IGS-M-IT-001-2(0) Feb.2007

APPROVED مصوب

مدیریت پژوهش وفناوری

امورتدوین استانداردها

IGS

Iranian Gas Standards

مشخصات فنی خرید

مشخصات فنی مراکزتلفن اتوماتیک ،قسمت اول مراکزکم ظرفیت (کمتراز ۱۰۰ شماره)

Technical Specification for Small Capacity PABX , Part(1) : less than 100 extensions

Fax:(9821)-8131-5679 igs@nigc.ir

دفتر مدیرعامل

شرکت ملی گازایران

تاریخ: ۱۳۸۷/٤/۲۳
شماره: گ.۰/دب/۰/۲۰۰-۱٤۸۰۷

ابلاغ مصوبه هیأت مدیره

به: مدیر محترم پژوهش و فناوری

از: دبیر جلسات هیأت مدیره

باسلام،

باستحضار میرساند در جلسه ۱۳۲۲ مورخ ۱۳/ ۳/ ۱۳۸۷ هیأت مدیره، نامه شماره گ ۹/۰۰۰/۲۳۱۸۱ مورخ ۸۷/۲/۲۵ مدیر پژوهش و فناوری درموردتصویب نهایی استانداردهای IGS-M-IT-001-1(0) و IGS-C-PL-025(0) و IGS-M-CH-043(0) ارجاعی از مدیرعامل شرکت مطرح و مورد تصویب قرار گرفت.

ابراهیم رئیسی

رونوشت: مدیریت محترم عامل و قائم مقام رئیس هیأت مدیره.

: اعضای محترم هیأت مدیره/ مدیر محترم پالایش گاز / امور حسابرسی داخلی/ روابط عمومی/ امور بازرسی وپاسخگویی به شکایات.

۱٤۸۰۷

1. Scope

Gas industry require productive, reliable, safe and robust communication networks to interconnect all operational facilities and personnel, transporting voice, data and video in real time. To receive this purpose, coordination of switch specification is very important.

As a rule, the PABX shall be approved by the competent authorities of the company concerned.

This document defines minimum requirements for the supply of a PABX, (less than 100 subscribers) in order to make sure that all aspects of technical requirements of a product are covered and can be verified as complying with specified performance requirements.

2. Normative References

1. ITU-T: International Telecommunication Union-Telecommunication (Series Q & E)
2. IEEE: Institute of Electrical and Electronic Engineering

3. Symbol and Abbreviated Term

CAS: Channel-Associated Signaling

Co: Central office

DTMF: Dual-Tone Multi Frequency

E&M: reciEive and transMit

FSK: Frequently Shift Keying

FX: Foreign eXchange

LOM: List Of Material

LOP: List Of Price

Mbps: Mega bit per second

SOC: State Of Compliance

PABX: Private Automatic Branch eXchange

PCM: Pulse Code Modulation

PRI: Primary Rate Interface

TCI: Telecommunication Company of Iran

TDM: Time Division Multiplexing

UPS: Uninterruptible Power Supply

4. Technical Requirement

4.1. Telephone Exchange Characteristic and Design Concept

4.1.1. The telephone exchange shall be compatible with latest ITU-T recommendation and IEEE standards.

4.1.2. The telephone exchange shall be fully digital.

4.1.3. The telephone exchange technique shall be PCM/TDM based on A-law and μ-law.

4.1.4. The traffic of telephone exchange shall be in the access layer with Erlang 0.5, and in the center of switch with Erlang 1.0. (Non Blocking)

4.1.5. The telephone exchange shall be compatible with existing digital telephone exchanges in the NIGC telecommunication network and TCI network.

4.1.6. The structure of telephone exchange shall not be PC base.

4.1.7. Each board of telephone exchange shall be can replaceable in each slot unless power slot. (universal slot)

4.1.8. The telephone exchange design shall be hot plugged.

4.1.9. The telephone exchange design shall be modular. (Hardware and software) in such a way that, expansion of telephone exchange capacity shall be done easily and without any interrupt for service's subscriber.

4.1.10. The design of any module shall be independent from another module, so if any module damaged another module shall not damage.

4.1.11. All internal telephone exchange events shall be stored as online in two points which may assess and to be forwarded when required.

4.1.12. All parts in telephone exchange shall be protected against over voltage and current.

4.1.13. Flash memory usage shall have first priority in switch design and if there is used any EPROM, the place and percentages of used shall be mentioned.

4.1.14. All subscribers shall be able to use dial pulse and/or tone without any restriction.

4.1.15. The telephone exchange shall be equipped with internal music circuit which may have at least two types music and to be selected by software.

