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1 Subject of specification

This specification used in conjunction with other technical specifications of LOTOS Group S.A., establishes minimal requirements regarding designing and implementation technology of Dispatcher's Wired Telephony System.

2 Scope of validity

This specification shall be used when preparing both quotations and Purchase Orders concerning planned LOTOS Group S.A. new investments and modernizations.

It shall also be a base for preparation of other detailed specifications and quotations relevant for package units or other equipment deliveries.

2.1 Deviations

Any deviation from this specification and the relevant specifications, standards and related documents including proposals, which the bidder claims to be economically and / or technically superior solutions, must be submitted in writing for review and approval by Grupa LOTOS SA. Non-approved exceptions are not acceptable by Grupa Lotos S.A.

The supplier must report in writing any ambiguity in this or any other specifications of Grupa LOTOS SA or non-compliance with the referred documents / standards and obtain a written explanation from Grupa Lotos SA.

2.2 Exclusions

This specification does not cover:

- Requirements regarding cable systems
- Requirements regarding installation accessories
- Requirements regarding routing and laying of cables.

3 Hierarchy of documents

In case of conflicts existing between this specification and other documents, the following order of precedence shall govern:

- The current Polish legislation
- Terms of purchase order / contract and other requirements agreed in writing with GLSA
- Data Sheets approved by GLSA
- This specification
- Other Specifications
- Drawings and other documents
- Standards

4 Definitions and designations

4.1 Definitions

GLSA – Grupa Lotos S. A.

Dispatcher's telephone exchange – dispatcher and conference device, destined for setting up single or group connections between end instruments within network

Dispatcher's telephone – telephone set connected to dispatcher's network

End instrument – a device for converting of messages on electrical signal, or inversely

Phone outlet – terminal element of installation for connection of end instrument

Installation accessories – enclosures of distribution frames, racks, trays, tubes, boxes, etc.

Distribution frame – telecommunication passive device enabling connecting of circuits in installation cables with circuits in line cables (external), or with circuits of station equipment

Dispatcher's console – a device serving for setting up of telephone connections by dispatchers, in relation: the dispatcher – end terminal and/or dispatcher – factory network via PABX

Hotline– direct telephone connection between two devices within dispatcher's network

Teleconference – set up telephone duplex connections between at least three arbitrary terminals (telephone sets)

4.2 Designations

PABX – privet automatic branch exchange

PMX – privet manual exchange

JK – degree of protection provided by enclosure of equipment

4.3 Ambient conditions

▪ Ambient temperature (max/min)	+36°C/-25°C
▪ Average monthly humidity (min/max)	70%/90%
▪ Elevation above sea level	1m
▪ Wind speed	26 m/s
▪ Atmosphere	typical for refinery Grupa Lotos S. A. (marine, aggressive industrial, chemical and dusty)

4.4 Electrical supply parameters

Supply source available on site:

Frequency	50 Hz
Low voltage	230 VAC TN-S

5 Description

5.1 Basic assumptions

5.1.1 Factory-wide communication

System of factory-wide telephone communication is based on OmniPCX 4400 system.

Dispatcher's network is composed of several dozens small and medium telephone exchanges, configured as dispatcher's exchanges. It is characterized by application of complex system instruments, operating as dispatcher consoles and equipped with keys programmed as hotlines. Direct connections serve for quick and reliable communication with end instruments located most frequently on process plants, as well as other control rooms and points performing functions important for safety and protection (fire brigade, security service), and selected representatives of management.

Chosen dispatcher exchanges shall enable realization of teleconference connections of wide functionality, which is unavailable within standard offer of telephone exchanges. The following features can be listed among them:

- from 30 up to 50 participants
- monitoring of teleconference participants state by its organizer,
- possibility for adding of further participants by organizer during ongoing teleconference (without disconnecting it)
- possibility of utilization telephone sets possessed by participants, as teleconference end instruments.

System development can proceed by networking of autonomous exchanges or distributing of equipment or individual users.

Distribution of system requires that part of non-autonomous equipment is to be installed in remoteness from main module. From logical point of view, this is a single telephone exchange.

