB should be transportable and supplied with a quick release bracket for bulkhead mounting. Comprehensive operating instructions painted on rigid plastic (waterproof) should be supplied and mounted in a prominent position on the EPIRB. A full inbuilt electronic performance test facility should be provided. When not in use the EPIRB should be stored in a protective casing which should be suitable for bulkhead mounting in the lifeboat. Special lockers should be available for storing the EPIRB near the liferafts

Each EPIRB should meet the performance requirements of the radio regulatory authority and Annex 10 of the ICAO recommendations on aeronautical communications.

The EPIRB's basic performance should also be in accordance with DTI [MPT 1256](#) performance specification and Sarsat document D7. The EPIRB should transmit on 121.5, 243.0 and 406.025 MHz and should be approved by the Department of Trade and Industry. Modulation mode should be A9, AM, with a level greater than 85%. Transmitter power should be a minimum of 100 milliwatts pep using continuous transmission on each frequency.

4.5 Weather Monitoring System

A weather monitoring system should be provided to assist helicopter operations. The parameters to be measured and displayed should be:-

- (a) Time and date.
- (b) Gust and mean levels of wind speed, with the ability to change the measurement height reference to standard height, i.e. 10 m amsl or any other preferred height.
- (c) Gust and mean wind direction.
- (d) Mean air temperature.
- (e) Mean barometric air pressure.

Optionally, wave height may also be measured to display the period and the significant and maximum heights of waves, and the mean sea level relative to LAT. However, wave height measurement is more essential for floating installations.

Other parameters, i.e. visibility and cloudbase are normally recorded from visual observation by the helicopter operation staff. See [SI 1019](#), Part II, for further details.

The equipment should be powered from the ups power supply.

The weather monitoring system should be provided to assist helicopters but is also used to aid supply and safety vessel operations. The meteorological and oceanographical sensors should be mounted on the installation and the parameters displayed in the radio room and the helicopter landing office consoles, and possibly in the central control room console depending on operational requirements. The main processing equipment should be installed in a room close to the sensors, which tends to be located in the highest part of the installation adjacent to the helicopter landing office.

The meteorological sensors are normally mounted on the roof of the installation's accommodation module in order to avoid damage from crane movements and other moving structures. The sensors should be mounted in free circulating air. The wind sensor's location should take into account the effects of turbulence and should be mounted away from large surfaces that are likely to produce inaccurate readings of speed and direction. A minimum clearance of ten metres from any surfaces is recommended. The wave height sensor, if required would be mounted underneath the lowest part of the installation e.g. mounted under the cellar deck.

The weather system should provide all data necessary to meet CAA and ICAO recommendations. All sensors should be certified to operate in a Zone 1 hazardous area and be certified flameproof or intrinsically safe according to [BS 5501](#) and [BS 5345](#). All sensors should be suitably weather protected (IP 66) for installation in an salt laden atmospheric environment that is frequently laden with hydrocarbons, corrosive oil based mud that is used for drilling operations, rainfall, sea spray and sea water associated with hose down operations.

Generally, sensors should meet the following specifications:-

- (a) *Wind speed sensor should be a rotating cup generator type with its output frequency proportional to windspeed. The range should be 0 to 150 knots with accuracy of $\pm 3\%$.*
- (b) *Wind direction sensor should be a vane driven potentiometer type. The range should be 0 to 360° with accuracy of $\pm 3^\circ$.*
- (c) *Air temperature sensor should be a platinum resistance thermometer type. The range should be -10°C to + 40°C with accuracy of $\pm 0.2^\circ\text{C}$.*
- (d) *Barometric pressure sensor should be a capacitive capsule connected to the ambient pressure through an air pipe and terminated by a static pressure head. The range should be 800 to 1100 millibars with an accuracy of ± 0.6 millibars.*
- (e) *Wave sensor should be a radar type with a maximum beamwidth of 1 degree. The height range should be 0.3 to 50m with an accuracy of $\pm 1\%$. The minimum wave period measured should be 5 per second.*

Generally the processing equipment should meet the following specifications for displays:-

- (a) *Windspeed: A three digit readout should be displayed as either metres/second, miles/hour, knots or km/hour, and selectable as either instantaneous value, ten minute mean value or maximum three second gust in a ten minute period.*
- (b) *Wind direction: The readout should be selectable to thirty-two compass points or degrees.*
- (c) *Air Temperature: The readout should be a three digit display to the nearest tenth of a degree selectable between centigrade and fahrenheit.*
- (d) *Barometric Pressure: The readout should be a five digit display to the nearest tenth of a unit selectable to QFE in mb, QNH in mb, QNE in metres or QNE in feet.*
- (e) *Wave height: The readout should be a three digit display to the nearest tenth of a unit. The display should give simultaneous readings of*

significant wave height and maximum wave height selectable between feet or metres.

- (f) *Sea level: The readout should be a four digit display to nearest tenth of a unit showing the water level and selectable between feet or metres. The display should give an indication of level rising or falling and display the last maximum and minimum lengths.*
- (g) *Wave period and profile: The readout should be a three digit display in seconds to the nearest tenth of a second. The display should cover a ± 15 feet or a ± 5 metres wave profile dynamic display.*

A recording and data logging unit should be provided to record the meteorological data.

Normally two cassette or cartridge type tape outputs would be provided. Tape one would record the meteorological parameters at hourly intervals using the sample taken twenty minutes before the hour. Tape two would record raw data from the wave sensor every 24 hours and whenever the significant wave height exceeds an adjustable set limit. The recording units would normally be located with the main processing equipment. The tapes should have sufficient capacity to store the data for at least one month.

5. MARINE COMMUNICATIONS EQUIPMENT

5.1 MF/HF SSB Radiotelephone

There should be a main mf/hf ssb radio transceiver complete with antennas, antenna tuning unit, remote control unit and coaxial feeder cables installed on the installation for communication with coast stations, coast guards, support vessels and shipping on the international maritime distress frequency of 2182 kHz and the public correspondence frequencies

The installation of the equipment is not mandatory in the UK sector of the North Sea, however, there is no alternate means of communicating with long range vessels on the mf/hf bands and a minimum of one radiotelephone transceiver should be fitted for this purpose. In the Norwegian sector of the North sea, there may be a requirement to meet IMO SOLAS regulations (e.g. NTA requirements) and this equipment would then be mandatory. In which case the main transceiver may need to be powered from a dedicated power supply. There may also be a requirement for a standby mf/hf ssb transceiver with the same specification as the main except the latter can be powered from the standard installation supply. The mandatory standby transceiver may not be required if the geographical location of the installation is within vhf marine communication range of one of the coastal stations. In addition the standby may only be necessary if the main transceiver can not be used with other equipment, e.g. radiotelegraph/telex and a second dedicated transceiver is then required for practical reason to provide the telex facility. Local regulations must be verified at the start of each project to confirm the regulatory aspects for the installation of mf/hf radiotelephone units as these are constantly under review.



Statutory Instruments ([SI 1019](#)) require that effective communications should be maintained between the installation and "radio stations in the United Kingdom", The mf/hf radiotelephone is not ideal for this purpose and the network communication systems are preferred (see BP Group RP 59-2). However, installations equipped with an mf/hf transceiver can contact UK coast stations and therefore comply with the statutory requirements.

The equipment should be suitable for voice communication to coastal radio stations, voice communications to helicopters on mf/hf and voice communication on private frequencies to support vessels.

Frequencies for communication with helicopters are allocated by the national authority e.g. CAA.

d be located in the RR. However, the power amplifier may be housed elsewhere and remotely controlled from the RR. The antenna tuning unit (ATU) should be located near to the transmitting antenna and preferably in a sheltered area. Separate antennas for transmitter and receiver are required to allow for duplex operation. Both antennas should preferably be omnidirectional whip antennas greater than 7.5m in length, but wire antennas may be used where space permits. The receiver antenna should include a wideband matching unit to match the antenna to the 50 ohm coaxial feeder cable. The whip antennas should be fibre glass-coated, robustly constructed with all exposed metal being hot dip galvanised steel, bronze or stainless steel. The transmitter should have an integral two-tone automatic distress signal generator capable of transmitting the international distress signal. It should be possible to test the automatic distress transmission facility without actually broadcasting the signal. The antenna should be automatically earthed when the transmitter is de-energised or distress signal is being tested. If a standby transceiver is not installed then a reserve transmitter antenna should be stored on the installation. It is not necessary to install this reserve antenna.

