INTERNATIONAL TELECOMMUNICATION UNION

CCITT

F.730

THE INTERNATIONAL
TELEGRAPH AND TELEPHONE
CONSULTATIVE COMMITTEE

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TELEMATIC, DATA TRANSMISSION, ISDN BROADBAND, UNIVERSAL, PERSONAL TELECOMMUNICATIONS AND TELECONFERENCE SERVICES:

OPERATIONS AND QUALITY OF SERVICE

VIDEOCONFERENCE SERVICE – GENERAL

Recommendation F.730

FOREWORD

The CCITT (the International Telegraph and Telephone Consultative Committee) is a permanent organ of the International Telecommunication Union (ITU). CCITT is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The Plenary Assembly of CCITT which meets every four years, establishes the topics for study and approves Recommendations prepared by its Study Groups. The approval of Recommendations by the members of CCITT between Plenary Assemblies is covered by the procedure laid down in CCITT Resolution No. 2 (Melbourne, 1988).

Recommendation F.730 was prepared by Study Group I and was approved under the Resolution No. 2 procedure on the 4th of August 1992.

CCITT NOTES

1) In this Recommendation, the expression "Administration" is used for brevity to indicate both a telecommunication administration and a recognized private operating agency.

2) A list of abbreviations used in this Recommendation can be found in Annex B.

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Recommendation F.730

VIDEOCONFERENCE SERVICE – GENERAL

(1992)

The CCITT,

considering

(a) that the Administrations have introduced or envisaged to introduce the videoconference service at a national level;

(b) that the Administrations have introduced that service at an international level or envisage to do so;

(c) that such a service should meet the increasing needs of business customers as regards communication integrating voice, pictures and data;

(d) that the interconnection of the national videoconference services is provided by international networks in accordance with the relevant technical CCITT Recommendations,

recommends

that the Administrations offer a worldwide videoconference service following the general service description and operational procedures described hereafter.

1 Introduction

The purpose of this Recommendation is to define and describe the general features and attributes of videoconference services regardless of the network environment where the service might be provided. Especially with respect to the increasing importance of all types of videoconference service in the aera of international business telecommunication, it describes the minimum customer- and administrative-procedures to allow a proper interworking of national videoconference services on an international basis.

Conferences by means of audiovisual telecommunication may be performed by using any type of the videoconference services. The decision about the specific service is to be taken by the user and very much depends on needs for the individual communication application. Further conferences by video may also be performed by using the videotelephone teleservice including its supplementary conference facilities when the functionality and the quality of service (especially that of the video- and the audiosignals) fit the needs of the specific application. This may often be the case when only one user at each location connected is taking part in the conference.

This Recommendation does not deal with the specific aspects which may occur when using the videotelephone teleservice for conference applications. it only refers to the interworking/intercommunication of the videoconference services with videotelephony.

2 Definition

The **videoconference service** is an audiovisual conversational teleconference service providing bidirectional real time transfer of voice and moving colour pictures between groups of users in two or more separate locations (see Note 1). The minimum requirement is that, under normal conditions, the picture information transmitted is sufficient for adequate representation of fluid movements of two or more persons in a typical meeting situation displayed in head and shoulders view (see Note 2).

Although the moving picture information is the essential part of the service other types of information, such as high resolution still pictures, text or data may also be exchanged.

Note 1 – Conversational interactivity is an essential feature of the videoconference service (two way communication). Broadcasting of sound and image without the availability of a returnpath is not within the scope of videoconference service.

Note 2 – The smoothness of the movements in the reproduced picture is essentially dependent on the total amount of motion in the transmitted picture, the transfer rate to transmit it and thus, on the ability of the system to process the videoinformation due to the available transmission network.

It is generally considered that in a normal videoconference situation only a small group of participants of the conference in each location will be displayed simultaneously. Considering the necessary perceptibility of specific motions and facial expressions, the simultaneous display of three persons on standard video monitors seems to be sufficient. This figure may also meet the number of participants in many business meetings.

3 Description

3.1 *General description*

The videoconference service provides for interactive real time communication between groups of users in different locations. The service combines a good audio facility with moving colour pictures of the participants of the conference.

The videoconference service is classified into two main categories:

a) Basic videoconference services (VCS);

b) High quality videoconference services.

Following in general the same functional and operational principles, the two categories mainly provide for different quality of service especially with respect to the quality of the received audio and video signals.

The high quality videoconference service provides for video- and audiosignals with the same or very close to the general quality parameters applied for television broadcasting (Recommendations CCIR 601 and others) and thus, in general, is offered via broadband networks.

As distinguished from that the basic videoconference services normally provide for video- and audiosignals with reduced quality. They are normally offered via digital transmission networks with $p \times 64$ kbit/s channels (p ranging from 2 to 30).

The resultant quality namely of the videosignal when using a certain transmission bitrate mainly depends on the coding/decoding for redundancy reduction and may be determined by either lower temporal- or spatial resolution of the moving video image. The basic videoconference services using transmission bitrates $n \times 384$ kbit/s normally provide audiosignals with an analogue bandwidth of 7 kHz. Thus, the subjectively perceived quality of the audio does not differ very much from that offered by high quality videoconference services.

3.2 *Optional facilities*

To enhance and support the basic communication by audio and moving pictures, it may also optionally offer various auxiliary features as requested for business communication. These optional additional features may either be an inherent part of the service offered by the Administration or be a function of the specific videoconference terminals. They include:

– high resolution still picture transmission providing the users with a means of showing/viewing graphic material and/or three dimensional objects;

– splitscreen-techniques;

– encryption facilities to ensure privacy;

– facsimile facility;

– telewriting facilities (e.g. electronic whiteboard or telewriting pads);

– data transmission;

– auxiliary cameras;

– videotape recording/transmission;

– chairman control facility (for multipoint operation);

– requesting the floor-facility;

– speaker identification;

– translation facilities;

– facilities for picture cataloguing data bases;

– facilities for moving or still picture retrieval.

This list is not exhaustive and may be extended due to the needs of specific applications of the videoconference service.

The extent and functionality for interworking of the auxiliary features are for further study.

3.3 *Videoconference connections*

Videoconference connections may be established as follows:

– reserved or semi-permanent;

– on demand;

– permanent.

3.4 *Configurations of videoconference connections*

The configuration of videoconference connections is either:

– point-to-point, or

– multipoint.

Concerning the information transfer of the audio- and video signals in a point-to-point configuration, it is always bidirectional symmetric.

In a multipoint videoconference all terminals are connected to the others on an equal basis insofar via one or more multipoint control units (MCU). The MCUs may be located in the network or part of the respective terminals. The information transfer from the terminals to the MCU(s) is always bidirectional symmetric.

Some MCUs may use splitscreen techniques to allow the continuous and simultaneous perception of the images of all participants at each terminal. The same performance may be achieved by applying multiple video channels. Other MCUs operative procedures use alternating transfer of the video signal from one source to all other terminals where the decision about the source signal is being controlled by a chairman mode or on the basis of the dominant sound level automatically detected by the MCUs.

3.5 *Description of various videoconference services*

Two main categories for videoconference services have been identified:

– basic videoconference service;

– high quality videoconference service.

The general principles of either category of service are described below.

3.5.1 *Basic videoconference services*

These services employ digital networks with transmission bitrates between 128 kbit/s (e.g. two B-channels of the ISDN) and 2.048 Mbit/s (e.g. primary rate PCM-channel). Due to the restricted information transfer rate, the bandwidth especially of the videosignal must be reduced by means of redundancy reduction coding. As a result the temporal and spatial resolution of the moving video images perceived in basic videoconference services are lower than with normal television. Nevertheless, the services allow the simultaneous presentation of at least 2 participants on one screen with a quality adequate to the conference situation. The number of represented persons may be enhanced by using splitscreen-techniques.

The common basic speech quality offered by the basic videoconference services is the same as for telephony (speech coding according to Recommendation G.711). In addition, most of the services offer a speech quality of 7 kHz bandwidth.

The optional continuous or temporary occupation of parts of the transfer rate (in case the whole transfer rate) allow the use of additional facilities to enhance the videoconference communication (e.g. transmitting of high resolution still pictures, facsimile and/or data transmission, telewriting). The application of additional facilities is controllable by the users on the basis of inband signalling procedures defined in the relevant CCITT Recommendations.

Due to the use of current technical standards two types of basic videoconference services exist:

– Basic videoconference service – Recommendation H.100 (services conform to the H.100-Series Recommendations, e.g. H.100, H.110, H.120, H.130, H.140)

– Basic videoconference service – Recommendation H.200 (services conform to the H.200-Series Recommendations, e.g. H.221, H.242, H.261)

3.5.2 *High quality videoconference services*

High quality videoconference services provide end-to-end communication of moving colour pictures with high spatial and temporal resolution equivalent to the video quality of the conventional TV-standards (or better) and of voice/sound equivalent to broadcast quality (that may include stereo transmission). Optionally, they also provide means for the transfer of high resolution graphics, text and data as well as for end-to-end messaging.

The high quality videoconference services could employ either analogue (television) or digital broadband networks (broadband-ISDN).

The detailed description is for further study.

3.6 *Applications related to videoconference services*

The videoconference service can be utilized in a broad range of applications where the human intercommunication depends on the exchange of visual and audible information and where the quality of service for the audio and/or videosignals in other audiovisual services namely the videotelephony service is not sufficient.

The restrictions especially on spatial and temporal resolution of the moving images, make videoconference services using a lower information transfer rate less suitable for certain communication applications.

High quality videoconference services are expected to meet all needs for the subsequently listed examples for applications. Due to the high video quality any kind of moving images and other visual information can be transmitted without any restriction.

Applications for videoconference services:

– for business meetings (conducted or unconducted) possibly including interactive viewing of documents, graphics, still and moving videos, three dimensional objects, etc;

– teleprinting and advertising lay out attunement;

– remote consultations;
– remote support in technical maintenance, medical diagnostics and therapy, etc;
– tele education;
– product presentation or immediate common repair service training;
– panel discussions;
– fashioning or editing of TV-programmes;
– others.

3.7 *Specific terminology*

3.7.1 **conference convenor**

One who summons participants to a meeting and makes all necessary arrangements.

3.7.2 **presenter**

One who controls the visual information being actively discussed in the meeting.

3.7.3 **audience member**

One who participates in a videoconference other than the presenter.

3.7.4 **conference conductor**

One who leads or guides the technical management of the videoconference.

3.7.5 **multipoint control unit**

Equipment for interfacing 3 or more videoconference rooms.

3.7.6 **muting**

Preventing sound and/or image to be transmitted from a terminal equipment.

4 Procedures

4.1 *Provision/withdrawal*

The videoconference service may be provided after prior arrangement with the service provider. As a service provider option the videoconference service can be offered with several subscription options. Those subscription options may be related to the provision of specific additional facilities, connection configurations and other operational aspects and may be restricted to the respective category or case of videoconference service booked by the customer.

The service may be provided either on a regular basis via permanent subscriber access to the videoconference network or on an occasional basis where the subscriber uses public videoconference rooms operated by the service provider.

Withdrawal of the service is made by the service provider upon request by the subscriber or for service provider reasons.

4.2 *Establishment of communication*

4.2.1 *Reservation*

Prebooking/reservation is the normal procedure of call establishment for the videoconference service. Reservations can be made through the videoconferencing booking center of the service provider. In case of reservation certain procedures must be followed up by the subscriber as well as by the Administration to secure the desired communication and the necessary quality of service. An example for customer and administrative procedures is given in Annex A.

4.2.2 *Direct dialling*

Videoconference calls may additionally be established by direct dialling if this facility is offered by the service provider. Depending on the network employed this facility may be restricted, e.g. to certain videoconference service categories or cases, point-to-point connections and/or national videoconference connections. The basic videoconference service, using 2 B-channels of the ISDN, is likely to be offered worldwide point-to-point with the direct dialling facility. Nevertheless, the possibility for pre-booking should be offered in addition.

In case of direct dialling the procedure for invocation and operation as given for the videotelephone service in Recommendation F.720 applies also for the videoconference service.