Networking and distributing can by accomplished by means of various media, such as:

- interconnection of analogue exchanges
- interconnection of analogue exchanges over S0 or T0 contact, with use of QISK signalling protocol, or optional
- E1 link (2Mb/s)
- ATM 155Mb/s (rarely used)
- TCP/IP
- single- and/or multimode fibre optic

5.1.2 Main telephony functions

- Shortened number dial-in
- Meeting reminder
- Linked object, defining for specific user
- Linked object, modifying for specific user
- Automatic call-back when line is busy
- Automatic call-back when line is free
- Middleman connection
- Immediate call redirection
- Call redirection on busy / no answer
- Call redirection to area number or hunt group, voice mail, operator, etc.
- Call take-over

- Holding of busy area / line number
- Various ring tones, depending on hierarchy levels
- Direct access to services (voice mail, etc.)
- Function „Do not disturb”
- Putting calls on hold
- Hunt groups
- Catalogue
- Internal / external connections
- Last number redial
- Conference connection
- Call protection
- Personal code
- Storing and redial of external numbers
- Trilateral conference
- Transfer during call on busy / free end instrument

5.1.3 Programmable multifunctional system telephone sets

In dispatcher’s telephony system, use of adequately programmed, multifunctional digital end telephone sets is recommended, in order to gain increased effectiveness on work post. These terminals operate on multimedia digital link.

5.1.4 Dispatcher exchanges and distributed / remote modules „Voice Hub” optional

Depending on realized local needs, small or medium telephone exchange is used in dispatcher’s configuration, or optional distributed / remote modules. A module can be used as self-contained system, traditional Crystal / IP or small node of local network.

Hardware cabinet of the module shall contain:

- Universal slots for required number of ports (analogue/digital)
- Dedicated slot of call server
- Power supply with battery pack in buffered configuration
- Modem for remote maintenance (option)
- Internal connectors enabling easy installation (MDF, Ethernet, RS232, alarms, etc.)

Cooperation with adjacent exchange (main module) can proceed over analogue or digital links, with use of telephone, fibre optic (single- and multimode) cables, and as option in case of telephone cables with use of digital regenerators along with power supply for exchange interconnections 2 Cu channels.

5.1.5 DECT devices

In justified cases and in agreement with GLSA, use of wireless telephone sets based on DECT technology is allowed.

5.1.6 DECT telephone services

Personnel moving around factory buildings benefits from the same level of services, as on fixed work posts.

- Caller name identification
- Multi-line feature
- Signalling by means of telephone set icons
- Programmable keys
- Transparent access to all telephone services
- Object monitoring
- Short Message Service
- Voice mailbox.

5.1.7 Dispatcher communication

Dispatcher industrial telephone communication is based on individual configuration variants on:

A. local telephone exchanges or optionally (*after adjusting it with GLSA*) local / remote modules of distributed OmniPCX 4400 system with use of industrial telephone sets of Ex/JP design.

B. local telephone exchanges or optionally (*after adjusting it with GLSA*) local / remote modules of distributed OmniPCX 4400 system with use of industrial telephone sets of Exia/JP design.

C. dispatcher – conference equipment (successively replaced, according to p. A – B)

5.1.8 Architecture of dispatcher telephone communication system PMX (managing)

Dispatcher telephone communication for managing purposes shall feature hardware architecture adapted to technical and organizational requirements of individual factory structures, relating to administration and production on management and supervision level. It is recommended for this communication to enable creation – beside dispatcher's connections, also collective conference connections with active participation of attending users. Selected equipment (factory dispatcher) shall enable realization of wide teleconferences of full functionality (automatic teleconferences, session recording, possibility for adding participants in course of teleconference).

5.1.9 Architecture of dispatcher telephone communication system PMX (process)

Dispatcher industrial telephone communication for process purposes shall feature hardware architecture adapted to process engineering requirements of factory structure(s), connected with operating service on supervision level, providing the following basic functional features:

- Bi-directional connections in relation dispatcher – end instrument within system
- Emergency operator calling by end instrument of system
- Acoustic and optical emergency calling of end instrument or group of end instruments by operator
- Connections of system to PABX network by operator and from end instrument
- Possibility of connections' and calls' recording
- End instruments of the system shall have acoustic signalling devices, or optionally (*after adjusting it with GL*) shall be in speakerphone version, at least for reception of messages
- Optionally (*after adjusting it with GL*), possibility of alarm signals emission by operator to places endangered with hazard to people and environment

5.2 Design directions

5.2.1 Basic components of dispatcher telephone communication system PMX

Dispatcher telephone communication for managing purposes shall include the following, basic components:

- telephone exchange operating in dispatcher's configuration or optionally (*after adjusting it with GL*):
  - Software separated module of OmniPCX 4400 system
  - Multifunctional programmable system telephone sets
  - Multifunctional programmable analogue telephone sets
  - Conventional cable and/or fibre optic exchange interconnection networks
  - Network matching equipment: modems, regenerators, etc.

Dispatcher industrial telephone communication for process purposes shall include the following, basic components:

- for variant according to p. 4.1.1.7.A
- telephone exchange operating in dispatcher's configuration or optionally (*after adjusting it with GL*), software separated module of OmniPCX 4400 system
  - Multifunctional programmable system telephone sets
  - Industrial type telephone sets of intrinsically safe Exia design and reinforced enclosure Ex/IP
  - Industrial telephone sets of explosion-proof Ex/IP design
  - Industrial telephone sets of waterproof IP design
  - Conventional cable and/or fibre optic exchange interconnection networks
    - Network matching equipment: modems, regenerators, etc.
- for variant according to p. 4.1.1.7 B
- telephone exchange operating in dispatcher's configuration or optionally (*after adjusting it with GL*), software separated module of OmniPCX 4400 system
  - Industrial telephone sets of explosion-proof intrinsically safe design Exia, together with accompanying Station Equipment of Industrial Intrinsically Safe Telephony
  - Multifunctional programmable system telephone sets operating as dispatcher consoles
  - Computerised Dispatcher Stations – optionally (*after adjusting it with GL*)
  - Programmable telephone sets of intrinsically safe Exia design
  - Conventional cable and/or fibre optic exchange interconnection networks
  - Network matching equipment: modems, regenerators, etc.

The following, basic components of PMX dispatcher telephone communication system can be distinguished:

- Station equipment
- Line equipment

5.2.2 Station equipment

5.2.2.1 Dispatcher's exchange, or software separated module of OmniPCX 4400 system

Telecommunication system must be composed of two, clearly separated parts: software controlling communication and hardware components serving communication interfaces.

Required communication platform shall ensure links necessary for integration of multimedia and business applications by means of open standard interfaces, with consideration given to up-to-date IP technology standards, and WWW in the future.

The system shall offer high flexibility and shall serve various configurations and types of "media gates". The same hardware components shall enable many various architecture configurations:

- centralized architecture of PBX type with mixed centralized / distributed architecture in commutated network or in packet network:
  - Commutated network:

    Telephone cable

    Single- or multimode fibre optic cable
  - Packet network

    LAN / WAN IP network

Proposed system shall be based on „open" and standardized software architecture, facilitating functional integration with IT systems. Real-time software controlling of communication shall be based on LINUX or UNIX operating system.

Connections to terminal:

- Analogue interface for analogue stations and fax machines
- Digital interface for company stations
- ISDN 2B + D, interface bus for S0 station
- IP telephony stations
- IP application stations.

5.2.2.2 Software separated local/remote distributed module of OmniPCX 4400 system

Modern telecommunication server used (PABX exchange) Alcatel OmniPCX Enterprise, after each extension shall be able to become central unit controlling whole communication network. OmniPCX server is able to serve even up to approx. 50000 users, and its modular structure ensures uniform serving of small (10 – 50 NN), medium (50 – 200 NN) and large locations.

It is therefore justified to equip small and medium locations with so-called local/remote modules, controlled from central communication server. Control signals and voice can be in this case transmitted over LAN/WAN network with IP protocol, ISDN, digital subscriber line or other media.

In order to facilitate integration of system in structural plan, „multimedia gates" can be packed as standard 19-inch enclosures arranged in stack and standard RJ45 connectors, in order to enable voice and data consolidation by means of unified cabling plan.

