



Exploration & Production

GENERAL SPECIFICATION

Telecommunications

GS EP TEL 133

Design of a TETRA network

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Contents

1. Scope	3
2. Reference documents.....	3
3. General.....	4
3.1 Specification	4
3.2 Usable frequency bands	5
3.3 System functionalities	5
3.4 Interfaces	9
4. TETRA system design	9
4.1 Requirements specification.....	9
4.2 Basic design	9
4.3 General system design	9
4.4 System architecture	10
4.5 Considerations concerning construction	10
4.6 Timescale for completion	11
4.7 Checking of frequencies	11
4.8 Range calculations and prediction of coverage	11
5. Equipment specifications.....	12
5.1 Core network specifications.....	12
5.2 Base Stations specifications	12
5.3 Base Station antennae specifications	13
5.4 Mobile and Fixed radios antenna specifications	13
5.5 Radio cables specifications	14
5.6 Radios Units specifications.....	14
6. Installation Rules.....	15
7. Security.....	15
8. Quality Assurance.....	15
9. Documentation	16
Appendix 1 Glossary.....	17

1. Scope

This general specification identifies the general rules to be complied with for the installation of Operation TETRA radio system including radio network and radio terminals.

The verbal forms used to indicate levels of requirement are specified in [ISO/IEC Directives, Part 2 \(edition 5: 2004\)](#) and [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
ETSI EN 300392	TETRA – Voice and Data (V+D)
ETSI EN 300394	TETRA – Inter Operability (IOP)
ETSI EN 300396	TETRA – Direct Mode Air Interface (DMO AI)
ETSI EN 300827	TETRA - CEM
ETSI EN 301489-18	CEM – Part 18 : Specific TETRA part.
IEC 60500	International Electrotechnical Vocabulary
ISO/IEC Directives, Part 2	Rules for the structure and drafting of International Standards

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
ATEX Directive 94/9/EC	Directive of the European parliament and the council on the approximation of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres
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 SAF 216	Area classification
GS EP TEL 410	Installation rules
GS EP TEL 700	Telecommunications Engineering services
GS EP TEL 710	Telecom equipment numbering

3. General

Complete TETRA system is divided into two sub-systems:

- Network part
 - Bases Stations (also called BS in [ETSI EN 300392](#) and [ETSI EN 300394](#))
 - Core(s) network
 - Links
 - Operating and Maintenance System
 - API (Application Programming Interface)
- Radios part (also called MS in [ETSI EN 300392](#) and [ETSI EN 300394](#))
 - Handheld portable
 - Fixed
 - Mobiles
 - Accessories

3.1 Specification

The complete system, network part and radios part, shall comply with the ETSI TETRA open system standard: [ETSI EN 300392](#), [ETSI EN 300394](#), [ETSI EN 300396](#).



In addition, the complete system shall meet the protection requirement as per [GS EP SAF 216](#).
All equipment shall be tagged according to [GS EP TEL 710](#).

3.2 Usable frequency bands

TETRA systems are only available in UHF band, 400MHz and 800MHz.

Usable frequencies shall be defined by COMPANY.

3.3 System functionalities

The Operation TETRA system shall comprise, but not be limited to, the following functionalities and features.

3.3.1 Mono-site and multi-site trunking mode

Mono-site and/or multi-site trunking mode shall be the normal functioning mode. It shall use 1 or up to 8 radio channels per site (1 control time slot and 3 to up 31 traffic time slots)

This mode shall allow individual -duplex and semi-duplex-, group and data calls, as defined in the ETSI TETRA standard, [ETSI EN 300392](#).

Multi-site trunking shall be supported by the system including hand-over – without call interruption -, reselection, and dynamic group area mechanisms.

3.3.2 Individual calls facilities

Depending upon the system rights policy, all handheld, mobiles or fixed radios may call one other radio registered anywhere in the TETRA network.

They may also call fixed phones using an ISDN or QSIG gateway.

Duplex and semi-duplex calls shall be supported, direct or hooked calls also.

Hand-over without call interruption or speech loss shall be supported by the radios and the system.

The Calling ID shall optionally be displayed on the radios' screens during ongoing call. Aliasing shall be done at least by the radio itself using the phonebook.

3.3.3 Group calls facilities

It shall be possible to define permanent (background) or selectable talk groups on handheld, mobile and fixed radios.

Talk groups shall if needed, be configured as hidden or listen only groups.

Talk groups shall be associated to a priority level.

These talk groups shall be easily selectable by a rotary button on the handheld radios, and/or by a scrolling button on the mobile or fixed radios.

The group aliases are configured into both the TETRA systems and the terminals and displayed on their screens.

The Calling ID is always displayed on the screens of radios which are listening the group communication during ongoing call.

In trunking mode, the users shall select a group, and shall transmit or receive communications to/from this group only, and additionally the communications of background groups and individual calls.

It shall be possible also to scan different groups using or not predefined scanning lists.

Any user shall be able to participate in an ongoing group communication after switching to this group (Late Entry).

Priority Scan shall be enabled if needed to specific groups.

These two facilities shall be enabled group by group.

The TETRA DGNA facilities shall be supported. Dynamic groups could be added to terminals over the air and the terminal membership shall also be managed remotely.

Some groups could be defined as pre-emptive groups, i.e., in case of lack of resource the system shall interrupt one of the ongoing, lower priority calls.

3.3.4 Data calls facilities

Short messages and status, as well as long data, circuit or IP, calls shall be supported by the radios and the system.

3.3.5 Emergency, pre-emptive and priority calls

All radios shall have the ability to make emergency calls.

The emergency call shall be routed to a specific group or individual destination.

In case of lack of resource, the emergency calls shall interrupt any existing non emergency call on the system at the time. If GPS localization solution implemented, the radio GPS localization shall be automatically sent to the system during the emergency call.

All radios, depending on the system configuration shall pre-empt the others terminals during ongoing individual semi duplex or group call.

All radios shall have the ability to make priority calls. The priority calls shall have the priority in the queue when no radio resources are available. The priority management shall compromise to the TETRA standard.

3.3.6 Calls recording

Recording calls shall be possible using an existing recorder or a dedicated recorder.

The call type to be recorded shall be simply configured.

Calls timestamp and caller/calling parts indication shall be stored.

Using a dedicated recorder, recorded calls shall be played back using a Windows PC based application. This application shall allow to get easily the right calls.

3.3.7 Fall-back mode

In case of a failure of the Operation TETRA Radio system, the system shall have the following fall-back modes: