SPECIFICATION Τ-2088 Γ

NODAL TELEPHONE EXCHANGES - PABX FOR THE TELECOMMUNICATION NETWORK OF IPTO (POWER LINE CARRIER-PLC NETWORK, PDH, SDH)

1. CONSTRUCTION CHARACTERISTICS

1.1 The required private automatic branch exchanges shall be used for the expansion of the existing IPTO private telephone network, comprising of power line carrier links, PDH, SDH and OTE leased lines and it is operating under the decadic (pulsed) system.

1.2 It must be taken into account that the required telephone exchanges will be installed in communication room of the high voltage transmission substations where high electrical fields are present.

1.3 The exchanges must be of the latest technology, digital type, TDM/PCM stored program controlled (SPC); they must operate under EURO-ISDN environment and must be compatible with ITU-T and ETSI European standards.

1.4 Storage and modification of the individual Software programs shall be carried out in EEPROMs or Compact flash or Hard disk through a portable programming unit (P.C.) either locally or remotely.

1.5 The necessary MODEM must be included.

1.6 The program as well as all sorts of commands must not be erased in case of 48 VDC power failure.

1.7 Each private branch exchange must be housed in a 19'' design ETSI metallic cabinet, floor – mounted, dust resistant and minimum height 1m.

1.8 The wiring terminations of the outgoing cabling, typical telephone grade cable, must be located in a special patch panel within the cabinet. KRONE type connections may be used.

1.9 The cables for outgoing use will be telephone type 0,6 mm diameter.

1.10 Capacity

Each PABX initially must be equipped with :

a. Local telephone subscribers 16
b. Trunk line connections (4W or 2w E & M .....24)

The initial capacity must have expansion capability at list 50%
The exchange must be able to support Tie line connections to PSTN and EURO ISDN.

1.11 Environmental conditions

Operation temper : -5° + 45°C
Humidity : < 95 %.

1.12 The power supply of PABX should be 48 VDC + ve ground.

1.13 The capacity of each exchange can expand by a minimum of 50% using plug-in modules.

1.14 E&M cards must be equipped with led indicators for each port to sign :

a. Operating status
b. The incoming and outgoing calls and pulses
c. Subscriber ALARM

2. OPERATIONAL CHARACTERISTICS

2.1 The PABX shall accept common handsets operating in pulse or tone (DTMF) mode. The allowed impedance of subscriber devices shall not be less than 500Ω per pair (a, b) for line with characteristic resistance of 600 Ω.

2.2 The requested exchange may accept analog TRUNK-LINES with four speech wires A, B, C & D, pulse send wire (M), pulse receive wire (E) and ALARM wires to and from the exchange. These analog TRUNK-LINES shall have the following characteristics:
2 wire private trunks and E/M signaling
4 wire private trunks and E/M signaling
Continuous signaling and pulse signaling
Useful band 300-3400 Hz
Input level : -10 dBm to + 6 dBm programmable
Output level : -10 dBm to + 6 dBm programmable

2.3 a. The entire 2-wire and 4-wire incoming and outgoing telephone dialling system, shall operate under 10 pulse/sec current pulses = 1 pulses 60 - 40ms or 50 - 50ms and may accept pulse series from 70 to 30 ms pulse and 30 to 70 ms pause. It may also adjust the pulses according to the PLC requirements from 50 to 66 ms pulse and 50 to 33 ms pause with continuous adjustment.

b. The same shall apply for current pulses of 20 or 25 pulses / second with 25 ms pulse, 25 ms pause and 20 ms pulse, 20 pause respectively.
The above mentioned pulses may be configurable only through the PC, not by specific memories of the individual boards and this adjustment shall be possible also when the PABX is in service.

c. These adjustments shall be carried out per trunk line, not per group of trunk lines accommodated on a single board.

2.4 Time from the seizure of the external trunk line of the trunk line up to the time the private branch exchange is capable of accepting current pulse shall not exceed 100 ms.

2.5 Automatic release of subscriber after configurable time (0 - 60 sec) after the seizure of the subscriber carrier, in case the subscriber does not proceed with dialling (release time out).

2.6 The architecture of the PABX shall be Non-blocking, (1024 time slots).

2.7 Provision shall be made for general calling more than one telephone subscribers specified by a calling code (common ring groups).

2.8 Signals: The voice signals emitted to the subscribers shall be produced from an adjustable 425 - 1000Hz tone; they shall be distributed in the following manner:

- Dialling signal : continuous tone
- Busy line signal : interrupted tone
- Free line signal : interrupted tone - same frequency as calling
- Call intrusion signal : weaker interrupted tone
- Repetition signal : on number redialling, an interrupted tone shall be heard at the frequency of the outgoing number (through selection tone during digit repetition).

2.9 Monitoring Alarm module: The private branch exchanges shall include a monitoring module collecting all trouble information of the individual modules; following suitable processing the following indications must be provided.
a. Local visual - audio signaling at the rack.
b.Possibility through three 110 VDC voltage - free contacts to transmit Major, Minor and General Alarms to remote locations.

2.10 It shall be capable to easily provide local isolation of subscribers, through manual switch if possible.

3. OPERATING CAPABILITIES

3.1 a. The PABX numbering scheme shall be up to 5 digits with identification of each digit. Therefore each subscriber shall be allowed one or more subscriber numbers, consisting of 1, 2, 3, 4 and/or 5 digits without limitation as to the use of any number in-between the existing 99999.

b. It shall be possible to allow selection, in addition to the five digits, before or after these 5, additional 1 ÷ 5 digits as Prefix or Suffix.
Following the 1:5 digits Prefix, will be able to receive the dial tone of the remote PABX and will continue dialling the next 1 ÷ 5 digits (pulses).

c. Furthermore it shall allow programming of non - repetition of prefix digits while the numbers following the prefix are repeated.