4.1.16. All analog subscriber lines of telephone exchange shall be completely compatible with various standard telephone sets.

4.1.17. All analog subscriber lines shall have 1200 Ω loop-resistance and to be able to provide 1800 Ω impedance when required.

4.1.18. Each of subscriber cards shall be at least with 8 and at most with 16 subscriber line circuit

4.1.19. The telephone exchange design shall be in such manner that power card connectors have different structure from other connectors and may not be replaced with each other.

4.1.20. The telephone exchange expansion to 30% capacity shall be in such a way that without any required additional equipment such as shelf, power card, etc and only with adding subscriber card can be expanded.

4.1.21. Numbering plan for extension and/or subscriber lines internal shall be expandable with minimum four digits and also be able to support assigning subscriber access code to special services and trunks to minimum 3 digits.

4.1.22. The Telephone Exchange design shall be in such a way that digit accept to 15 digits will be possible, based on ITU-T recommendation E.163 and E.164.

4.1.23. The telephone exchange shall be able to connect the following different lines and/or trunks:

- Urban Subscriber lines
- FX lines
- E1 – Links (2Mbps)
- CO and E&M Analog trunks

4.1.24. The telephone exchange shall be able to supported different signaling types of analog CO, E&M, digital PRI and 3-bit CAS for connection to telecommunication network.

4.1.25. The telephone exchange shall be able to automatic answering and operator answering to lines.

4.1.26. Telephone exchange shall be designed in such a way that, have to be controlled and remotely managed (by modem and network) and possibly can recover its software failures through it.

4.1.27. Telephone exchange shall be designed in such a way that power consumption for each of active subscriber line be less than 0.8 watt.

4.1.28. Telephone exchange shall be designed in such a way that required hardware for minimum 80% of services will be sufficient.

4.1.29. Telephone exchange shall be able to maintain stored information in the system during power loss and battery failures.

4.1.30. Telephone exchange shall be designed in such a way that if external synchronization signal be lossed; telephone exchange shall continue its service operation with internal synchronization signal and when that synchronization signal will be received, again automatically to switch to external synchronization signal without any telephone exchange service effects.

4.1.31. The traffic of each trunk shall be at least equal with Erlang 0.8.

4.1.32. Telephone exchange racks shall be less than 2m–height with oven colored and shall be able to be fixed with telephone exchange room floor.

4.2. Software and Management Telephone Exchange

4.2.1. All application and executable telephone exchange softwares shall have back up version on CD, flash or etc.

4.2.2. All telephone exchange softwares shall have various changeable passwords in its different levels.

4.2.3. Telephone exchange shall be able to present 100% of all requested software services for all subscribers.

4.2.4. Telephone exchange shall be able to vary its all timing parameters by software.

4.2.5. O&M softwares design shall be user friendly.

4.2.6. There shall not be any restriction in path creation and path classification.

4.2.7. There shall not be any restriction in services assignment and subscriber classification.

4.2.8. The telephone exchange shall be able to define different zone

4.2.9. There shall be all software and hardware possibilities for CLIP (caller ID presentation) service for all subscribers without any restriction.

4.2.10. There shall be different telephone exchange reporting forms such as internal call, intra city and inter city calls, in terms of time, cost, special telephone number and etc.

4.2.11. There shall be possibility to hold malicious call detection on all lines including internal & external.

4.2.12. Telephone exchange shall present caller ID in forms of FSK and DTMF.

4.2.13. Telephone exchange shall be able to present charging bills to all subscriber and its connected trunks.

4.2.14. Telephone exchange shall be able to record all subscribers call data including internal, intra city, inter city and international calls for at least 6 months during.

4.2.15. Telephone exchange shall be able to store data that mentioned at section 4.2.14 as online in two points.

4.2.16. Minimum required information which telephone exchange shall be able to store about subscriber calls are as follows:

- Data (yy.mm.dd) in both forms of solar hegira and Christina calendar.
- Call origination time (instant of call connection)
- Call duration
- Type of call (internal, intra city, inter city with different access code and international calls).
- Calling party number
- Called party number

- Trunk channel number which has set up call (if it is not an internal call)
- Usage zone

4.2.17. There shall be telephone exchange possibility for defining separate and various groups of subscribers and also possibility for registration of these group calls.

4.2.18. There shall be timer definition with software adjustment for all telephone exchange subscribers & trunks.

4.2.19. Telephone exchange shall have both solar hegira and Christina calendar dates which will be software selectable by operator and required dates can be registered in all reports.

4.2.20. There shall be possibility for changing internal subscribers and telephone exchange connected trunks data-base fields inform of software.