Furthermore, the system shall enable gradual evolution or migration of its architecture from centralized PBX type to wholly distributed IP architecture, utilizing again for this purpose existing material, including terminals, and without interruptions in operation. Within distributed IP architecture, "multimedia gates" must be configured along with adequate resources (i.e. VoIP codecs) for serving of expected traffic incoming from configured terminal points (non-IP) of system, including:

- Digital stations,
- Analogue stations,
- Cordless services: base radio station for PWT/DECT type (according to requirements),
- Analogue links to public network (PSTN),
- Links of ISDN and T1/T2/T0 type to public network (according to requirements),

- Automatic digital and/or analogue tie-lines PBX-PBX (according to requirements)
- Tie-lines: full or partial T1/T2 ISDN.

5.2.2.3 Multifunctional programmable system telephone sets

a. General data

Selection from assortment of system digital telephone devices and optionally IP stations, shall be conditioned upon many various requirements, starting from basic equipment for use in common area, up to equipment of professional class.

Easy creation of telephone device for dispatcher's post shall be also possible.

b. Functional features

Digital system terminal (telephone set), shall have the following features:

- Feeding through twisted pair
- Maximum operational distance approx. 2 km (on twisted pair with wire diameter of Cu Ø 0,8mm)
- Distribution over single pair, optional (after adjusting it with GLSA) over two pairs
- Communication with transmission speed 256 kb/s or higher between terminal and equipment,
- Additional analogue or ISDN interface.

Additional analogue interface must make available ring generator, supply, in the following configurations:

- Common or different extension number
- Dial-in from analogue interface apart from main terminal
- Dial-in from analogue interface for main terminal

IP terminal (telephone station), optional (*after adjusting it in writing with GLSA*) shall be similar to digital station in terms of appearance and functionality, and shall have the following functions:

- Remote supply by means of 802.3af standard, or local 120/230 V
- Interfaces to 10/100 Ethernet switch with automatic detection function
- PC port
- Fixed IP address or dynamically assigned by DHCP client server,
- SNMP agent (device control protocol) integrated with MIB 2 (data coding protocol).

In case of gradual evolution, or migration from centralized PBX architecture to completely distributed IP architecture, absolute coherence of services available for digital and analogue stations is required, and mixing of various telephone sets shall also be possible in configurations manager/secretary, groups of "hunt group" type, supervision, etc.

c. Applications of terminals (telephone stations) to be selected after obtaining approval from GLSA

The model recommended for network operator:

- Display,
- Contrast adjustment,
- Alphanumeric keyboard,

- Audio monitoring modes without hooking-off of telephone receiver and with voice amplification,
- LCD signalling icons associated with each key,
- Personal catalogue,
- Telephone receiver volume regulation,
- Integrated Help, assisting user with programming,
- Teleconferences
- Unit extension modules
- PC port in IP configuration (optional).

Apart from whether the station is system digital or IP telephone station, it shall enable user-friendly operation without any differences in interfaces and services. The terminals, including those of lower class, shall be equipped with keys that can be directly programmed by user. Those keys shall enable connection of many functions in single chain (e.g. call-back code + external number, etc.).

In order to enable solving of specific organizational solutions or problems of monitoring in some locations, blocking of some keys on terminal may be required in order to freeze specific configurations (profiles).

5.2.2.4 Multifunctional programmable analogue telephone sets

a. General data

Selection from assortment of analogue telephone devices shall be conditioned upon many various operational requirements and technical conditions on installation site.

Currently used analogue terminals (stations with decade dial-in, multi-frequency stations, modems, faxes, etc.) must find reflection without losing of functionality or options. Commonly used devices shall be able to answer to pulse dial-in signals, or to DTMF signals, and to automatic recognition of received signal type.

b. Basic functions

- Last number redial
- Extended last number redial
- Connection hold-up „HOLD”
- Inter-exchange break „PAUSE”
- Calibrated break „FLASH”
- Programming of telephone set settings
- Setting of dial-in mode
- Language selection
- Setting of local code

5.2.2.5 Industrial telephone sets of intrinsically safe Exib design with reinforced enclosure Ex.

Communication equipment foreseen for utilisation in explosion hazard zones shall have ATEX certificates.

a. Destination of telephone set

The telephone set is destined for use in rooms and areas in which dangerous explosive atmospheres of gases and vapours can arise in explosion hazard zone Z1, from mixtures of gases, vapours or mists of sub-group IIB and IIA and temperature class T1-T4, for communication in dispatcher systems. Telephones on production area shall be mounted with green cover (see attachment 49 in specification 3020).

