# NORSOK STANDARD

# T-001

**Rev. 3, December 2003**

# Telecom systems

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## 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 Subject to development and publication of international standards, the relevant NORSOK standard will be withdrawn.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 standards work and according to established procedures defined in NORSOK A-001.

The NORSOK standards are prepared and published with supported by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Manufacturing Industries). NORSOK standards are administered and published by Standards Norway.

Annex A is informative. Annex B forms a normative part of this NORSOK standard.

## Introduction

Revision 3 of this NORSOK standard replaces revision 2 of December 2000. The telecommunication subsystems given subsystem number, but no revision status, are usually specified by company.



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# 1 Scope

This NORSOK standard describes the basis for design and engineering of telecommunication systems, given revision status in the table below, on-board a manned offshore installation.

| Subsystem | Title | Revision status |
|---|---|---|
| 86-00 | General | Rev 03 of June 2003 |
| 86-11 | PA | Rev 03 of June 2003 |
| 86-12 | Driller's intercom | Rev 03 of June 2003 |
| 86-21 | PABX | |
| 86-22 | Multiplexer | |
| 86-24 | Office data and telephone cabling network | Rev 03 of June 2003 |
| 86-25 | Platform intercom | |
| 86-31 | Radio links | |
| 86-35 | Satellite links | |
| 86-37 | Private radio networks | |
| 86-38 | Cable links | |
| 86-39 | Fibre optic links | |
| 86-41 | General radio | Rev 03 of June 2003 |
| 86-42 | UHF radio and paging | Rev 03 of June 2003 |
| 86-43 | Audio and video entertainment | Rev 03 of June 2003 |
| 86-51 | CCTV | Rev 03 of June 2003 |
| 86-52 | Meteorological observation | Rev 03 of June 2003 |
| 86-53 | Marine radar | Rev 03 of June 2003 |
| 86-54 | Aviation radar | |
| 86-55 | Communication recorder | |
| 86-56 | Loudspeaker surveillance | Rev 03 of June 2003 |
| 86-61 | Shuttle tanker loading telemetry | |
| 86-62 | Work over telemetry | |
| 86-63 | Pipeline telemetry | |
| 86-70 | Navigational aids | |
| 86-71 | DME | |
| 86-72 | ATIS/AFTN for aviation | |
| 86-73 | Positioning | |
| 86-81 | Main distribution frame | Rev 03 of June 2003 |
| 86-82 | Telecom power supply | Rev 03 of June 2003 |
| 86-83 | Real time clock | Rev 03 of June 2003 |
| 86-84 | Telecommunication monitoring system | Rev 03 of June 2003 |

# 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 or exceed the requirements and guidelines of the standards referenced below.

BS 6656, *Guide to prevention of inadvertent ignition of flammable atmospheres by radio-frequency radiation*

ITU-T rec.G.821, *Error performance of an international digital connection operating at a bit rate below the primary rate and forming part of an integrated services digital network (ISDN).*

NORSOK T-100, *Telecom subsystems.*



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

**3.1.2**
**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

**3.1.3**
**may**
verbal form used to indicate a course of action permissible within the limits of the standard

**3.1.4**
**can**
verbal form used for statements of possibility and capability, whether material, physical or casual.

**3.1.5**
**company**
contractual responsible company

## 3.2 Abbreviations

| | |
|---|---|
| AFTN | aeronautical fixed telecommunications network |
| ATIS | automatic terminal information service |
| APS | abandon platform shut down |
| BS | British Standard |
| CCR | central control room |
| CCTV | closed circuit television |
| DC | direct current |
| DME | distance measuring equipment |
| DNMI | Det Norske Meteorologiske Institutt (Norwegian Meteorological Institute) |
| DTMF | dual tone multi frequency |
| ECC | emergency control centre |
| GMDSS | global maritime distress and safety system |
| IP | Internet Protocol |
| ITU–T | International Telegraph and Telephone Consultative Committee |
| PA | public address and alarm |
| PABX | private automatic branch exchange |
| SPL | sound pressure level |
| UHF | ultra high frequency |
| VAC | volt alternating current |
| VDC | volt direct current |
| VHF | very high frequency |

# 4 Technical requirements

## 4.1 General

The telecommunication systems shall provide facilities to support safety and efficient operation. This includes internal communication, telemetry systems, telecommunication networks and external communication to the operational centre onshore, to other installations and systems for marine and air activities.



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In an emergency situation it is essential that those telecommunication systems required remain active, provided that their continued operation does not create additional hazards.

## 4.2 Operational requirements

As a minimum, there shall be facilities which enable:

- Persons in control during the emergency situation to alert all personnel and give instructions.
- Persons in charge of safety related actions, work teams, and persons trapped by the incident to communicate with each other and with the ECC.
- The ECC to communicate with onshore emergency control centre, nearby offshore installations, helicopters, ships and locations on the platform.

## 4.3 Safety systems

In an emergency situation, the following telecommunication systems shall be available and in operation:

- PA.
- UHF radio.
- PABX (switched telephone system).
- Mandatory and general radio.
- Communication to shore and other installations.

These systems shall be designed and installed with high degree of protection against influence from external events (e.g. fires, gas and fluid leaks, explosions etc.) to ensure continuous operations. To achieve this, the following requirements shall apply:

- The equipment room with the central equipment and batteries shall be located in the safest area on the installation.
- The room shall be provided with isolation facilities. If gas is detected in the air intake to the room, the room shall be isolated to prevent gas from entering the room.
- The systems shall operate independently in critical situations.
- There shall not be any piping for liquids going through the equipment room.
- Risk for fire in the room shall be minimised.

## 4.4 Uninterruptable power supply requirements

Important telecom equipment shall be DC powered from the telecom battery supply.
Telecommunication systems not made for DC-powering shall be powered from the platform uninterruptible power supply power system.

## 4.5 Muster stations

At least two different communication facilities shall be available at the muster stations. The main facilities being handportable radios and telephones.

Required telecommunication units at the muster station where the APS switch is located:

- Telephone (Ex).
- PA access unit (Ex).

## 4.6 Network

### 4.6.1 General

All network connected systems shall comply with the network structure, principles and services for the relevant installation.

### 4.6.2 Network availability

The external connections shall be designed according to:



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- The evaluation of availability based on duration and frequency of interruptions as well as the number of channels and services being affected. The method specified in ITU-T rec. G.821 shall be applied. The total cost of high availability shall be balanced with the consequences of service interruptions.
- No single equipment failure shall cause a total interruption in the communication links for important operational and control functions.

#### 4.6.3 Network synchronization

The established company network synchronization plan shall be followed.

### 4.7 Telemetry and remote control systems

Relaying of important remote control signals shall utilise fail safe signal transmission systems to ensure safe operations in case of malfunctions, i.e. shut down in conjunction with pipelines, offshore loading, well maintenance rigs.

### 4.8 Shut down of telecommunication systems

#### 4.8.1 General

Some telecommunication systems shall be kept operational in critical situations.

#### 4.8.2 Field equipment

Non-Ex-certified field equipment shall be shut down by the area shut down commands. In all areas, sufficient Ex-certified communication equipment shall be in operation for emergency purposes.

#### 4.8.3 Central equipment

The central equipment that shall be kept operational in an emergency situation shall only be shut down after operation of an APS switch or by hazardous conditions in the central equipment room. The APS shut down action shall be delayed by 30 min.

It shall be possible to manually reset the timer circuit.

#### 4.8.4 Antennas

Limitation or shut down of the maximum allowed radiated power in flammable atmospheres of radio signals to the antennas shall be according to requirements in BS 6656.

With respect to disconnection of the antennas, all passive antennas shall be considered as a cable and shall as such not be disconnected if gas is detected in the area.

### 4.9 Antenna locations

Antennas shall be located to obtain:

- Optimum radio frequency reception/transmission.
- Minimum exposure to damage from heat generated by mud burners, exhaust or flare booms.
- Protection from damage by operational activities, i.e. cranes.
- Minimum radio interference between different antennas.
- Personnel safety.

The antennas shall be mounted in safe area. An antenna tower shall be used as the primary location for antennas.

There shall be a protected cable route between the antenna tower and the telecommunication equipment room. The route should be optimised to have no sharp bends and be as short and direct as possible.

Satellite antennas, if used, shall be located with an unobstructed view towards the actual satellite positions.

Redundant antennas for important safety systems shall be separated from the main antennas to avoid simultaneous obstruction or mechanical damage resulting in a total loss of communication.



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