

Telecommunication and IT systems for drilling units

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Foreword	5
Introduction	5
1 Scope	6
2 Normative and informative references	6
2.1 Normative references	6
2.2 Informative references	6
3 Terms, definitions and abbreviations	6
3.1 Terms and definitions	6
3.2 Abbreviations	7
4 Functional requirements	8
4.1 General	8
4.2 Responsibilities	8
5 Basic functions	9
5.1 Power requirement	9
5.2 Documentation	9
5.3 Process/ambient conditions	9
5.4 Operational requirements	9
5.5 Maintenance requirements	9
5.6 Isolation and sectioning	9
6 Telecommunication equipment room	9
7 Information technology (IT) security	10
7.1 General	10
7.2 Requirements	10
7.3 Recommendations	10
8 Local area network (LAN)	10
8.1 General	10
8.2 Requirements	10
8.3 Options	11
9 Communication links	11
9.1 General	11
9.2 Requirements	11
9.3 Recommendations	11
10 Wide area network (WAN)	12
10.1 General	12
10.2 Requirements	12
10.3 WAN accelerators	12
10.4 Extranet services	12
10.5 Guidelines for band width allocation for voice	12
10.6 Guidelines for band width allocation for video	12
10.7 Guidelines for band width allocation - realtime data	<u>13</u>
11 Private automatic branch exchange (PABX)	<u>13</u>
11.1 General	<u>13</u>
11.2 Requirements	<u>13</u>
11.3 Recommendations	<u>13</u>
12 Audio and video entertainment	<u>13</u>
12.1 General	<u>13</u>
12.2 Requirements	<u>13</u>
13 Ultra high frequencies (UHF) radio	<u>13</u>
13.1 General	<u>13</u>
13.2 Requirements	<u>14</u>
13.3 Recommendations	<u>14</u>
14 Facilities for integrated operations	<u>15</u>
14.1 General	<u>15</u>

14.2	Integrated operations	15
14.3	Technical specifications	15

Annex A (informative) Recommended responsibility sharing between drilling contractor and operator 20

Annex B (informative) IP Subnet address allocations 24

Annex C (informative) Responsibility matrix 25

Foreword

The NORSOK standards are developed by the Norwegian petroleum industry to ensure adequate safety, value adding and cost effectiveness for petroleum industry developments and operations. Furthermore, NORSOK standards are, as far as possible, intended to replace oil company specifications and serve as references in the authorities' regulations.

The NORSOK standards are normally based on recognised international standards, adding the provisions deemed necessary to fill the broad needs of the Norwegian petroleum industry. Where relevant, NORSOK standards will be used to provide the Norwegian industry input to the international standardisation process. Subject to development and publication of international standards, the relevant NORSOK standard will be withdrawn.

The NORSOK standards are developed according to the consensus principle generally applicable for most standards work and according to established procedures defined in NORSOK A-001.

The NORSOK standards are prepared and published with support by The Norwegian Oil Industry Association (OLF), The Federation of Norwegian Industry, Norwegian Shipowners' Association and The Petroleum Safety Authority Norway.

NORSOK standards are administered and published by Standards Norway.

Introduction

This edition replaces edition 2. This NORSOK standard is updated in accordance with NORSOK T-100. The standard is expanded and also covers IT systems.

The following subjects are new or updated:

- facilities for integrated operations, see clause 14 and annex C;
- information technology (IT) security, see clause 7;
- wireless LAN requirements, see 8.2;
- QoS and priority policy, see 10.2;
- WAN accelerators and optimizing, see 10.3;
- guidelines band width allocation for voice, see 10.5;
- guidelines band width allocation for video, see 10.6.

1 Scope

The purpose of this NORSOK standard is to outline the necessary data- and telecommunication services needed onboard a drilling unit in order to fulfil the operator's requirements for voice, data and video communication between the drilling unit and the operator's communication networks, regardless of distance to shore. It also forms the basis for achieving cost reduction by combining drilling contractor's and operator's needs for similar services.

This NORSOK standard does not address any aspects regarding the drilling unit's own operational needs or any requirement with which the drilling unit shall comply in order to meet mandatory requirements. The complementary onshore facilities are not dealt with in this NORSOK standard.

2 Normative and informative references

The following standards include provisions and guidelines which, through reference in this text, constitute provisions and guidelines of this NORSOK standard. Latest issue of the references shall be used unless otherwise agreed. Other recognized standards may be used provided it can be shown that they meet the requirements of the referenced standards.

