Engineering Standard

SAES-T-820 31 December, 2003

Narrow-band Videoconferencing Systems

Saudi Aramco DeskTop Standards

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1 Scope

This standard prescribes mandatory compliance governing the design, procurement, and engineering of narrow-band videoconferencing systems. It also governs the basic videoconferencing elements of audio, video and graphical communications by providing common formats for compatible audiovisual inputs and outputs, and specifying protocols that will allow a videoconferencing entity to utilize the communications links and synchronization of audio and video signals. This standard applies to Multipoint and Point-to-Point videoconferencing sessions over narrow-band communication services.

Commentary Note:

This standard is not applicable to non-narrow-band videoconferencing transport media.

2 Conflicts and Deviations

Any deviations, providing less than the mandatory requirements of this standard require written waiver approval as per Saudi Aramco Engineering Procedure.

3 References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedure

SAEP-302	*Instructions For Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirements*

Saudi Aramco Engineering Standards

SAES-T-018	*Telecommunications - Symbols, Abbreviations & Definitions*
SAES-T-916	*Communications Building Cable*

3.2 Industry Codes and Standards

ITU-T Recommendations

The following ITU-T recommendations and other references contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All recommendations

and other references are subject to revision; all users of this standard are therefore encouraged to investigate the possibility of applying the most recent edition of the recommendations and other references listed below. The lists of the currently valid ITU-T recommendations are:

Series G - Transmission systems and media, digital systems and networks

G.703	*Physical/electrical characteristics of hierarchical digital interfaces*
G.711	Pulse code modulation (PCM) of voice frequencies
G.722	7 kHz audio-coding within 64 Kbit/s
G.723	Dual rate speech coder for multimedia communications transmitting at 5.3 and 6.3 Kbit/s
G.728	Coding of speech at 16 Kbit/s using low-delay code excited linear prediction
G.729	Coding of speech at 8 Kbit/s using conjugate-structure algebraic-code-excited linear-prediction

Series H - Audiovisual and multimedia systems

H.221	*Frame structure for a 64 to 1920 Kbit/s channel in audiovisual teleservices.*
H.230	*Frame-synchronous control and indication signals for audiovisual systems*
H.231	*Multipoint control units for audiovisual systems using digital channels up to 1920 Kbit/s*
H.233	*Confidentiality system for audiovisual services*
H.242	*System for establishing communication between audiovisual terminals using digital channels up to 2 Mbit/s*
H.243	*Procedures for establishing communication between three or more audiovisual terminals using digital channels up to 1920 Kbit/s.*
H.244	*Synchronized aggregation of multiple 64 or 56 Kbit/s channels*
H.261	*Video codec for audiovisual services at p x 64 Kbit/s*

H.262	*Information technology – Generic coding of moving pictures and associated audio information: Video*
H.263	*Video coding for low bit rate communication*
H.320	*Narrow-band visual telephone systems and terminal equipment*

Series T - Terminals for telematic services

T.120	*Data protocols for multimedia conferencing*
T.123	*Network specific data protocol stacks for multimedia conferencing*
T.125	*Multipoint communication service protocol specification*
T.135	*User-to-reservation system transactions within T.120 conferences*

3.3 Definitions, Symbols and Abbreviations

BICSI/TDMM	*Building Industry Consulting Services International, Telecommunications Distribution Methods Manual*
ITU-T	*International Telecommunication Union – Telecommunications Standardization Sector (previously CCITT)*
Narrow-band	*Bit rates ranging from 64 to 1920 Kbit/s*
NEC	*National Electrical Code*
NECS	*National Electrical Safety Code*
CCITT	*The International Telegraph and Telephone Consultative Committee*
CODEX	*Coder decoder*
MCU	*Multipoint Control Unit*
MVIP	*Multivendor Integration Protocol*
MCS	*Multimedia Conference Server*
PCM	*Pulse Code Modulation*

4 Design

The latest recommendations of the International Telecommunication Union - Telecommunications Standardization Sector (ITU-T), as applicable, are hereby recognized as Saudi Aramco Engineering Standard SAES -T- 820, "Narrow-band Videoconferencing Systems".

The ITU-T recommendations, as specified in section 3.2, shall constitute a set of basic specifications for Narrow-band Audiovisual and Multimedia equipment for deployment, interconnection and interworking between audio/visual terminals and network elements.