3.2 Programming of subscribers (telephones and tie lines) must be possible depending on the subscriber type and class of service, at least regarding the following categories:

- Telephone set with priority or not
- Tie lines connection with other PABX
- Direct dialing power line carrier , 4 wires + E & M (remote trunk)
- Decadic (pulsed) numbering scheme over power line carrier with repetition of none, one, two, three
and four digits.
- Power line carrier which may or may not accept the preceding priority code for repetition. It must be possible to block specific access subscribers to and from the private power line carrier network through E & M trunk lines.
Hence the interior subscribers (telephones) of the nodal private branch exchange may be grouped in to 2 categories:

a. Transit subscribers
b. PABX subscribers

3.3 The exchange modules shall include registers for minimum 4 digits in order to allow combination repetitions in pulse form, to the corresponding power line carrier with all the possibilities mentioned below, from which one may be selected.

a. After seizure of the branch (earth at M), it shall wait for special response signal (earth at E), from the remote PABX for initiation of pulse series
b. After seizure of the branch (earth at M limits) and prior to repetition of the pulse series, a software - configurable time shall be left, depending on the number to be repeated and the output characteristics (PLC type etc)
c. After seizure of the branch (earth at M), it shall wait for special response signal (earth at E), from the remote PABX; instead pulse series shall commence following an interval adjustable between 100ms÷1000ms.
d. The above mentioned adjustments are conducted through PC per trunk, not per trunk group.

3.4 It shall be possible to allow adjustment of the intervals between digit pulse series proportional to output characteristics. General example: No. 728 is repeated from output A following reception of response signal and at regular interval between digits.
However in case output A is occupied, then the number shall depart from output B without waiting for response signal, but following pre-configured time; in addition, it shall be possible to vary the duration of intervals.

3.5 It shall be possible to implement TIE-LINE (trunk line) hunting on telephone sets as well.

3.6 Furthermore, in cases of programmed trunk line hunting, number storage shall be retained after repetition to the first output in order to allow further repetition thereof to a second output in case the branch of the first output is occupied at subsequent stage (Double selection).

3.7 The command for number retransmission mode (none, full or partial) shall be dependent not only on programming of the subscriber type but also of the number.

3.8 The same as above numbers, in case they are output from other hunting branch, may be output through a different pattern, also dependent upon the branch, in addition the number.

3.9 The PABX shall be capable of digit modification on incoming and outgoing calls as well as the ability to decrease or increase the number of digits.

3.10 Trunk line hunting outputs shall not be necessarily sequential regarding the exchange's structure, i.e. in case an output has two groups of dialling numbers, X as primary and Y as secondary, another output may have Y as primary and X as secondary.

3.11 In addition to the numbers allocated to each subscriber provider under the general numbering scheme, it shall be possible to also provide to each of them a 3- digit number without repetition characteristics thereof. These numbers may be sequential and may thus identify the position of each subscriber provider (e.g. the n-th sub. provider with respect to the exchange's structure, also identifies the 3-digit "code" through which activation of the corresponding trunk line is effected, yet without conducting repetition of digits. This capability is intended to remotely manage the trunk line branches in conjunction with the exchange (test number).

3.12 The PABX shall provide intrusion and forced release capability. The intrusion capability, for specific subscribers (programmable) shall be permanent, without the need for any operation by the subscriber in question. For instance: After sending of the number's pulse series and after listening to the busy tone, a pulse series of 1-10 or 28 pulses is relayed at the operation of the associated telephone set key. In this case the connecting circuits are not released; the caller intrudes to the current session, connecting the warning signal as well; in this phase, the priority used, through dialling of one digit, may release the initial session while the latter's call (priority) carries on, either to a local telephone or to an other PBX's telephone connected to the former private branch exchange through a carrier line, however intrusion and disconnection must be also conducted to the latter line.
Hence, intrusion and forced release shall be carried out not only on extensions but on TIE LINES as well (4 wire with E & M), (intrusion force release).

3.13 Programming shall be possible so that for specific subscribers (telephones or Tie lines) intrusion or forced release by a third party may not be possible. Furthermore the PABX may not send to a specific output (line) the intrusion pulses.

3.14 The PABX shall be capable of automatic Test-Reset to the Tie-lines regularly, in order to prevent blockage of the latter by interference or other causes.

3.15 The PABX shall be capable of isolating a single subscriber.

4. GENERAL REQUIREMENTS

4.1 Bidders, in addition to other supporting documents, shall append relevant documentation (brochures) stating that the proposed unit is designed and intended for use as a PABX suitable for use in the power line carrier private telecommunications network over the high voltage lines (150kV and 400kV).

4.2 Training of ten (10) technicians for five (5) days, at the IPTO premises must be included in the offer.

4.3 The aforesaid bid shall include a list of proposed spare parts for the uninterrupted operation of the unit.

4.4 In case the proposed equipment is not already in service by IPTO, a demonstration of the equipment shall be required, as well as trial of the requested functions at IPTO premises during the technical evaluation process. The submitted sample should be of the exact type with the offered and should be accompanied by all the relevant certificates.

4.5 The supplier must provide a warranty of at least two (2) years for each PABX from the equipment delivery date.

4.6 Bidders shall submit the following information, to be taken into account for technical evaluation of the bids.

a. Statement confirming sales to electric utility companies of at least 10 pcs in the last 4 years, accompanied by full Buyer information (company name, mailing address, telephones, FAX, e-mail).
b. Statements by the respective Buyers indicating that the materials (or equipment) are installed and satisfactorily in service without problems during the last 2 years

The above mentioned statements shall refer to quantity, purchase date and installation date, in other case they shall be rejected as incomplete.