4.3 *Customer and administrative procedures*

For a proper operational interworking of different videoconference services on an international basis and in order to achieve the necessary quality of service, the service providers have to agree upon a set of minimum rules for customer and administrative procedures. These rules must cover the following areas:

- general booking conditions;
- registration periods;
- booking periods;
- cancellations of bookings;
- extensions of bookings;
- fault cases;
- accounting/billing;
- set of information necessary for the booking (e.g. date, location of terminals, names of users, technical parameters);
- call set-up;
- conference set-up;
- disconnection;
- call termination;
- call prolongation;
- change of conference mode;
- others.

In case several modes of operation of the terminals are available, the choice should be given to the users among these modes. An example for customer and administrative procedures is given in Annex A.

4.4 *Conference management procedures*

4.4.1 *Unconducted mode*

The basic videoconference management procedure performed is the unconducted mode. This mode can be performed by all terminals without any special technical equipment. None of the connected terminals have priority in sending and receiving audio and video signals. This refers primarily to point-to-point connections but may also refer to multipoint connections using splitscreen techniques or automatic switching based on the dominant speech level.

4.4.2 *Conducted mode*

This videoconference management procedure allows to conduct the meeting in a chairman mode. One of the users is appointed to act as the chairman and the transfer of information between the different terminals is controlled via an inband signalling channel between the terminals involved. Thus, this mode allows to rule the videoconference as a normal meeting with procedures like “asking for the floor”, “giving the floor”, etc.

The conducted mode needs special technical terminal equipment for sending and receiving the additional control informations.

4.4.3 *Muting*

Any participant may temporarily prevent his terminal from sending out sound or image. In that case an indication should be given to the other terminals.

Muting of the sound is always advisable when not speaking in a multipoint videoconference connection using automatic detection of the dominant speech level for selection of the image to be transmitted.

5 Network aspects

5.1 *Configurations*

The configuration can be either point-to-point or multipoint. The latter can be further subdivided in:

– multichannel multipoint;

– shared channel multipoint;

– switched multipoint.

5.1.1 *Point-to-point configuration*

Two videoconference rooms are directly connected (without any MCU). Conference management is by bilateral negotiation between the terminals.

5.1.2 *Multichannel multipoint configuration*

Three or more videoconference rooms are connected two by two with video channels; each terminal thus permanently receives the images from every other room and displays them simultaneously on separate screens or on a unique screen using the split-screen technique. The MCU is used for mixing the sound channels and managing the conference. Alternately each room could receive the sound from every other room and either mix them or direct them to separate loudspeakers. Limitation to the number of participants comes from the number of channels available in each location and the number of images that can be displayed simultaneously by the terminal equipment.

5.1.3 *Shared channel multipoint configuration*

This configuration always requires a multipoint control unit. This MCU receives signals from every terminal and combines them to elaborate the signals sent out to each terminal. This may be done by multiplexing them in a higher bitrate channel (e.g. four or five H_0-channels into one H_1-channel). It may also be achieved by applying the split-screen technique to the video signals, adding the sound signals and broadcasting the data-channels if they are present. The MCU also processes the control and indication signals.

5.1.4 *Switched video multipoint configuration*

This configuration requires at least one MCU. This MCU receives signals from every terminal; it selects according to predetermined rules or to specific commands the image sent out to each terminal; it adds for each terminal the sounds from all other terminals; it handles the signalling, commands and indications, forwards them when necessary and returns the appropriate answer; it manages the optional channels and broadcasts the signals received on these channels.

The MCU usually adds the sound signals so that each terminal receives the sounds from all other terminals excluding its own; however, this process may be limited to a few terminals selected by monitoring the sound levels or by commands from the users; this may be necessary to prevent the addition of background noises to reach a disturbing level if the number of participants is large. Alternately, the sound may be switched together with the image.

Several MCUs may be required for some configurations either for technical or for economical reasons. In this case, each terminal is connected to one of the MCUs; the MCUs are interconnected and handle the signals to and from other MCUs as to and from an ordinary terminal.

From the network point of view the connections that have to be established are as follows:

a) point-to-point;

b) several point-to-point connections linking all locations two by two;

c) several point-to-point connections between each location and the MCU, which may be non symmetrical if the network supports this type of connection;

d) several point-to-point connections between each location and the MCU, and possibly between MCUs if several are used.