All control functions of the transceiver should be located for simple use and operation.

All control functions of the transceiver including the hand microphone with transmit key, and a loudspeaker for the receiver are usually panel mounted and located in the radio operators console. Control functions usually include channel selection and volume control. A separate desk microphone with transmit key is preferred which can be connected to the transceiver via a socket and substitute for the hand microphone. Use of the hand or desk microphone transmit key should mute the transceiver's internal loudspeaker. A free running frequency synthesiser is preferred that can give easy access to all channels within the specified frequency range.

The mf/hf radiotelephone should be powered from the ups.

The mf/hf radiotelephone should meet the radio regulatory authority performance requirements.

Basic Performance requirements are:-

Regulatory performance specification:	DTI MPT 1224 and 1225
Frequency range TX:	1605 to 4000 kHz



Modulation modes:	H3E on 2182-kHz, R3E and J3E on other frequencies
Frequency range RX:	525 to 4200 kHz
Modulation modes:	A3E, H3E, R3E and J3E
Mode of operation:	Single or two frequency Simplex/Two frequency duplex
Transmitter output, all modes:	250 watt PEP

5.2 2182 kHz Watch Receiver

A watch receiver may be required in accordance with national regulatory requirements or IMO SOLAS recommendations.

A watch receiver is required to listen out on the international maritime distress frequency of 2182 kHz, and a 24 hour listening watch is required in accordance with IMO SOLAS regulations. However, the IMO SOLAS regulations are not applicable to manned offshore fixed installations in the UK sector of the North Sea and watch receivers are not required to be fitted on UK North Sea Installations. They may, however, be required in the Norwegian sector of the North Sea according to NTA requirements.

The watch receiver should be designed for continuous monitoring of the international calling and distress frequency of 2182 kHz and should be located in the radio operator's console and powered from the ups. The receiver should have an integral loudspeaker as well as an external loudspeaker output. The latter output may be used to drive a loudspeaker in CCR, which is required if the radio station is not to be manned continuously (i.e. 24 hours). The receiver should have both local and remote alarms. The performance of the receiver should be in accordance with the radio regulatory authority requirements and Article 41 of the ITU Radio Regulations.

Basic performance specification is as follows:-

Regulatory requirements	DTI MPT 1223
Frequency:	2182 kHz
Modes of operation:	R3E, J3E, A3E and H3E
Input sensitivity:	Better than 5 μ V for SINAD > 10 dB(at 1 kHz and 30% modulation)

A summary of the ITU radio regulations is as follows:-

The receiver should be capable of detecting and indicating separately the following alarm and warning signals:-

- (a) Radiotelephone Alarm signals consisting of two tones transmitted alternately i.e. 1300 Hz and 2200 Hz, the duration of each tone being 250 ms. This may be sent for up to one minute followed by a continuous 1300 Hz tone for ten seconds.
- (b) Navigational Warning Signal consisting of one tone 2200 Hz interrupted so that duration of tone and space are 250 ms each.

The receiver should have two operating modes: Normal and muted.



Normal mode: All signals are heard, i.e. speech communication as well as any two-tone distress signal in presence of background noise.

Muted mode: The loudspeaker is silent, but the receiver is open to the single tone and the two-tone distress signal. Reception of a distress signal should switch the receiver to Normal, permitting any voice message to be heard, as well as activate the appropriate alarm.

A built in clock should switch the receiver to Normal during the 3 minutes regulatory listening period, every half hour.

The receiver should have a dedicated antenna. It should be a fibre glass coated whip of more than 4m in length, robustly constructed with all exposed metal being hot-dip galvanised steel, bronze or stainless steel. The antenna cable should not be patched through any antenna patch panel.

5.3 Weatherfax/NAVTEX Receivers

In order to provide up-to-date weather information to the installation personnel a radio receiver can be installed that is capable of receiving all standard broadcasts transmitted by onshore meteorological stations e.g. from Bracknell in the UK.

Either a single radio receiver or two separate type approved weather information lf/mf/hf ssb radio receiver(s) should be installed which are capable of receiving meteorological/navigational text (NAVTEX) and facsimile (WMO) weather chart information from UK and continental meteorological stations. The receiver(s) should be located in the radio operators console and should be powered from the ups power supply.

The receiver(s) should have its (their) own antenna(s) robustly constructed with all exposed metal being galvanised steel, bronze or stainless steel.

If fitted it is desirable that the Weatherfax/NAVTEX receiver(s) should conform to the following requirements:-.

(a) Weatherfax

The weather facsimile receiver should receive weather broadcasts on all allocated frequencies in the 80-160 kHz and 2-25 MHz bands in accordance with CCIR recommendation 343, CCITT recommendation T.15 and WMO standards.

Weather maps and news are transmitted at regular schedules from facsimile stations and the equipment should be capable of pre-setting the start and end of each transmission manual. If a particular station/frequency provides WMO start/stop signals, then the reception of the transmissions should be automatically initiated by the reception of WMO start/stop signals. In this case the unit may be left unattended.



(b) NAVTEX

The NAVTEX receiver should receive navigational seven unit forward error correcting code broadcasts on 518 kHz in accordance with [CCIR recommendations 540 and 476](#)

NAVTEX is a navigational teleprinter in the format of narrow band direct printing. The information transmitted is normally used by ocean going vessels in accordance with SOLAS requirements. However, the data transmitted has proved useful for obtaining meteorological information that could affect the installation. The equipment should be capable of automatic reception and printing of all or required messages. An audible and visual alarm should be given by the equipment on receipt of urgent warnings.

5.4 Fixed VHF/FM Marine Radiotelephone

There should be a number of type approved maritime vhf(fm) radiotelephones on the installation. One of the radios should be mounted in the radio room (RR) console and powered from the ups power supply. A second vhf(fm) radio should be mounted in the console in the helicopter landing office (HLO), and a third in the central control room (CCR) console. Alternatively, the central control room may be fitted with a remote control unit which should operate all functions of the RR radio. The radio in the HLO should be powered from a different ups power supply. In addition fully functional in service duplicate vhf(fm) marine radios should be considered for each location so that operation is maintained during equipment malfunction or maintenance. If separate radios are provided for the RR and CCR then this arrangement may be considered adequate to safeguard against equipment failures during an emergency and duplicate radios may not be needed.

A minimum of two vhf fm marine radio transceivers are normally required to meet operational and safety requirements.. Two radiotelephones are needed so that control room/radio room staff and helicopter logistics staff can listen and communicate with vessels independently. In addition for safety reasons it is necessary during an emergency to be able to communicate with vessels and helicopters from two separate locations on the installation so that inadvertent damage to any one piece of equipment or location will not cause complete failure of vhf (fm) communications to shipping. See BP Group [RP 59-5](#).

If there is a separate emergency room on the installation this should also be fitted with a fixed vhf(fm) marine radio. Other locations may also be supplied with such radios e.g. drilling supervisors office and muster stations.

Lifeboat and crane cab vhf(fm) radios are dealt with in separate sections of this Recommended Practice.

Each radiotelephone should comply with radio regulatory authority performance requirements.