b. Components

Characteristic outfit of the telephone set shall include:

- Acoustic signalling device
- Optical indicator

The telephone set shall feature high call effectiveness, even in places of high noise and dust level.

c. Basic parameters

- Supply voltage of the system 48V DC
- Reference equivalent on transmission: -1 up to + 6dB
- Reference equivalent on reception: -8 up to 0 dB
- Attenuation of local effect: min. 15 dB
- Intensity level of call signal tone: min.80 dB
- Intrinsic safety: zone Z1 group IIA and IIB
  Class T1-T4
- Degree of protection: IP 54
- Operating temperature range -35C up to +40C

d. Basic functions

The telephone set shall be adapted to cooperation with PABX telephone exchange with possibility of PULSE or DTMF dial-in mode selection, according to detailed requirements. In justified cases application of end instruments without keypad is allowed. This remark applies to p. 4.2.2.6, 4.2.2.7 and 4.2.2.11.

5.2.2.6 Industrial telephone sets of explosion-proof Exib design with reinforced enclosure Ex /IP

a. Destination of telephone set

The telephone set is destined for use in rooms and areas in which dangerous explosive atmospheres of gases and vapours can arise in explosion hazard zone Z1, from mixtures of gases, vapours or mists of sub-group IIC and temperature class T5-T6, for communication in dispatcher systems.

b. Components

Characteristic outfit of the telephone set shall include:

- Acoustic signalling device
- Optical indicator

The telephone set shall feature high call effectiveness, even in places of high noise and dust level.

c. Basic parameters

- System supply voltage 48V DC
- Reference equivalent on transmission: -1 up to + 6dB

- Reference equivalent on reception: -8 up to 0 dB
- Attenuation of local effect: min. 15 dB
- Intensity level of call signal tone: min.90 dB
- Intrinsic safety: zone Z1 group IIC
- Class T1-T6
- Degree of protection IP 66
- Operating temperature range -35C up to +40C

d. Basic functions

The telephone set shall be adapted to cooperation with PABX telephone exchange with possibility of PULSE or DTMF dial-in mode selection, according to detailed requirements.

5.2.2.7 Industrial telephone sets of waterproof design IP

a. Destination of telephone set

The telephone set is destined for use in rooms and areas where harsh environmental conditions are present, for communication in dispatcher systems.

Telephones on production area shall be mounted with green cover (see attachment 49 in specification 3020)

b. Components

Characteristic outfit of the telephone set shall include:

- Acoustic signalling device
- Optical indicator

The telephone set shall feature high call effectiveness, even in places of high noise and dust level.

c. Basic parameters

- System supply voltage 48V DC
- Reference equivalent on transmission: -4 up to + 4dB
- Reference equivalent on reception: -8 up to 0 dB
- Attenuation of local effect: min. 7 dB
- Intensity level of call signal tone: min.85 dB
- Degree of protection: IP 65
- Operating temperature range -35C up to +40C

d. Basic functions

The telephone set shall be adapted to cooperation with PABX telephone exchange with possibility of PULSE or DTMF dial-in mode selection, according to detailed requirements.

The following characteristic functions are recommended:

- Possibility of last number redial
- Possibility of so-called „shortened dial-in" of min. three numbers stored in direct memory
- Possibility of volume level regulation in handset by approx. 6 dB

5.2.2.8 Equipment of Industrial Intrinsically Safe Telephony Exia

a. Destination of the system

The system shall enable realization of quick direct dispatcher and telephone communication:

The system shall be adapted to operation in harsh industrial conditions, i.e. places of high noise level, high humidity, as well as in areas endangered with explosion of fuel vapours or gases.

b. Components

Basic components of the systems are:

- intrinsic isolation cages with line units
- programmable telephone sets – signalling devices
- computerised dispatcher posts

Each of cages shall contain line units and controller, which is connected to all individual units by lines for analogue signals, and internal serial bus for digital signals.