2.1 Normative references

IEEE 802.3,	Standards defining the Physical Layer and Data Link Layer's
IEEE 802.11,	Standards carrying out wireless local area network in 2.4, 3.6 and 5 GHz frequency bands
NORSOK T-100,	Telecom subsystems

2.2 Informative references

NORSOK S-002,	Working environment
H.323,	Communication protocol for internet telephony (both voice and video)

3 Terms, definitions and abbreviations

For the purposes of this NORSOK standard, the following terms, definitions and abbreviations apply.

3.1 Terms and definitions

3.1.1

can

verbal form used for statements of possibility and capability, whether material, physical or casual

3.1.2

C-band

satellite frequency band 6 GHz uplink/the band 4 GHz downlink

3.1.3

central equipment

equipment which is the operational hub of individual subsystems

3.1.4

collaboration room

meeting room with display and videoconference functionality

3.1.5

contractor

service company (3rd party) - operator providing various services (i.e. measurement while drilling, cementing, telecommunication provider) to the operator and drilling contractor

3.1.6

drilling contractor

rig owner or rig manager - operator providing the drilling unit and associated services to the operator

3.1.7**drilling unit**

vessel furnished with drilling equipment which main objective is to drill exploration/production wells

3.1.8**equipment**

individual functional unit

3.1.9**integrated operation**

the use of information communication technology to create effective work processes, to facilitate better and faster decisions for management of oil and gas assets

3.1.10**Ku-band**

satellite frequency band 14 GHz uplink/the band 12 GHz downlink

3.1.11**may**

verbal form used to indicate a course of action permissible within the limits of this NORSOK standard

3.1.12**operator**

operating oil company

3.1.13**operation room**

permanently manned collaboration facility to support current operation

3.1.14**shall**

verbal form used to indicate requirements strictly to be followed in order to conform to this NORSOK standard and from which no deviation is permitted, unless accepted by all involved parties

3.1.15**should**

verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required

3.1.16**subsystem**

assembly of equipment within complete systems, which fulfils a certain operational task

3.1.17**technical room**

equipment room

3.2 Abbreviations

AV	audio and video equipment
CCTV	closed circuit television
EX	electrical equipment in hazardous areas
GSM	global system for mobile communication
HSE	health and safety executive
HVAC	heating, ventilation and air conditioning
IEEE	Institute for Electrical and Electronic Engineers
IO	integrated operation
IP	internet protocol
IT	information technology
KVM	keyboard, video and mouse

LAN	local area network
LCD	liquid crystal display
N/A	not applicable
PABX	private automatic branch exchange
PC	personal computer
PL	phase lock (to non-audible code)
QoS	quality of service
SOIL	Secure Oil Information Link (oil and gas secure collaboration network in Norway).
UHF	ultra high frequencies
UPS	uninterruptible power supply
VLAN	virtual local area network
VRF	virtual routing and forwarding
VSAT	very small aperture terminal
WAN	wide area network
WiTi	a class of wireless local area network (WLAN) devices based on the IEEE 802.11 standards

4 Functional requirements

4.1 General

The drilling unit shall be equipped with suitable facilities (as shown in Figure 1) for data- and telecommunication services between the drilling unit and operator's communication networks. See also information details shown in Figure 1.

4.2 Responsibilities

The drilling contractor will be the main responsible for the data -, telecommunication and network infrastructure according to an agreement with operator.