Basic performance specification should be in accordance with DTI [MPT 1251](#) and [1252](#) specifications. Other European ETSI standards are also available and are referred to in Appendix B of this Recommended Practice. Each radiotelephone should cover all the 55 international maritime frequency channels in the range 156 to 162 MHz and all channels should be selectable over the range using a synthesised 25 kHz spacing tuner. Any private channels allocated outside this band in the mobile radio band should also be selectable. The modulation mode should be F3E (simplex and duplex) and a minimum output power of 25 watts should be obtained which should be switchable to one watt. The receiver sensitivity should not be less than 0.5 microvolt for 12 dB SINAD for a one kHz modulation frequency with five kHz deviation. The channel spacing for private channels is 12.5 KHz and uses 2.5 kHz deviation.

Each vhf(fm) transceiver should have a dual watch facility, allowing for simultaneous watchkeeping on channel 16 and on any other selected channel.

Each transceiver radiotelephone and remote control unit usually has a panel mounted built-in loudspeaker and a combined loudspeaker/microphone panel mounted handset with transmit key. The handset should mute the panel mounted loudspeaker when lifted off its cradle rest. Additionally a front panel socket for connection of a desk microphone with transmit key or headset with boom microphone and transmit key are provided on each radio and/or remote control unit. Insertion of the headset with boom microphone into the socket mutes the inbuilt loudspeaker. A headset is often provided and panel mounted on the radio and/or remote control unit. A separate desk microphone with transmit key is normally provided for each radiotelephone and remote control unit. The desk microphone is usually connected via the front panel socket to allow the desk microphone to substitute for the handset's microphone and transmit key when used. Use of the desk microphone transmit key mutes the transceiver's or remote control unit's panel mounted loudspeaker. Control functions on each radio or remote control unit include volume control, channel selection and a squelch control allowing the operator a noise cancelling facility. Each radiotelephone is normally fitted with a separate suitable omnidirectional antenna.

5.5 Handportable VHF/FM Marine Radiotelephone

There should be a number of type approved vhf (fm) handportable radiotelephones supplied for the installation. The handportable radio sets should be of rugged light weight construction equipped with an integral microphone and loudspeaker, squelch control, ptt-switch (press to talk), self-contained rechargeable battery and an outer carrying case that is fitted for attachment to an industrial belt. Each handportable radio should be supplied with a second self-contained rechargeable battery, for use as a spare. The self-contained rechargeable batteries should be capable of being recharged without removal from the radio. Each handportable radio should be supplied with and have adequate connections for a remote lapel type loudspeaker/microphone or a headset with integral noise-cancelling boom microphone. Headsets should be suitable for wearing with a hard hat and have facilities for hands free operation. All control knobs and switches should be suitable for operation by personnel wearing industrial gloves and all handportable radios should be suitable for heavy use and occasional drops from a height of 1.5 metres on to hard ground or metal. They

should be weatherproof (IP 54) and resistive to sea water sprays, oil, mud and chemicals. Battery capacity should be sufficient for at least 8 hours normal use (90% standby - 10% transmit).

Typically a quantity ten or twelve are required for installation to ship communication, installation to lifeboat communication and emergency communication on channel 16 (156.8 MHz)

Each handportable radio should comply with radio regulatory authority performance requirements.

Basic performance specification should be in accordance with DTI [MPT 1251](#) and [1326](#) specifications. Other European ETSI standards are also available and are referred to in Appendix B of this Recommended Practice. Each handportable radio should cover the 55 international maritime frequency channels in the range 156 to 162 MHz and a minimum of six channels should be selectable over the range using a programmable synthesised 25 kHz spacing tuner. Any private channels allocated outside this band in the mobile radio band should also be selectable. One of the required channels is channel 16, the international emergency channel and the other channels should be single frequency simplex. The other frequencies should be international maritime inter-ship frequencies and as advised by the company. The modulation mode should be F3E (simplex and half duplex) and a maximum output power of 2 watts should be obtained. The receiver sensitivity should not be less than 0.35 microvolt for 12 dB SINAD for a one kHz modulation frequency with five kHz deviation.

The handportable radio sets including battery and together with any accessories such as remote speaker/microphone and headsets/boom microphone should be certified intrinsically safe for use in Zone 1 hazardous areas.

A suitable battery charger capable of charging all batteries simultaneously is required. This should be powered from the ups. The battery recharge time should be a minimum of one hour. Individual battery chargers for some of the handportable radios may also be needed. These should be powered from the installations primary supply. All battery chargers supplied should automatically discharge batteries before recharging. Battery capacity indications of both discharge and charged should be included.

5.6

Crane VHF/FM Marine Radiotelephone

Each crane cabin should be equipped with a robust semi-fixed vhf(fm) radiotelephone.

The radio installation can be designed so that any of the vhf(fm) handportable radios described above can be used in one of two plug-in receptacles. The plug-in receptacles should each be provided with means for charging the integral battery and for extending the operational facilities of the handportable radio.

This has the advantage of providing a partial intrinsically safe operation i.e. when the power on the installation is isolated due to a gas release, it will still be possible to communicate with personnel in the crane cabins using the hand portable radios removed from the plug in receptacle.



Press-to-talk switch, headphones, loudspeaker and microphone should be extended into a control/switch unit where either a vhf(fm) or a uhf(fm) radiotelephone can be selected. The radiotelephone combined vhf/uhf control unit installation should be equipped with a panel mounted swan neck microphone with press-to-talk switch and a loudspeaker. A squelch control should be included. In addition a headset with boom microphone should be available that is suitable for wearing with a hard hat. A foot switch or knee switch in the cabins control panel should be built in as an optional press-to-talk keying device for the radios. Design and operational use of the vhf(fm) marine crane radio should be harmonised with the uhf(fm) radio system.

The radio telephone should be used for crane to ship communication, emergency communication on channel 16 and crane to installation communication during loading operations of ships. General installation communication should operate in the uhf(fm) band. Details of the uhf handportable radio system are contained in BP Group [RP 59-4](#).

An omnidirectional antenna, located outside the crane's cabin may be required where radio coverage is expected to be limited. This should be extended to the radio installation as required.

The radio installation should be powered from the crane cabin supply and the units should be equipped with a suitable regulator or rectifier.

5.7

Lifeboat VHF/FM Radiotelephone

Each lifeboat should be fitted with a type approved permanently installed vhf(fm) radiotelephone. The transceiver should be suitable for operating in a high humidity environment and should be enclosed in a waterproof/watertight cabinet. The transceiver should operate from its own independent lifeboat battery. The lifeboat battery should be equipped with a suitable battery charger and have facilities to be charged from the lifeboat's electrical generator supply or be charged from the installation's single phase mains supply via a suitable plug and socket arrangement mounted on the lifeboat. The radio should have an external splashproof loudspeaker and be equipped with a watertight/waterproof headset and noise cancelling boom microphone with transmit key (press to talk). The loudspeaker should be suitable for fixing to the interior of the lifeboat. The radio should have a squelch control, volume control and channel selection switch. A dual watch facility should be included to allow watchkeeping on the emergency channel (No. 16) and any other channel. Each lifeboat radiotelephone should be equipped with a suitable omnidirectional marine grade vertically polarised antenna. Special antennas should be provided if the lifeboats are of the freefall type.

The type of antenna and the installation may need to be inspected and approved by the Department of Energy and the Health and Safety Executive.

Basic performance specification should be in accordance with DTI [MPT 1255](#). The frequency range should cover all the fifty five international marine channels and twenty private channels. The mode of operation should be F3E (simplex and half

duplex) and the transmitter power: should be twenty five watts with selection to reduce to one watt when required. The receiver sensitivity should be better than 0.5 microvolt for 12 dB SINAD using a one kHz modulation frequency for five kHz deviation. The radio should be environmentally protected to IP 56 according to BS 5345.

5.8

Inmarsat

An Inmarsat 'A' or 'B' terminal may be required to provide back-up communications for the network communication services that are installed on the installation. The terminal should satisfy the performance requirements of DTI [MPT 1260](#) specification and Inmarsat regulations for ship earth stations. The Inmarsat A terminal should be equipped for telephone and facsimile access into the PSTN and for telex facilities. Dual identity numbers should be fitted so individual dialling codes are available for the telephone and facsimile services. The terminal should have facilities for interconnection into the installation's telephone PABX system so the telephone facility can be accessed by telephone extensions off the PABX having the appropriate class of service allocation.