4.2.21. Management telephone exchange or supervisory must have at least two access layers. (operatory-supervisory)

4.2.22. Telephone exchange shall have connectivity capability to PC's (personal computers) via relevant interfaces.

4.2.23. The telephone exchange shall have traffic calculation capability in specific and determined time intervals in order to present following statistics:

- No. of internal call setup times statistics
- No. of call setup times statistics
- No. of call setup times with trunks statistics
- No. of call setup times by using all existing offered telephone exchange services statistics

4.2.24. The telephone exchange shall have PRI signaling multirete and single mode and shall be based on latest ITU–T recommendation.

4.2.25. The management of telephone exchange shall be in such a way that possibility for creation of failure rate graphs in the telephone exchange be exist generally in comparison.

4.3. Operating Environment Boundaries, Limit & Exclusions

- Temperature: $5\ ^{0}$ C to $45\ ^{0}$ C
- Relative humidity: 90%

4.4. Facilities Offered to Users

The telephone exchange shall have the following features:

- Call Forwarding, All Calls
- Call Forwarding, Follow Me
- Call Forwarding, No Answer
- Call Forwarding, To Co Line
- Call Transfer
- Call Waiting
- Direct Call Pickup
- Group Call Pickup
- Call Back
- Call Hold
- Call Queuing
- Automatic ring back
- Conference call
- Assign timer for call duration
- Music on hold

- Outgoing call retraction
- Incoming call restriction
- Account Code Entry
- Alternate Direct Trunk
- Answering Direct Trunk
- Automatic Callback Busy (Camp On)
- Automatic Route Selection (ARS)
- Caller ID Service
- Delay Ringing
- Dial Type Selection
- Do Not Disturb (DND)
- Do Not Disturb Override
- Emergency Call
- Hot line
- Executive Busy Override
- Flash
- Force Party Release
- Hold Recall
- Music on Hold
- Night Service
- Operator Call
- Quick Dialing
- Ringing Tone Selection
- Station Message Detail Recording (SMDR)
- Timed Reminder (Wake – Up Call)
- Toll Restriction
- Trunk Access Code
- Power failer transfer

- Direct inward dialing (DID)
- Direct out ward dialing (DOD)
- Caller ID on call waiting
- Optionally Boss/Security service

4.5. Peripheral Equipment

4.5.1. Operator Console

Operator console shall have the following attributes:

4.5.1.1. PC or desktop model.

4.5.1.2. At least Positioned 50 Meter in exchange distance

4.5.1.3. Equipped to display and/or monitor with alphabetic letters (Persians and English), in order to indicate lines status, trunks and subscriber's characteristics, subscriber's class of service, time (date & hour), number of incoming line on hold and searching in exchange phonebook.

4.5.1.4. Real time displaying telephone exchange alarms status and possibly displaying physical location on the system.

4.5.1.5. Shall be equipped with functional keys, which will be required by operator for transfer, call hold, call park and etc operations.

4.5.1.6. Whenever that number of incoming lines is much, the console shall not become busy and shall be hold the incoming lines. (Call waiting).

4.5.1.7. Changeable as manually Day/Night mode

4.5.1.8. Line return ability, i.e. in the line transferring and no answering by subscriber, after a given time duration which shall be defined in the telephone exchange must call back to the operator console.

4.5.1.9. The operator should be able to use of handset.

4.5.1.10. All incoming calls will preferably be ringed on one key.

4.5.1.11. Should be connected to the telephone exchange without any local power supply, by one copper pair line.

4.5.1.12. One RS-232 port for firmware upgrading shall have been access.

4.5.1.13. Announce sending ability to a given line, if it is required.

4.5.1.14. Whenever operator making an error operation, the special key for line recovery should be availably.

4.5.1.15. Ability of Redial.

4.5.2. Power Supply

Offered power supply system shall have the following features:

4.5.2.1. Switch mode

4.5.2.2. Operable with 220 ± 15 Volts AC incoming voltage.

4.5.2.3. Output voltage and current presenting with proportional to the telephone exchange.

4.5.2.4. Protection against over load and high variations in the input and output voltage and currant, sparkling and electrical frequency.(Needful equipment shall be specified by bidder in LOM)

4.5.2.5. Emergency power system or backup buttery at least for 8 hours full operation.

4.5.2.6. Backup battery features: dry, rechargeable

4.5.2.7. Number of back up batteries proportional with the power consumption of switching exchange. (Minimum operation time shall be specified in LOM.)