Line units shall be adapted to connection from one hand to subscriber's equipment of telephone exchange, and from the other hand, through intrinsically safe subscriber's lines – to programmable telephone sets and optionally to telephone sets – signalling devices.

c. Basic parameters

- Minimum capacity: 16 NN
- Maximum capacity: 194 NN
- Buffered supply : 48V DC
- Supply of dispatcher console: 230VAC guaranteed
- Level of call signals: 0,775V (0dBm),
- Irregularity of frequency characteristics
- in band 300 - 3400 Hz: max ±3dB,
- Coefficient of harmonics content: max 2,5%,
- Operating temperature range: from +50ºC up to +400ºC
- Input resistance of telephone line: max. 600Ω
- Input impedance of telephone line for 1000Hz: 600±50Ω
- Number of dispatcher communication channels: 1
- Number of telephone line inputs: 2
- Number of call recording channels: 2
- Number of call channels: 1

Number of intrinsically safe isolation cages with line units for large systems shall not be less than 4 to 6, and number of telephone sets – signalling devices 64 up to 96.

d. Basic functions

With preservation of all capacities of telephone sets – signalling devices, the system shall provide additional functions, directly performed, optionally with by-passing of telephone exchange PABX:

- Calling of dispatcher in emergency mode
- Calling of dispatcher in normal mode (operational)
- Dispatcher, individual and group transmitting, directly performed, with bypassing of telephone exchange, *optional*
- Possibility of sending messages to various groups of telephone sets – signalling devices, *optional*
- Listening watch of surrounding of arbitrary signalling device included in system, *optional*
- Control (switching on and off) of public addressing alarm signal, *optional* (individual and group)

Configuring of users groups, *optional*, including the following data:

- Number and name of group,
- Group status (ordinary, automatic demanding dispatcher's acceptance, or with immediate realization)
- Number of lines belonging to specific group
- Edition of numbers and names of lines (users)
- Blocking of damaged or not used lines
- Signalling of operational state for each system line, on screens of dispatcher posts
- Generation of files with reports, registering course of system operation. Such files are stored in computers of dispatcher posts.

Automatic recording in time function, on two computers, of calls performed during alarm condition of the system and possibility of other calls recording – on dispatcher's request.

5.2.2.9 Dispatcher consoles (*used after obtaining of written adjustment with GLSA*)

a. Destination of the system

Dispatcher's console is required for visualisation of operating conditions of all alarm lines in the system, as well as for communication of dispatcher with arbitrary dispatcher line, or group of lines. The console shall provide teleconferences as option.

b. Components

The console shall be produced in modular enclosure foreseen for installation on dispatcher's table. Modularity of the console shall ensure minimum capacity for 16 line pushbuttons and enable further extension Nx16 up to maximum capacity for the standard.

The console shall consist of line part and group part.

c. Basic parameters

- capacity: from 16 lines
- resistance of dispatcher line input: max. 600Ω
- impedance of dispatcher line input: 600Ω +/- 25%

- nominal level of signals: 0 dBm
- gain coefficient of microphone channel: min. 40 dB
- Central supply with voltage 48V DC from system supply

d. Basic functions

The dispatcher shall have possibility to carry on call in "simplex" mode with use of microtelephone set, or by means of microphone and loudspeaker.

Line pushbuttons along with selective pilot lamps corresponding to each monitoring line, shall belong to line part. With use of line pushbutton, dispatcher shall have possibility of connecting himself to each dispatcher's line in arbitrary moment. Pilot lamps inform about current condition of dispatcher's line (idle condition, telephone call being carried on by user, dispatcher's calliing in normal mode, dispatcher's calling in emergency mode, transmission from dispatcher to user, state of user call with another dispatcher, failure condition of user line).

The following pushbuttons and lamps corresponding to them shall belong to the group part of the console: transmission of individual and group (cluster) alarms, transmission of established verbal individual and group (cluster) messages, transmission of individual and group calling signals, transmission of dispatcher messages from dispatcher to user or to group of users. The following elements are also located in the group part of the console: alarm condition cancelling pushbuttons, call recording starting, switching over from main (A) console to auxiliary (B) console and inversely, switching off of call acoustic signalling and disconnecting of reserve lines.