An Inmarsat terminal is rarely required to be fitted on an offshore manned fixed installation. The facilities provided by the network communication links are usually adequate (see BP Group [RP 59-2](#)). However, where back-up telecommunication routes are not provided for the essential emergency services to the shore an Inmarsat A terminal should be fitted to provide a back-up emergency communication link. If provided the system should be able to provide either a single speech channel or a single telex channel and be able to provide a channel of suitable quality to enable the transmission of [CCITT group 3 facsimile](#) ([CCITT T4](#)) or other data at 9.6 k bits/sec. Facsimile transmissions would be required for sending details of personnel movements to and from the installation.

Typical performance requirements are as follows:-

- (a) Frequency range: Transmit: 1636.5 to 1645.0 MHz; Receive: 1535.0 to 1543.5 MHz
- (b) Transmit EIRP: 36 dBw
- (c) Receive G/T figure of merit: -4dB/deg K
- (d) Channel spacing: 25 kHz
- (e) Antenna polarisation: right hand circular
- (f) Tracking: without gyro

The system should be provided with an emergency facility whereby the operation of a single red push button should cause the system to immediately call and provide a speech connection to an Inmarsat coast earth station (CES) for onward connection to the nearest rescue co-ordination centre (RCC).

The emergency calling facility should be provided for instances when the network communication link has failed or has been taken out of service for maintenance. It will not cover the situation when the installation is to be evacuated and main electrical power has been shut down. The Inmarsat terminal is not suitable for operation in hazardous areas and must be isolated from all sources of electrical power including the ups if there is a risk of gas escape.



The Inmarsat A terminal should be positioned and installed on the installation in accordance with the Inmarsat publication on ship earth station design and installation guidelines. The system is required to be available in an emergency and should therefore be powered from the ups.

The Inmarsat A terminal above decks equipment containing the radome protected parabolic dish should be suitable for mounting on a deck of the installation on a pedestal that is positioned at least one metre above the deck. This will normally be required in order to permit access to the radome for maintenance purposes. The above decks equipment will be remote from the below decks equipment and the Inmarsat type chosen should be adequately designed to accommodate the length of cabling required between the two locations. Typically a distance of 50 metres should be allowed. The below decks equipment consisting of the telex machine, VDU and facsimile machine should preferably be installed in the radio room where it can be accessed easily by authorised installation personnel.

5.9 Marine Radar Equipment

A marine radar system may be required to provide monitoring of shipping movements in the vicinity of the installation and to give warning of the development of potentially hazardous situations which could lead to damage being incurred by the installation structure or to subsea pipelines.

Normally the standby/safety boat that is positioned alongside the installation would have all the radar monitoring equipment necessary to ensure the installation's safety with respect to the early warning of approaching vessels. However, the installation may require its own radar system in order for installation personnel to periodically monitor the movements of vessels independently or to confirm the safety boats sightings.

The radar system should consist of central equipment located in a safe and two scanner/transceiver installations on opposite corners of the installation. A single control/display unit should be provided that is capable of switching to either scanner. The radar system central equipment and control/display unit should be powered from the ups. The scanner/transceivers should be fed from the installation main supply.

Two scanners are required so that 360 degrees coverage can be obtained. Operational controls and interactive interrogation should be possible from the display which would normally be fitted in the radio room. The display should have a series of selectable ranges suitable for daylight viewing. Preferably the transceiver should be combined into the scanner unit and mounted as one externally mounted unit.

Radar coverage should extend to at least 30 km from the installation. However, electromagnetic radiation from the scanner/transceivers should be sectorised so that radio frequency radiation is not emitted towards the installation.

For protection of personnel and other equipment the radar scanners should be designed so that the transceivers are prevented from transmitting rf power when the



scanner is pointing into the installation. The sectoring should be adjustable and achieved electronically.

The radar system should comply with the performance standards of the IMO and DOT for navigational equipment. The scanner/transceiver unit should be suitably weather protected (IP 65) for installation in an salt laden atmospheric environment that is frequently laden with hydrocarbons, rainfall, sea spray and sea water associated with hose down operations.

Performance standards for marine radar installations are described in SI 1203 navigational equipment regulations. However, ARPA facilities are not required. Generally the following minimum facilities should be provided:-

- (a) Frequency band: 10 cm (3040 to 3060 MHz)
- (b) Output power: 30 kW
- (c) Range: Minimum of 30m; accuracy of 1 % of range used.
- (d) Bearing: Minimum increments of 1 degree; accuracy ± 1 degree
- (e) Display: 20 inch, colour

5.10 SOLAS Marine Radio Power Supply

The Safety of Life at Sea (SOLAS) regulation requires that a marine radio power system should be provided solely for the telecommunication radio equipment, so that in the event of main electrical power failure on an offshore installation the essential radio communications equipment can continue to operate. This should consist of accumulator batteries charged from the installation's electrical system. The batteries should be put into operation rapidly and capable of operating the radio communications equipment continuously for a period of six hours under normal operating conditions.

This regulation is applicable to some offshore installations. It is not a requirement for the UK sector of the North Sea, and other regulations as stated in the Statutory Instruments covering standby power supplies are more applicable. However, Norwegian authorities may require SOLAS recommendations to be met for the Norwegian sector of the North Sea. For details of requirements for telecommunication power supplies on manned offshore fixed installations see BP Group [RP 59-6](#).

The power supply should comprise a modular charger, a single battery bank and any necessary monitoring instruments and alarm equipment. Electrical contactors should be included in the dc output cables for safety isolation purposes

The accumulator batteries must have sufficient capacity to operate the equipment simultaneously for at least 6 consecutive hours and the minimum load capacity can usually be determined from the addition of the following:-

- (a) Half the MF/HF SSB transmitter's current consumption during peak modulation.
- (b) Half the MF/HF SSB transmitter's current in the 'transmit' position (unkeyed).



- (c) The current consumption of the MF/HF SSB receiver(s) .
- (d) The current consumption of the watch receiver.
- (e) Half the current consumption of one VHF/FM maritime transceiver during transmission.
- (f) The current consumption of the emergency light in the radio room.

No equipment other than the above mentioned is allowed to be connected to the battery. The battery voltage is to be kept within $\pm 10\%$ of nominal voltage. A battery capacity of 300 Ah is normally adequate to supply a 400 watt mf/hf ssb radiotelephone and a 25 watt vhf(fm) radiotelephone for six hours.

The batteries should be located in a dedicated battery room close to the radio room equipment. An ampere meter for reading the charging current should be located in radio room. The rectifier/charger may be located in the radio room.

6. RADIO CONSOLES

6.1 Console Design Requirements

Where required, each console should be arranged so that all controls are easily accessible to the operator from a sitting position with full leg-room available along the bottom length of the console body. Each console should be provided with a work-space in front of the console body and separately positioned from any controls or indicators to enable the operators to carry out their various administrative duties. The console work top section should be overlaid with a hinged and transparent armoured glass cover for the display of equipment licences and other documents associated with the operation of the radio equipment in the console(s). Each console should be provided with drawers and shelves for storage purposes. As a minimum requirement the work top section should be provided with integral drawer units. Book shelf space should be provided for storing essential radio reference documents and log books.

For guidance the leg-room depth available from the edge of the table top to the console panels should be a minimum of 48 cm and a greater depth at the floor i.e. inner sloping structure, with the table top having a height of 75 cm from the floor. Equipment frequently operated should be located such that the operating buttons/controls are below shoulder height when seated. Equipment should be arranged so that any sideways movement for the operator is minimised. The console panel face should be suitably inclined so that the operator does not experience light glare or reflection from the panel face. The console panel face should preferably have an downward sloping surface from the top of the console towards the edge of the desktop for ease of operation. This sloping part should house all equipment which need to be operated with an allowance for a minimum of 20 percent extra space for future needs. An upward sloping section may be placed on the top of the console where all recording and display only equipment (no control functions) should be located. However, the maximum height of the console should not obstruct any view that may be specified required.(e.g. of the helipad)



When fitted, the consoles should be provided with front equipment access and be suitable for bottom cable entry. Each console should be a suitable size for access and installation in the rooms provided and should have facilities for easy dismantling and assembly. Allowance should be made for external cables entering the console, different types of internal cabling, power supply wiring, earthing and maintenance facilities.