4.1 This standard shall only address Narrow-band Videoconferencing systems.

4.2 The two basic building blocks of the video system are the Coder and Decoder (Codec) and the Multi-point Control Unit (MCU). The ITU-T, approved recommendations that define a video compression algorithm and transmission mechanism for images at 64 Kbit/s increments up to 2 Mbit/s for the Codec. Videoconferencing Systems shall (as a minimum) support the ITU-T H.261 video codec image format, and optionally ITU-T H.262 and H.263.

4.3 Videoconferencing Systems shall support the ITU-T G.711 audio codec signal format, and optionally ITU-T G.722, G.728, G.731, G.729.

4.4 Gateway network component depends on the network type and it shall support ITU-T H.310, H.320, H.321, H.322 and/or H.324 endpoints.

Commentary Note:

Gateway (GW) is an endpoint on the network that provides for real-time, two-way communications between Terminals on the packet based network and other ITU terminals on a switched circuit network, or to another packet based network.

4.5 The videoconferencing system shall support Point-to-Point and Multipoint configurations. Conferences may be set up between two or more clients without any specialized multipoint control software or hardware. When a Multipoint Control Unit (MCU) is used, a flexible topology for multipoint conferencing shall be supported. Multipoint conference shall be centralized or decentralize.

4.6 The MCUs used in multiple terminals or sessions are required to meet the ITU-T H231; all MCUs must be compatible with all audiovisual terminals.

4.7 The Narrow-band Videoconferencing system shall support audio, video, and control signals.

4.8 Data signal for telematic support is optional and it shall comply with ITU-T T.120-Series recommendations.

Commentary Note:

Audio signals are continuous traffic and required real-time transmission. Voice activation can be introduced; in such a case, the audio signal is not continuous. The video signal is also a continuous traffic; the highest possible bandwidth within the available channel capacity should be allocated to video signal in order to maximize video quality.

4.9 The system may support optional data encryption; encryption shall be according to the ITU-T H.233 recommendations. Switching-on and off the encryption process must be signaled between the end-point equipment, or end-point and MCU.

4.10 The audio/video terminal shall support one or more of the following audio configurations:

- Handset function
- Handsfree function for a small group
- Handsfree function for a large group

4.11 Handset terminal's sensitivity shall meet Table 1.

Table 1- Sensitivity for the handset

	3.1kHz	7kHz
Send Loudness Rating (dB)	8	8
Receive Loudness Rating (dB)	2	7

4.12 Handsfree terminal's sensitivity shall meet Table 2.

Table 2- Sensitivity for the handsfree

	3.1kHz	7kHz
Send Loudness Rating (dB)	13 - F	13 - F
Receive Loudness Rating (dB)	-7 - F	-5 - F
F is a correction factor, which is a function of the recommended user position relative to the reference distance (50 cm).		

4.13 The audio/video conferencing equipment shall intercommunicate, via an internetworking element, with other communication services such as:

- PSTN

- Other non-narrowband videoconferencing systems.

4.14 The Videoconferencing System shall support multiple rates of 64 Kbit/s to 2.048 Mbit/s. The network interface shall support V.35, RS-449, X.21 or switched 64 Kbit/s primary if available. User data interfaces shall support RS-232 control ports. The minimum recommended data rate for video conferencing shall be 384 Kbit/s.

4.15 Videoconferencing terminals are categorized into the following classes:

a) Class 1 – Minimum level of support
b) Class 2 – Class 1 + support of some optional features
c) Class 3 – Class 1 + all optional features.

4.16 The minimum requirement shall be Class 1. Terminal types shall be according to ITU-T H.320 recommendations.

5 Environmental Conditions

Videoconferencing equipment shall operate continuously under the following ambient air temperatures without any degradation of the manufacturer's guaranteed performance:

	Indoor Air Conditioned	Outdoor Sheltered	Outdoor Unsheltered
Maximum	35°C (95°F)	55°C (131°F)	65°C (149°F)
Minimum	10°C (50°F)	0°C (32°F)	0°C (32°F)

6 Installation

The installation of narrow-band videoconferencing systems shall comply with this standard, National Electric Code (NEC), National Electrical Safety Code (NESC) and other referenced and applicable standards and specifications. The manufacturer's instructions shall also be complied with, to avoid the possibility of violating manufacturer's equipment warranty conditions.

7 Certification and Acceptance

The vendor of Videoconferencing products shall certify that the equipment delivered meets ITU-T specifications. If and where applicable, the vendor shall also certify that the equipment shall comply with future enhancements of ITU-T Recommendations through upgrade or replacement.

Revision Summary

31 December, 2003	Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with minor changes to Section 2.