5.2.2.10 Computerised Dispatcher Posts (*used after obtaining adjustment with GLSA*)

a. Destination of the system

The dispatcher post in the system may be PC computer. The dispatcher shall be able to carry on conventional telephone calls with use of factory telephone exchange or operator's exchange. Control of all system functions shall be accomplished by computer application, consisting of the three following parts:

- dispatcher console
- telephone console
- maintenance centre

b. System components

The basic elements of dispatcher console are:

- window of virtual line pushbuttons
- window of common pushbuttons
- window of telephone connections

c. Basic parameters

- WINDOWS XP PRO is recommended as operating system
- Each audio card shall enable connection of two telephone lines to it

d. Basic functions

PC based dispatcher console shall enable control of all functions, offered by the system.

Computer post shall allow for assigning one of the three following statuses to it:

- Maintenance post
- Dispatcher post
- Observation post
- Teleconference post as option

Each dispatcher post shall allow for converting it to maintenance post. Change of status shall be possible by entering of appropriate password by authorised person.

Possibility for additional computer connection shall be provided for the post in order to enable performing of maintenance functions by it. The dispatcher shall have possibility of transition between dispatcher's and telephone part by means of pushbuttons. Switching on and displaying of telephone part shall follow automatically after call reception on one of two connected telephone lines. Maintenance post shall ensure possibility of changes introduction into system configuration, such as: number and composition of users' groups, external devices activating alarm clusters, etc. It is required that access to maintenance post is protected with password.

5.2.2.11 Programmable telephone sets and telephone – signalling devices of intrinsically safe Exia design

a. Destination of system

Programmable telephone set or telephone– signalling device, used optionally (*after written adjusting with GLSA*), shall enable, beside of conventional telephone and alarm – dispatcher's communication, realization of several additional functions.

It shall be used for public addressing of alarms, verbal and sound messages transmitted through intrinsically safe telephone line, or previously recorded and stored in internal memory.

b. Basic parameters

- feature: EXiaI,/ EXiaIIBT3 or EXiaI,/ EXiaIICT3
- nominal level of signals: 0 dBm
- dial-in of numbers: tone - DTMF
- Allowable noise level in environment: max. 80dB
- Loudness of public addressing signals (at 1 m distance): nominal 90dB
- Minimum operating time for transmission of messages: 2h
- Attenuation of subscriber's line: max. 12dB
- Degree of enclosure protection: IP65
- Operating temperature range: from -40°C up to +40° C

c. Basic functions

Programmable telephone set or telephone– signalling device, shall enable carrying on of simplex mode calls with persons present in vicinity of signalling device, and after microtelephone hook-off, performing of telephone functions. Possibility of dispatcher's calling by means of ALARM and DISP. pushbuttons in emergency and normal mode shall be provided as well. It is recommended for the dispatcher to have possibility of listening watch of signalling device surroundings. Telephone set – signalling device shall be adapted to cooperation with arbitrary automatic telephone exchange with tone dial-in (DTMF), by means of line-separating units.
Equipment of network matching: modems, regenerators, etc.

Connections to terminal

- Analogue interface for analogue stations and faxes
- Digital interface for digital stations
- ISDN 2B + D, interface bus for S0 station
- IP telephone stations
- IP application stations

5.3 Electric supply

GLSA shall provide the Supplier with supply circuits, separated for feeding of telephone equipment, according to required power demand specified by the Supplier.

The Supplier shall ensure overvoltage protection of equipment. Such protection shall guarantees safety of equipment, as well as other components of system in case of impulse electromagnetic discharge. For important telephone switches power supply shall be provided from two sources.

5.4 Marking

Telephone equipment shall be marked with name and logo of manufacturer, in order to ensure complete system integrity. Each device shall be equipped with label showing dedicated number of equipment according to documentation and numbering procedure of linked devices.

The label shall be printed by means of stamping on data plate. Data plates shall be made of stainless steel, non-corroding alloy or rigid plastic, and durably fastened to non-removable part or equipment frame. The Supplier shall submit proposal of label for GLSA approval prior to starting of production, according to GLSA standard N° 3030.

5.5 Services

The services that the Supplier shalls provide are as follows:

- implementation design
- system programming
- factory acceptance test and inspection
- packaging and shipment
- assembly on site
- functional tests and connections to other systems
- trial run of a system lasting from 7 to 28 days
- training of personnel (users, administrators and service staff) indicated by GL
- elaboration of maintenance and operation manual and procedure of proceeding in case of alarm signals
- maintenance during guarantee period.