The consoles should be fabricated as standard EIA 19 inch straight bays or sections, manufactured to accommodate standard EIA 19 inch removable equipment panels. Corner sections should be available if the geometry of the room calls for this. The individual bays should be fully wired and assembled as separate units, and designed for ease of assembly using quick release electrical and mechanical connections. Plugs and sockets should be used for inter bay wiring. Readily accessible cable termination strips will be required in the lower section of each console with access available from the front via hinged doors equipped with locks. Adequate space and terminal rails should be provided to accommodate a fully equipped console and cables. This should consider that the external cables will be large, i.e. armoured, screened, flame retardant or fire resistant. The bays should also accept equipment not designed for standard EIA 19 inch rack mounting. The lower part of each console should mainly be used for auxiliary equipment needing only occasional service or maintenance. Each console bay should be supplied with suitable lifting lugs.

All internal cabling should be arranged so that the cables associated with the various electrical services and radio communication functions are provided on individual terminal units that are suitably labelled and identified, and adequately separated and segregated from each other. Cable terminals should be of SAK 2.5 type or similar i.e. rail-mounted modular type. Power supply distribution and isolation facilities should be provided in an accessible area in the base of the consoles for the distribution of incoming power to the individual equipment units. For the purpose of chassis bonding, the consoles should be provided with M12 threaded brass bolts brazed on to the main framework or near the base on the inside of the console.

For maintenance purposes the internal bottom sections of each console bay should be equipped with light fittings controlled via door operated switches. In addition various mains power outlets are required on the console for use by telecommunication maintenance personnel. These outlets should be fed via a separate power and preferably be the CEE 22/IEC type. Equipment runners or slides should be included for all equipment mounted on the console to facilitate easy installation and maintenance.

6.2

Special Panels and Ancillary Requirements

Various ancillary items associated with the aeronautical and shipping communication systems may be required to be fitted in the consoles as follows:-

- (a) Remote Alarm Panel



There may be a requirement for an alarm panel to display the various types of communication equipment failures. This should be suitable for mounting in the radio operators console.

The alarm panel should consist of a series of alarm lights, each suitably labelled to indicate the particular external alarm condition. A general (e.g. red lamp) alarm and sounding unit would normally be fitted to indicate a common alarm (i.e. all alarms OR'ed). An acknowledge push-button would also be fitted. A typical quantity of 30 lamps would be required. A lamp test facility should be included.

(b) Antenna Patch Panels

An antenna patch panel may be required to be installed in the radio room console. It should be suitable for manual patching of any main and spare antennas for the any of the mf/hf or vhf services mounted in the console

In addition, antenna connection boards or antenna patch panels may be required in the vicinity of each antenna area. These panels may ease maintenance requirements when antennas or antenna feeders require changing. The panels may also ease hook-up work during construction of the installation.

(c) Phone Patch and Telephone Exchange Interface Unit

An audio phone patch and telephone extension line interference unit may be required for installation in the radio room console. This unit should allow cross patching so that any of the various radiotelephone equipment can be accessed by any telephone extension. The connection could be set up manually or automatically through the installation PABX.

Facilities are normally provided so any of the following equipment could be 'patched' to a telephone extension:-

- (i) mf/hf ssb radiotelephones
- (ii) vhf (fm) maritime radiotelephone
- (iii) on-platform uhf handportable radio system.

(d) Radio Operators Clock

In the radio room console there should be a reliable analog clock. On the clock face, the radio silence periods prescribed for radio telephone services should be marked in blue. It should operate on an integral battery.

This is required so that the radio silence periods can be observed when transmitting on the 2182 kHz mf radiotelephone frequency.



6.3

Equipment in Radio Room Console

There should be a radio console fitted into the radio room on the installation in accordance with [SI 1019](#). The console should house most of the radio equipment dealt with in this Recommended Practice. In addition some control units for on-platform communications are housed in this console. Some special control panels may also be fitted.

The use of a radio operator on an offshore fixed manned installation is becoming less of a requirement and radio operating licences are being issued to installation management staff where the equipment being used does not require any detailed specialised knowledge of radio communications. This is possible with certain modern equipment where the operating functions have been simplified. However, the requirement to house and gain easy access to all the various control panels for the telecommunication systems on the installation remains and the radio room console is required for this purpose. (see [SI 1019](#)).

The following items should be located in the radio room console:-

- (a) Mf/hf ssb radiotelephone control unit
- (b) The watch receiver (as required)
- (c) Weatherfax/NATEX receiver (as required)
- (d) Vhf (fm) maritime radiotelephone (may be duplicated)
- (e) Vhf (am) aeronautical radiotelephone (may be duplicated)
- (f) NDB (non-directional beacon) control unit and monitor receiver indicator
- (g) Weather monitoring system display
- (h) Radio operator's clock
- (i) Emergency lights

The following equipment should preferably be installed in the radio room console, but may be located elsewhere:-

- (a) Uhf handportable radio system control unit
- (b) Radio paging control unit
- (c) Muster station intercom set
- (d) PA control unit
- (e) Extension telephone sets and telephone operators console
- (f) Radar system display (as required)
- (g) Hand/headsets /microphones and loudspeakers for other voice systems e.g. hotline telephone

See BP Group [RP 59-4](#) and BP Group [RP 59-2](#) for details of the above.

6.4

Equipment in Helicopter Landing Office Console

There may be a radio console fitted into the helicopter landing office on the installation in accordance with [SI 1019](#). The console would house some of the radio equipment dealt with in this Recommended Practice and some control units for on-platform communications.

In accordance with [SI 1019](#) the operator of the radiotelephone equipment must preferably have full view of any helicopter landing area when communicating with the helicopter pilot. The helicopter landing office would therefore require a



console to house the equipment and provide facilities for easy access and operation of the equipment.

The following items would normally be located in the helicopter landing office console:-

- (a) Vhf (fm) maritime radiotelephone (may be duplicated)
- (b) Vhf (am) aeronautical radiotelephone (may be duplicated)
- (c) NDB (non-directional beacon) control unit and monitor receiver indicator
- (d) Weather monitoring system display
- (e) Emergency lights

The following equipment may also be installed in the helicopter landing office console:-

- (a) Muster station intercom set
- (b) PA control unit
- (c) Extension telephone sets
- (d) Hand/headsets /microphones and loudspeakers for other voice systems e.g. hotline telephone

See BP Group [RP 59-2](#) and BP Group [RP 59-4](#) for further details of requirements for on-platform and network communication systems

6.5 Equipment in Central Control Room Console

There may be a radio console fitted into the central control room on the installation. The console would house some of the radio equipment dealt with in this Recommended Practice and some control units for on-platform communications.

The requirement for communication facilities in the central control room is mainly for operational purposes associated with the monitoring and control of the various instrumentation and control systems on the installation. In addition, during incidents of fire or gas detection on the installation, the control room is used as the centre of communications and control. The radio room console may be located adjacent to the control room, however, the facilities provided in the radio room would tend to cover the communication facilities that are more associated with long range communication with vessels and weather monitoring. The control room console and the radio room console provide back-up facilities for the essential emergency communication services required.

The following items may be located in the central control room console:-

- (a) Vhf (fm) maritime radiotelephone remote control unit (may be duplicated)
- (b) Weather monitoring system display
- (c) Emergency lights

The following equipment may also be installed in the central control room console:

- (a) Uhf handportable radio system control unit
- (b) Radio paging control unit
- (c) Muster station intercom set
- (d) PA control unit



- (e) Extension telephone sets
- (f) Hand/headsets /microphones and loudspeakers for other voice systems e.g. hotline telephone

See BP Group [RP 59-2](#) and BP Group [RP 59-4](#) for details of the network and on-platform communication systems.

