



Exploration & Production

GENERAL SPECIFICATION

TELECOMMUNICATIONS

GS EP TEL 120

Point to point microwave links

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04	10/2008	Standards update and correction
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Rev.	Date	Notes



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1. Scope

The point to point microwave digital links set up by COMPANY shall be used as a transmission facility for its own telecommunications network and as interconnection means to domestic and international circuits.

This General Specification applies to point to point microwave digital radio links.

It includes the specifications for all of the following:

- Transmission over digital channels with a rate from 2 x 2 Mb/s to STM1(x)
- Auxiliary systems associated with the operation of the concerned links.

In addition, this Specification provides additional details to and completes General Specification **GS EP TEL 700** regarding the definition of the work and services to be provided by engineering.

This General specification does not include Free Space Optics connectivity, Broadband Optical Wireless equipment.

The contracting parties mentioned in this General Specification are listed hereafter:

- COMPANY The party which signs the contracts and purchase orders
- Engineer The party which works for the COMPANY under an Engineering, Procurement and Construction contract
- CONTRACTOR The fabrication CONTRACTOR on the yard or the construction CONTRACTOR on the final site
- Vendor (or Manufacturer) the SUPPLIER of the equipment.

The verbal forms used to indicate levels of requirement are specified in [ISO/IEC Directives, Part 2](#) and in the [Characteristics of good requirements](#) INCOSE Symposium 1996.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
1999/5/EC (art. 3.2) (R&TTE directive)	Directive on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity
IEC 60050-702	Oscillations, Signals and Related Devices
IEC 60487	Methods of measurement for equipment used in terrestrial radio-relay systems
IEC 60835-3-5	Methods of measurement for equipment used in digital microwave radio transmission
IEC 60950	Safety of Information Technology Equipment Including Electrical Business Equipment
IEC 62305	Protection against lightning

Reference	Title
IEEE 802.3	LAN/MAN CSMA/CD Access Method
ETSI TR 101 506	Fixed Radio Systems; Generic definitions, terminology and applicability of essential requirements under the article 3.2 of 99/05/EC Directive to Fixed Radio Systems
ETSI EN 301 126-1	Fixed Radio Systems; Conformance testing; Part 1: Point-to-Point equipment -Definitions, general requirements and test procedures
ETSI EN 301 751	(07/02) Fixed Radio Systems; Point-to-Point equipments and antennas; Generic harmonised standard for Point-to-Point digital fixed radio systems and antennas covering the essential requirements under article 3.2 of the 1999/5/EC Directive
ETSI EN 300 385	Electromagnetic compatibility and radio spectrum matters (ERM); Electromagnetic compatibility (EMC) standard for fixed radio links and ancillary equipment
ISO/IEC Directives, Part 2	Rules for the structure and drafting of International Standards
ITU-R F.752-2	Diversity techniques for point-to-point fixed wireless systems
ITU-T G.826	Error performance parameters and objectives for international constant bit rate digital paths at or above the primary rate
ITU-R BT.656	Interface for digital component video signals in 525-line and 625-line television systems
ITU-R M.1225	Guidelines for evaluation of radio transmission
ITU-R P.530-12	Propagation data and prediction methods required for the design of terrestrial line-of-sight systems. Link budget calculation method.
ITU-R P.1410	Propagation data and prediction methods
ITU-T X.209	Encoding rules specification of Basic Encoding Rules
ITU-T X.690	Encoding rules specification of Basic Encoding Rules
NF C15-100	(1991) Low-voltage electrical installations

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
ITU RR	ITU Radio Regulations



Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Characteristics of good requirements	Requirements Working Group of the International Council on Systems Engineering (INCOSE symposium 1996)

Total General Specifications

Reference	Title
GS EP TEL 410	Installation rules
GS EP TEL 700	Telecommunications Engineering services
GS EP TEL 710	Telecom equipment numbering

3. Local constraints

3.1 Geographical constraints

ENGINEER has to take into account the geographical constraints around the sites: sea, mountains, deserts and obstacles (forests, buildings, etc.).

3.2 Climatic constraints

ENGINEER has to take into account the climatic constraints: Marine environment (salt spray), extreme wind conditions, lightning, temperature, humidity, frost, dust, solar radiation,

3.3 Local Telecoms regulation

ENGINEER shall define parameters to be used on the basis of the specified documents approved by the national Regulatory Authority of the country.

ENGINEER shall indicate the need to obtain licences for the frequency plan specified.

4. Scope of work

This specification applies to define, to provide, to install, to validate a Line Of Sight system between two sites.

This specification does not include the modifications of the site itself (technical room, security, etc.).

ENGINEER shall take into account the environmental aspects like hazardous areas.

All the equipment shall be in compliance with [1999/5/EC \(art. 3.2\) \(R&TTE directive\)](#) of R&TTE directive and [ETSI TR 101 506](#).

5. Technical specifications

This chapter indicates the characteristics which the equipment has to respect. Part of these characteristics shall be defined by ENGINEER after study.

5.1 Frequency band

ENGINEER shall define the frequency band to be used on the basis of the frequency plan issued by the [ETSI EN 301 751](#), [ETSI EN 300 385](#) and [ITU RR](#) for point to point radio service in the country.

5.2 Frequency plan

ENGINEER shall define the frequency plan to be used on the basis of the following criteria:

- Existing point to point radio system of Total
- Conditions of propagation along the link path
- Type of modulation
- Carrier spacing
- Possible interference with other systems
- Diversity method and polarisation of the radio signal.

5.2.1 Link Budget

Each link budget hop will be calculated with the method included into the recommendation [ITU-R P.530-12](#), including the rain factor. The reference BER rate will be 10E-6.

Each profile hop will be described with PATHLOSS tool.

5.2.2 Diversity method

If needed ENGINEER should propose a diversity method to reduce the fading effect, with reference to the [ITU-R F.752-2](#).

For above the sea paths, space diversity and a horizontal (less sensitive to the height of the antenna than vertical) should be recommended.

5.2.3 Equipment protection

ENGINEER may propose a configuration with mono channel (1+0, 1+1 or 1+1 hot standby) or dual channels (2+0).

5.2.4 Auxiliary channels

Equipment shall have to comprise some service and auxiliary channels. It shall be possible to transmit alarms on those auxiliary channels.

5.2.5 Alarm indication

ENGINEER shall define what alarms is needed on the link:

- Tx, Rx loss
- Temperature Rx/Tx