5.6 Cables, wires, auxiliary items

All cables, wires, prongs, accessories and mechanical protective equipment shall be included in scope of Supplier delivery. Cabling of wired telephony system shall include all required connections to equipment provided by the Supplier. All cables and terminal strips shall be marked on each end, with use of marking system conforming to GLSA standard N° 6120.

All equipment destined for outdoor installation shall be delivered together with cable glands. The Supplier shall make selection of cable glands according to nominal diameters of cables, specified by their producer.

5.7 Documentation

Documentation shall include the following components:

1. Technical description, including:
   - description of existing equipment
   - description of newly designed equipment
   - description of operating principles (functional description of the system)
   - detailed description of system elements
   - list of relevant norms and other documents.
2. Equipment lists
3. Cable lists
4. Drawings:
   - description of graphical symbols
   - block diagrams
   - building layouts showing station and line equipment and cable arrangement on different floors
   - field layouts (geodetic maps) showing station and line equipment and signal/power cable arrangement for outdoor areas (e.g. process plants)
   - wiring diagrams (cabling)
   - single-line supply diagrams
   - drawings of console arrangement
   - assembly examples.
5. Operating, installation and maintenance instructions
6. As-built documentation, including revised drawings, reflecting changes introduced to equipment and wiring system.
7. Start-up checklist
8. Acceptance report

Prior to detailed designing commencement, the Supplier shall agree requirements for system (i.e. system functionality, location of equipment, cable routing) with GLSA representatives. Such adjustments shall be prepared in written form.

6 Relevant documents

Any "Technical Specification" issued by GRUPA LOTOS S.A. listed in Contract Files.

7 Norms and standards

It is in each case understood that quoted standards, regulations, directives and orders are of their latest editions, along with amendments, annexes and supplements in force.

7.1 Regulations

USTAWA z dnia 30 sierpnia 2002 r o systemie oceny zgodności (Dz. U. 2002 nr 166 poz. 1360) z późniejszymi zmianami. Tekst jednolity (Dz. U. 2010 nr 138 poz.935) z późniejszymi zmianami.

Rozporządzenie Ministra Gospodarki z dnia 21 sierpnia 2007 r. w sprawie zasadniczych wymagań dla sprzętu elektrycznego (Dz.U. 2007 nr 155 poz. 1089) z późniejszymi zmianami.

Ustawa z dnia 13 kwietnia 2007 r. o kompatybilności elektromagnetycznej **(**Dz.U. 2007 nr 82 poz. 556) z późniejszymi zmianami.

Rozporządzenie Ministra Gospodarki z dnia 22 grudnia 2005 r. w sprawie zasadniczych wymagań dla urządzeń i systemów ochronnych przeznaczonych do użytku w przestrzeniach zagrożonych wybuchem (Dz.U. 2005 nr 263 poz. 2203).

7.2 Norms

- PN-EN 60079-0 - Urządzenia elektryczne w przestrzeniach zagrożonych wybuchem gazów. Część 0: Wymagania ogólne
- PN-EN 60079-11 - Atmosfery wybuchowe. Część 11: Urządzenia przeciwwybuchowe iskrobezpieczne "i"
- PN-EN 60079-25 - Urządzenia elektryczne w przestrzeniach zagrożonych wybuchem. Część 25: Systemy iskrobezpieczne
- PN-EN 60079-10 (obie części) Urządzenia elektryczne w przestrzeniach zagrożonych wybuchem. Część 10: Klasyfikacja przestrzeni zagrożonych wybuchem
- PN-E-60529 - Stopnie ochrony zapewnianej przez obudowy (kod IP).
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8 Enclosures

- Attachment No 1, Block diagram - Intrinsically safe telephony equipment Exi
- Attachment No 2, Block diagram - Intrinsically safe telephony equipment Exi

9 Record of changes

No.	Date	Description	Introduced by
1		This specification entirely replaces the former LOTOS Group S.A. standard No. PR 07 380 with the same title.	K. Kowalczyk
2	30-11-2013 (rev. 1)	Review, update, standardize and changes to the Standard within scope of order No. OK/990/2012	Editorial board coordinated by T.Wróbel
-	31-08-2015	Page layout corrections, no contents changes.	T. Wróbel