The central control room console metalwork frame, panels and associated wiring termination facilities would normally be supplied by the vendor for the DCS or SCADA system and two or three bays would usually be allocated for communications equipment. The empty bays would then be free issued to the communication system vendor for fitting of the communications equipment. The requirement for communications equipment in the central control room console should be decided early so the sizing arrangements can be made before orders are placed with the control system vendor.

7. ANTENNAS AND FEEDERS

7.1 Antennas and Feeder Selection

Antennas and feeders should be selected according to the service they are intended. All antennas for marine and aeronautical communications equipment should be omnidirectional. Antenna feeders should comply with [BS 2316](#) and [IEC 96](#).

There are no generally accepted national or international standards for lf, mf/hf or vhf omnidirectional marine and aeronautical antennas. Antenna performance requirements are often included with the specification for the radio equipment and each manufactures type is approved individually by the radio regulatory authority. Details of design and installation requirements for antennas are covered in BP Group [RP 59-11](#) and BP Group [RP 59-7](#). However, when specifying antennas the following main parameters should be included:-

- (a) Power gain and directivity gain - for all antennas this should be stated for performance confirmation purposes. Typically, half wave dipole antennas should be used.
- (b) Radiation pattern: horizontal and vertical polarisation patterns should be provided for performance confirmation purposes. Omnidirectional antennas should be used.
- (c) Frequency and bandwidth i.e. with respect to vswr. Vswr's should be specified to meet manufacturer's accepted values. Typically, 2.5:1 at hf and 1.5:1 at vhf.
- (d) Mechanical strength, i.e. operating and surviving wind speed. Typically survival speeds could be up to 50m/s (about 110 mph).
- (e) Type of materials: Marine grade stainless steel is preferred although galvanised steel is acceptable.
- (f) Surface treatment i.e. protection against corrosion between dissimilar metals and water ingress should be provided.



- (g) Required matching circuits; tuning units or baluns/transformers if required details should be stated.

Antenna feeders should comply with BS 2316. However, antenna feeder requirements should be selected according to following parameters:-

- (a) Type of feeder e.g. low loss, URM 67 in accordance with BS 2316.
- (b) Sheath: All feeders should have a flame retardant sheath to prevent fire propagation to other covered cables on the installation and be mechanically protected by braid. The outer sheath should be non-hygroscopic.
- (c) Impedance. Typically 50 ohms, 75 ohms and 300 ohms.
- (d) Frequency range with respect to vswr and attenuation. The impedance of any feeder, should be in accordance with BS 2316.
- (e) Attenuation including allowance for connectors and antenna.
- (f) Type of connectors e.g. N type, UHF, BNC etc.

See BP Group RP 59-11 and BP Group RP 59-7 for details of design and installation requirements for antenna feeders.

7.2 Antenna Siting

Antennas should be located so that they are clear of moving structures (e.g. cranes etc.) and helicopters landing and take-off areas. Adequate precautions should be taken in accordance with BS 6656, NRPB volume 4, No 5 and BP Group RP 59-7 to protect personnel and the installation from the effects of radio-frequency radiation, potential ignition and interference.

A number of antennas will be required and most of these will be omnidirectional. The location of the antennas should be as high as possible in non hazardous areas of the installation. Possible locations will be on the roof of the Living Quarter (LQ), beneath the helideck or on separate antenna tower. See BS 6656, NRPB volume 4, No 5 and BP Group RP 59-7 for further details on safety limits and for siting of antennas.

8. PLANNING AND PROCUREMENT

The following activities should be considered during the early planning and design:-

- (a) Statement of Requirements and Design

A statement of requirements should be drawn up which clearly states the shipping and aeronautical communication needs. An outline specification for the overall shipping and aeronautical communication requirements should be produced.



A definition of the shipping and aeronautical communication facilities required as outlined in section 3.1 of this Recommended Practice can be used to produce the SOR. This should be followed with an outline specification of the requirements based on details given in section 3.2, 4, 5, 6 and 7. See BP Group [RP 59-11](#) for details of design practices to be followed and BP Group [RP 59-7](#) for details of electromagnetic compatibility requirements to be taken into account during design.

(b) Mandatory or Regulatory Requirements

Radio operating and frequency licence applications and equipment approvals needs should be discussed with the regulatory authorities very early in the planning stage. Any constraints should be incorporated into the system planning.

Radio operating frequencies need to be obtained from the national civil aviation authority for the NDB and the vhf radiotelephone. The marine radio communication and radar systems operate on internationally agreed radio frequencies and individual frequency licences are not normally required. A ship's radio operating licence will be required and should be applied for listing all the marine and aeronautical equipment to be used on the installation. All equipment should be type approved by the national authority

(c) Antenna and Weather Sensor Location Considerations

As explained in sections 3.2 and 4.5 the positions of the various antennas and sensors on the installation should be investigated at an early stage to ensure that they will be clear of the various structures located offshore and they will not cause any hazard to personnel on the installation. All lf/mf/hf antenna tuning units should be housed in locked caged enclosures.

(d) Equipment Location and Accommodation

Adequate provision should be made during the early design of the installation for space for the various radio consoles and equipment cabinets. All locations should have suitable facilities for cabling, power supply distribution and earthing.

As explained in section 3.2 the radio room should be the main location for any shipping and aeronautical communications equipment, however, other locations will be required and provision should be made within the architectural design of the installation. See BP Group [RP 59-11](#) for details of design and installation requirements.

(e) Suppliers and Vendors

It will be necessary at an early stage to determine which vendors are capable and willing to carry out the detailed design, supply, installation, commissioning and possible maintenance for all the shipping and aeronautical communications systems.

It should be possible to have one vendor/contractor to complete the main scope of work for the complete shipping and aeronautical communication requirements and the on-platform communication systems including installation and commissioning,. Any necessary sub-



division of equipment supply amongst various manufacturers should be handled by the main shipping, aeronautical and on-platform communication systems contractor. Certain items of equipment, however, may be better supplied through other main contractors and is recommended that the equipment for the lifeboats be supplied as part by the vendor supplying the lifeboats. This will avoid any difficulties encountered with installation within the lifeboats that can occur when two independent contractors each have their own contractual responsibilities. For the same reason, it is recommended that the contract for the provision of shipping and aeronautical communications systems be combined with the provision for the on-platform communication systems, i.e. the interfaces between the two provisions are usually sufficiently large to justify a combined one-off contract, e.g. design and installation requirements within the consoles.

As a basic principle, the use of unproven suppliers should be avoided if at all possible. Suppliers should only be used where they have a proven track record for such projects and where they have internal organisation geared to rapid response situations.

(f) Specification of standard and well proven equipment

Equipment should be specified to have been proven in a similar application. Rugged construction, reliability, maintainability and climatic durability are factors which should receive particular attention. See BP Group [RP 59-11](#).

The following general planning concepts should be adopted:-

(a) A single point of contact should be appointed to be in direct control for managing the implementation.

There are likely to be many contractors, suppliers and vendors involved in the implementation of the telecommunication systems for an offshore manned fixed installation and the shipping and aeronautical systems are only one aspect. In order to co-ordinate the interfaces between the various systems a single point of contact is required. There is also a need to liaise with radio regulatory administrations. Only by the use of a company or company nominated technical telecommunications representative managing the implementation can success be assured. A full time supervisor of the activities involved is necessary to co-ordinate the various tasks and to have the necessary authority for the co ordination and negotiations that are needed.

(b) Testing and Documentation Requirements

Design and procurement documentation should be completed at an early stage. See BP Group [RP 59-11](#) for details of testing and documentation requirements.