Overall system

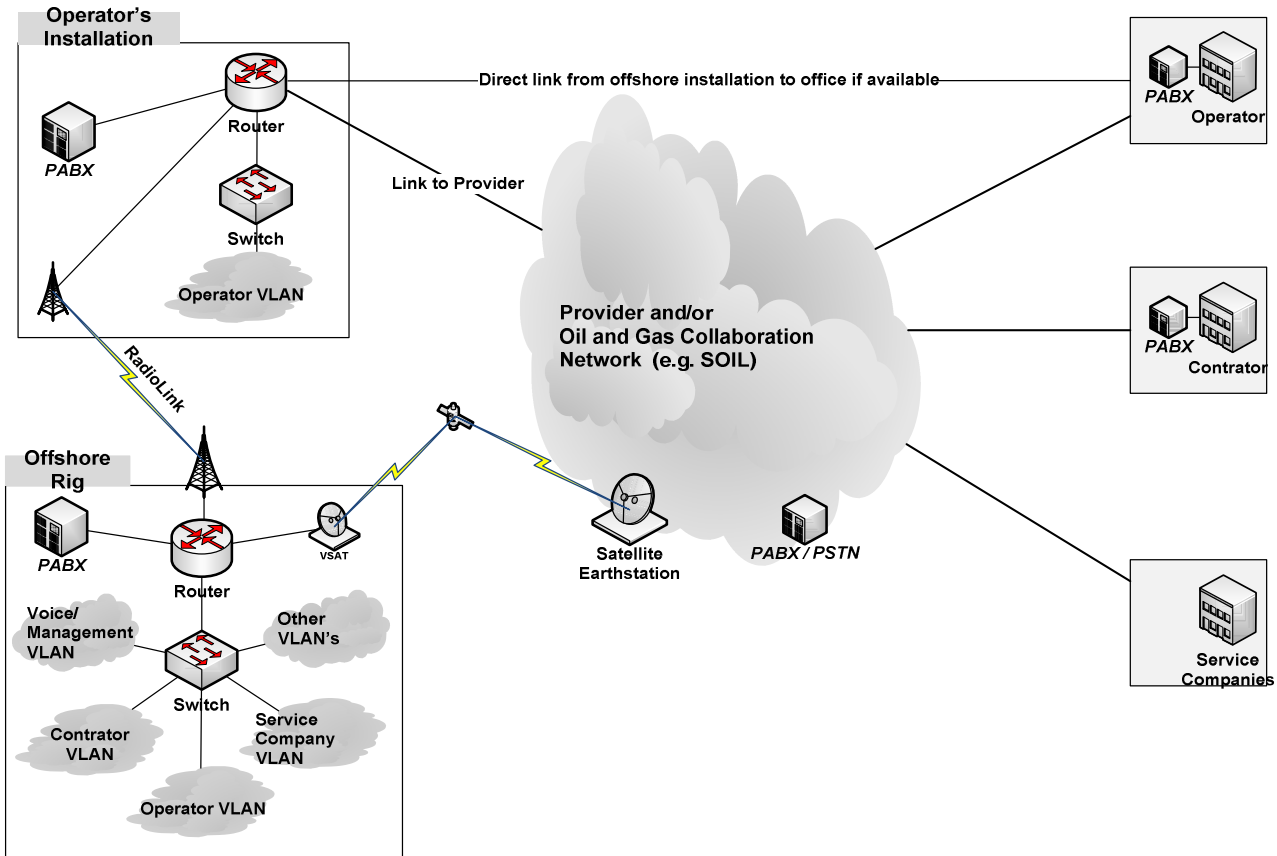


Figure 1 – Principle drawing

5 Basic functions

5.1 Power requirement

Telecommunication and data systems and equipment shall be powered from an UPS source or sources. Telecommunication and data systems and equipment shall be individually controlled by the drilling unit's shutdown system. Capacity of the UPS shall be at least 2 h calculated according to NORSOK T-100.

5.2 Documentation

The following requirements apply to documentation:

- a) the drilling contractor is responsible for providing, updating and maintaining all relevant documents and certificates related to IT, telecommunication and network infrastructure;
- b) the documentation shall be available in electronic format, e.g. portable data format;
- c) the following documentation shall be available onboard:
 - 1) data and telephone distribution network single line diagram;
 - 2) list of IP subnet and virtual LAN allocation per party;
 - 3) ethernet switch port allocation – only patching information, not VLAN documentation;
 - 4) router access list - confidential information. Access lists available in router config, included a backup version;
 - 5) radio frequencies;
 - 6) UHF radio repeater stations antenna cabling diagram;
 - 7) UHF coverage diagrams;
 - 8) CCTV coverage and external interfacing;
 - 9) drilling system monitor;
 - 10) wireless local area network (WLAN) coverage diagram.

5.3 Process/ambient conditions

Environmental conditions shall be in compliance with the equipment manufacturer's specifications.

5.4 Operational requirements

Easy access shall be arranged to reroute/reconfigure data or telephone channels without interrupting other traffic within the network.

5.5 Maintenance requirements

Maintenance shall be carried out in accordance with recommendations provided by the equipment supplier(s).

5.6 Isolation and sectioning

Easy access shall be arranged to isolate a data or telephone connection in order to fault trace the system.

6 Telecommunication equipment room

The following items should be located onboard in a central telecommunication equipment room:

- a) PABX;
- b) satellite terminal (modem, antenna control unit, etc.) ;
- c) available space for one 482,6 mm (19 in) wide standard rack with ventilation for heat dissipation (minimum height: 42 units) for drilling contractor's/operator's multiplexer(s), router(s), hub(s), switch(es), modem(s) etc.;
- d) available space for one spare 482,6 mm (19 in) wide standard rack (minimum height: 42 units) for contractor's/operator's file and/or database server(s). Alternatively, in lack of space, the rack for the server(s) may be located in or near the radio room;
- e) main distribution panel for office data and telephone network, which shall be located in same or adjacent rack(s);
- f) available space for radio link equipment in case a radio link will be required, including
 - 1) outside equipment facilities,
 - 2) space for radio directional link antenna for any direction,
 - 3) installed low loss coaxial cable for these antenna position.
- g) IO equipment may be located to a dedicated IO equipment room.