4.5.2.8. Battery charge and recharging shall be done by telephone exchange automatically.

Note **:**The bidder shall provide sufficient Number of UPS or inverter for O&M computers and printers and it shall be mentioned that, the offered UPS and/or inverters shall operate and to be in service without any interruption during power lost time.

4.5.3. MDF

4.5.3.1. Required MDF body and ladder must be anti rust and wall mountable.

4.5.3.2. MDF capacity shall be at least equal to number of subscribers plus 25% excess.

4.5.3.3. Required terminals quality shall be confirmed by vendor.

4.5.3.4. Number of vertical terminals on incoming subscribers side shall be equal with total internal line and urban line plus 25% excess.

4.5.3.5. Horizontal terminals on incoming telephone exchange side shall be multiplication of 8

4.5.3.6. Number of horizontal terminals on incoming telephone exchange side shall be equal of Number of subscribers.

4.5.3.7. Maximum subscriber's cables length from telephone exchange back plane connectors to incoming MDF terminals shall be 25 Meter.

4.5.3.8. The bidder shall provide the following equipments:

- All cables including subscriber cables from telephone exchange to MDF, jumping cables, Earth cables, power cables and etc.

- Two clipper of MDF
- All required ducts for earthing and power supply connecting cables up to 30 Meter length (from battery room to switching exchange and also from earth shineh to MDF.)
- Power fuses (with N.O. feature) as many as subscribers plus 25% excess.

5. Test method

Telephone exchange shall be tested in two steps: Factory truth operation test and site telephone exchange operation.

Factory truth operation test shall be based on supplier standard and also to be confirmed by customer, and on site system operation truth test include following parameters operation truth test assessment:

Subscriber lines – trunk lines – digital lines – power supply – subscriber services – operator consoles – duplicated cards

6. Packaging

Packaging shall be according to manufacturer's standard but shall be approved by customers.

7. Documentation

The bidder shall deliver two perfect sets of signed documentation which including clear description of system structure, wiring, installation, test, maintenance, fault diagnostic of telephone exchange in English/Persian, to customer. It should be better that all documentations have issue No. and date.

In addition to, the bidder shall deliver one copy of documentation as electronic form on CD to customer.

8. Installation and Commissioning

8.1. All installation and commissioning up to operation cutover is under contractor obligations.

8.2. The bidder shall install offered MDF through telephone exchange LOM in the target place it is necessary to mention that, MDF installation shall has enough consolidation.

8.3. The bidder shall achieve required installation and cabling of batteries, inverters, power supply, if it is available and their relevant.

8.4. The bidder shall do all power, supply, earthing cabling and also cabling from subscriber's racks up to MDF.

9. Training

9.1. The bidder must offer following training courses for two trainees per exchange.

- Supervisory
- Installation
- Operatory
- Maintenance and repair up to fault diagnosis level.

9.2. The bidder shall receive the buyer confirmation about time duration of each training course as a time schedule in the bid time duration.

9.3. Training place preparation in the one of Iranian cities is under the bidder obligation and by confirmation of buyer.

9.4. The supplier shall prepare and deliver the buyer all training manuals in enough number.

10. Informative Appendix

A – Bidder's assurances

A.1. The bidder shall guarantee telephone exchange for 12 mounts, and Warranty for 10 years for following item:

- software/application
- hardware
- Technical Support

Note: The start of guarantee is after installation and initiation telephone exchange and start of warranty is after guarantee

A.2. The bidder shall recommend required spare part for 5 years and these requirements shall be approved by end user.

A.3. The bidder shall fill the following example table for all specification items (SOC).

Item	State of Compliance	Supplementary Information and Comments
	Fully Compliant ☐ Non Compliant ☐ Partially Complaint ☐	

In the field of "item" of the bidder shall fill number of requirements and in the field of "State of Compliance" one of the following statements should be included:

Fully Compliant: Indicates that the bidder fully satisfies the requirements.

Non Compliant: Indicates that the Bidder cannot meet the requirements.

Partially Compliant: Indicates that the Bidder can only meet some parts of the requirements.

In the "Supplementary Information and Comments" field any relevant additional information should be added.

A detail LOM (without the prices) should be submitted by the Bidders. After finalizing the LOM in technical meeting with NIGC's technical department the LOP with the same format as the LOM plus the signed and stamped LOM should be handed out to the purchasing department as part of the specification response.

A.4. The cost of the following requirement shall be specified by bidder separately in financial offer:

- The cost of all problems related with installation and start up.
- The cost peripheral equipment such as printer , computer , power (batteries, inverters, rectifiers, cabling , etc), operator console , MDF, etc

A.5. If training is required shall be separately quotes and bidder's offer shall be included duration and cost of courses.