(c) Implementation and Installation

Implementation should rely on close co-operation with the selected vendor for meeting the technical performance and timescales required. The selected contractor should provide all the necessary skills, commissioning spares, consumables and test equipment required to complete the implementation within the required timescales.



A team of personnel dedicated to the contract should be nominated by the contractor. The contractor should hold regular meetings with the purchaser and issue monthly reports on progress against an agreed programme.

A full set of spares needed for commissioning would normally be included within the supply contract, however, the contractor should confirm that spare parts can be obtained within twenty-four hours from the relevant manufacturer or that they are held by the contractor as stock. Any items not available within twenty-four hours should be purchased and held by the contractor.

See BP Group [RP 59-11](#) for details of installation practices to be used. See BP Group [RP 59-7](#) for guidelines on electromagnetic compatibility during installation.

9. OPERATION AND MAINTENANCE

During operation, the various telecommunication systems on the installation will need to be maintained and the various telecommunications contractors will need to be supervised and co-ordinated. This activity will need to be carried out by an appointed member of staff offshore on the installation.

It is likely that this function could be handled by a full time telecommunications technician on the installation together with overall supervision being handled by the main installation lead engineer.

Systems should be specified to include equipment for automatic diagnosis, supervision and display of minor and major faults that develop and only minimum routine maintenance should be required. However, a set of routine maintenance testing and alignment procedures may need to be developed for certain equipment according to manufacturers recommendations. These procedures should also identify resources, schedules and necessary test equipment requirements.

Manufacturers and vendors supplying the original systems should be requested to supply any necessary routine maintenance procedures as part of the main equipment supply, installation and commissioning contract. Generally, test procedures will be according to manufacturer's recommendations, however, reference should be made to CCIR and CCITT recommendations

A set of maintenance call-out and fault reporting procedures will need to be developed that identify central locations on the installation for assistance with communication failures and breakdowns.

The centre for fault reporting will tend to be either the radio room or the central control room on the installation. All faults or complaints regarding communication services on the installation should be handled by the offshore telecommunications technician. Maintenance call-out requirements should be included in any contract details that are drawn up for equipment maintenance.

Adequate test equipment should be provided to carry out the routine preventative maintenance procedures and for fault finding.

The vendor supplying the original telecommunication systems should be requested to provide any necessary special-to-type test equipment or special tools as part of the main equipment supply, installation and commissioning contract. Any special test equipment would normally be manufactured by the equipment supplier and would be specifically designed to carry out tests on a particular units/sub-system, e.g. extension boards, cards, connecting lead and adapters etc., that are



required to give access to components when a sub-unit is being tested as part of a working rack and to interface the test equipment to the units to be tested.

The maintenance philosophy should be to replace faulty equipment modules and sub-units offshore, and then return to the manufacturer for repair. A minimum quantity of one spare unit should be provided offshore for all items of hardware where standby units are not already available in the equipment supplied. The quantity and type of spare parts provided should be based on the expected reliability of each item and the required ordering periods.

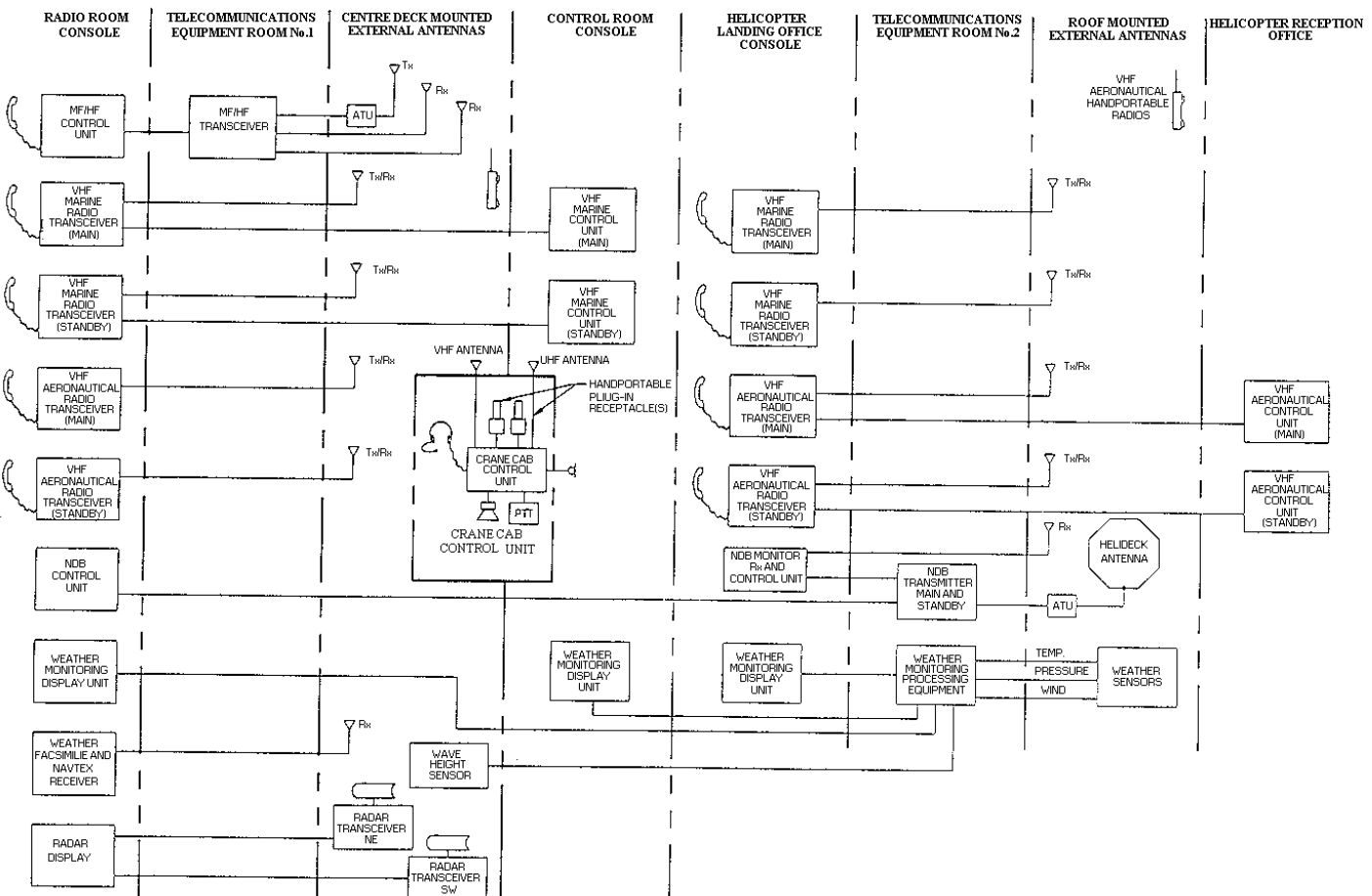
Sufficient skills and test equipment should be available to carry out first and second level maintenance, and the resources should be available offshore. The holding of component spares should be minimal and components should only be provided where fault diagnosis to component level is possible. Spare parts should be available from suppliers for a period of not less than ten years from the date of installation. MTBF's should be stated for all equipment and the availabilities should be calculated based on a minimum MTTR of four hours, assuming that spare parts will be available offshore. In addition, spare parts should be provided for items on long delivery that would not normally fail, but whose breakdown could cause a catastrophic system failure.





TYPICAL SHIPPING AND AERONAUTICAL COMMUNICATIONS SYSTEM BLOCK DIAGRAM

FIGURE 1



DEFINITIONS AND ABBREVIATIONS

Definitions

Standardised definitions may be found in the BP Group RPSEs Introductory Volume.

Abbreviations

A3E	Double Sideband
AH	Ampere Hour
AM	Amplitude Modulation
AMSL	Above Mean Sea Level
ARPA	Automatic Radar Plotting Aids
BNC	Coaxial cable connector (bayonet-Neill-Concelman)
CAA	Civil Aviation Authority
CCIR	International Committee for Radio Recommendations
CCITT	International Committee for Telephony and Telegraphy Recommendations
DC	Direct Current
DCS	Distributed Control System
DOT	Department of Transport
DTI	Department of Trade and Industry
EIA	Electronic Industries Association (USA)
EIRP	Effective Isotropically Radiated Power
EPIRB	Emergency Position Indicating Radio Beacon
ETSI	European Telecommunications Standards Institute
F3E	Telephony, by direct frequency modulation of the carrier
FM	Frequency Modulation
G/T	Gain to Temperature figure of merit for radio satellite receivers including antenna
H3E	SSB full carrier
HF	High Frequency (3 MHz to 30 MHz)
ICAO	International Civil Aviation Organisation
IEC	International Electrotechnical Commission
IMO	International Marine Organisation
Inmarsat	International Maritime Satellite Organisation
ITU	International Telecommunications Union
J3E	SSB suppressed carrier
kHz	1 kHz = 1000 Hz
LF	Low Frequency (30 kHz to 300 kHz)
MF	Medium Frequency (300 kHz to 3 MHz)
MTBF	Mean Time Between Failures
MHz	1 MHz = 1000 kHz
MTTR	Mean Time To Repair

N type	Coaxial cable connector (Neill, Paul)
NAVTEX	Navigational Text Radio Receiver
NDB	Non Directional Beacon
NON	No modulation
NRPB	National Radiological Protection Board
NTA	Norwegian Telecommunications Administration
PABX	Private Automatic Branch Exchange
PEP	Peak envelope power
PSTN	Public Switched Telephone Network
QFE	Barometric pressure at the height of the aerodrome
QNE	The height indicated on landing at an aerodrome when the altimeter subscale is set to 1013.25mb
QNH	The pressure at sea level
R3E	SSB reduced carrier
SARSAT	Search and Rescue Satellite Aided Tracking
SCADA	Supervisory Control and Data Acquisition System
SI	Statutory Instrument
SINAD	Signal to Noise and Distortion
SOLAS	Safety of Life at Sea (IMO)
SOR	Statement of Requirements
SSB	Single Sideband
UHF	Ultra High Frequency (300 MHz to 3000 MHz)
UKOOA	United Kingdom Offshore Operators Association
UPS	Uninterruptable Power Supply
URM	Uniradio metric size coaxial cable
VDU	Video Display Unit
VHF	Very High Frequency (30 MHz to 300 MHz)
WMO	World Meteorological Organisation



LIST OF REFERENCED DOCUMENTS

A reference invokes the latest published issue or amendment unless stated otherwise.

Referenced standards may be replaced by equivalent standards that are internationally or otherwise recognised provided that it can be shown to the satisfaction of the purchaser's professional engineer that they meet or exceed the requirements of the referenced standards.

The following are UK Regulations, Standards, Guides and Codes of Practice containing sections relevant to the design of Shipping and Aeronautical Communication Systems and should be referred to for the interpretation and application of this Recommended Practice:

British Standards

- BS 2316:** Specification for Radio Frequency Cables
- BS 5345:** Code of Practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture) Part 1 Basic requirements for all parts of the code Part 2 Classification of hazardous areas
- This is primarily concerned with the classification of hazardous areas and the selection of appropriately certified equipment for those areas;*
- BS 5501:** Electrical apparatus for potentially explosive atmospheres Part 1 General requirements Part 5 Flameproof enclosures Part 7 Intrinsic Safety 'I'
- This describes the requirements for equipment for use in hazardous areas;*
- BS 6656:** Guide to Prevention of inadvertent ignition of flammable atmospheres by radiofrequency radiation Revised 1991;

CAA

- OP 15** Minimum performance specification for vhf (am) transmitters and receivers
- OP 17** Minimum performance specification for non-directional beacons (NDB)



CCIR Recommendations and Reports

RPN (Volume V)	Propagation in non-ionised media
RPI (Volume VI)	Propagation in ionised media
RM (Volume VIII)	Mobile and related satellite services

CCITT 1988 "Blue Book" Recommendations

Fascile III.2	International analogue carrier systems. (Rec. G.211-G544)
Fascile IV.1	General maintenance principles: maintenance of international transmission systems and telephone circuits (Rec. M.10-M.782)
Fascile IV.4	Specifications for measuring equipment. (Rec. O series)
Fascile VII.3	Terminal equipment and protocols for telematic services. (Rec. T.0-T.63)

CCITT recommendations are no longer published as complete sets i.e fasciles, as shown above but as individual recommendations. A complete list of all up to date publications is available from Omnicom, Herts.

CEE

CEE 22	Three pole 250v socket
------------------------	------------------------

Department of Trade and Industry Radio Communications Agency Specifications

MPT 1223	2182 kHz Watch Receiver
MPT 1224	MF/HF SSB Radiotelephone
MPT 1225	Radiotelephone alarm generating device
MPT 1251	VHF(FM) marine ship radio
MPT 1252	VHF(FM) Radiotelephone equipment for use in ships
MPT 1255	VHF(FM) marine radiotelephone for use in lifeboats (TEMPSC)
MPT 1256	EPIRB
MPT 1260	Inmarsat
MPT 1326	VHF/UHF radio equipment for use in private mobile radio bands

Electrical Industries Association (USA)

[EIA RS](#)

European Telecommunications Standards Institute.

ETS 300 152:1991	EPIRBs (121.5 & 243 MHz)
prETS 300 162	VHF marine radios
prETS 300 225	Lifeboat vhf radios
prETS 300 242	Group 3 facsimile equipment
ETS 300 065	NAVTEX
ETS 300 066	EPIRBs 406.025 MHz
ETS 300 067	Radiotelex MF/HF
prETS 300 204	Inmarsat 'C'



International Civil Aviation Organisation

[Annex 10 to the Convention on International Civil Aviation. Volume 1, Aeronautical Communications.](#)

International Electrotechnical Commission

[IEC 96-2](#) Radio Frequency Cables

IEE Recommendations for the Electrical and Electronic Equipment of Mobile and Fixed Offshore Installations

A general design guide for electrical and electronic equipment on offshore applications.

International Telecommunications Union

[ITU Radio Regulations.](#) Volumes one, two and three

[Mineral Workings \(Offshore Installations\) Act 1971](#)

(i) *Offshore Installations (Construction and Survey) Regulations 1974, SI 1974/289*

Prescribes the use of standards for the design and construction of offshore installations and includes requirements relating to equipment to be placed in hazardous areas.

(ii) *Offshore Installations: Guidance on Design and Construction - Department of Energy*

Includes guidance on matters relating to certification, emergency shutdown systems and emergency power supplies.

National Radiological Protection Board

Volume 4, No 5 1993 *Board Statement on Restrictions on Human Exposure to Static and Time Varying Electromagnetic Fields and Radiation*

Statutory Instruments

[SI 1019](#) Offshore Installations Operational Safety, Health and Welfare Regulations

[SI 1203](#) The Merchant Shipping (Navigational Equipment) regulations
[SI 1513](#) Submarine Pipe-Lines Safety Regulations



World Meteorological Organisation

Manual on the global telecommunications system volume one. Part 3, section seven. [WMO publication 386](#)

BP Group Documents

RP 59-1	<i>Telecommunication - emergency Shutdown System.</i>
RP 59-2	<i>Selection of Network Communications for Manned Offshore Fixed Installations.</i>
RP 59-4	<i>Selection of On-platform Communication for Manned Offshore Fixed Installations.</i>
RP 59-5	<i>Selection of Emergency Communication for Manned Offshore Fixed installations.</i>
RP 59-6	<i>Selection of Telecommunication Power Supplies for Manned Offshore Fixed Installations.</i>
RP 59-7	<i>Electromagnetic Compatibility for Manned Offshore Fixed Installations.</i>
RP 59-8	<i>Selection and use of Temporary Telecommunication for Offshore installation Projects.</i>
RP 59-11	<i>Design and Installation Practice for Telecommunication Systems on Manned Offshore Fixed Installations.</i>