5.2 *Network capabilities for charging*

This Recommendation does not cover detailed charging principles which are to be defined in another context.

Concerning the network capabilities, it shall be possible to charge for the service on a per call basis, based on the duration of the call, the configuration of the call, possibly the time of the day, the type of videoconference service category and/or case requiring different bearers and on additional facilities offered or supported by the network.

Networks which provide the user with the capability of automatic dialling of the connections should have the capability to adapt to the different charging basis in point-to-point and multipoint configurations when the number of participants being connected changes during the call.

As for a normal telephone call in a point-to-point videoconference call established by direct dialling only one subscriber is charged due to the network capabilities.

6 Terminal aspects

6.1 *General systems requirements*

In order to perform the basic functions necessary for the videoconference service, the terminal equipment must include devices capable of:

– capturing participant's picture(s);

– displaying remote user's picture(s);

– capturing audio;

– reproducing audio;

– video coding;

– audio coding;

– management of network interfaces.

The terminal equipment also includes devices capable of performing the following functions:

– user controls;

– user indications;

– self view;

– testing;

– multipoint (for further study).

6.2 *Videoconference terminal equipment*

The basic videoconference terminal equipment may include only the basic elements listed in § 6.1.

Possible enhancements to the equipment in each location are:

- voice switched or manually switched multiple microphones
- multiple cameras performing some of the following functions:
  - overall view of the room;
  - partial view of the assembly;
  - views of individual participants.

The pictures from these cameras may be switched or combined by the split-screen technique.

- additional dedicated cameras;
- multiple screens, for instance for displaying side by side the different parts of a split-screen picture;
- zooming and/or panning;
- various indications such as identification of the displayed location in a multipoint conference;
- controls for conducting the conference, asking for the floor and others.

This list is not exhaustive and is only given as a set of examples.

As a general rule the number of controls that a user has to operate should be kept to a minimum. Training should not be necessary for using the terminal. Clear and concise instructions should be given, for instance on the screen, especially for the supplementary services with which the user may not be very familiar.

7 Quality of service

7.1 *Picture quality*

Video quality is a measure of the ability of a video transmission system to accurately reproduce moving scenes. Video quality objectives are generally expressed in terms of spatial and temporal resolution and may differ for specific applications. Accordingly, optimization and more accurate definition of the picture quality, especially the motion tolerance, requires further study.

7.1.1 *Basic videoconference service*

As a minimum requirement the maximum spatial resolution of the moving pictures in basic videoconference services must at least be as defined for the quarter common intermediate format (QCIF) for video signals (see Note 1).

Note 1 – A QCIF-video signal provides a spatial resolution of 144 lines with 176 picture elements per line for the luminance and 72 lines with 88 pixel per line for each of the chrominance signals.

Above this minimum requirement basic videoconference services may provide a maximum spatial picture resolution according to the CIF video format (see Note 2).

Note 2 – A CIF-video signal provides a spatial resolution of 288 lines with 352 picture elements per line for the luminance and 144 lines with 176 picture elements for each of the chrominance signals.

The maximum spatial resolution must be achieved in videoconference sequences where no movement occurs and no information bitrate of the coded videosignal is necessary to transmit the frame alteration.

Coding equipment for the basic videoconference services normally optimizes the necessary effective-spatial and temporal resolution of the moving images due to the information transfer rate available and finally due to subjective assessments of the codec makers (not effecting compatibility) (see Note 3).

Note 3 – The urgent need to accomplish both subjective and objective methods to evaluate the quality of compressed motion video images is widely identified.

7.1.2 *High quality videoconference service*

The perceived picture quality must be at least as good as that of high quality domestic television receivers (quality parameters see – among others – CCIR Recommendation 601).

7.2 *Audio quality*

In any modes of operation including interworking and fall-back situations the minimum speech quality in all videoconference services must be at least as good as that of the normal telephony teleservice providing a bandwidth of 3.1 kHz. No significant impairment is allowed with regard to Recommendation G.711, A-law or μ-law.

7.2.1 *Basic videoconference services*

The audio quality of the basic videoconference service is equivalent to that obtainable by processing the audio signal according to Recommendation G.711. As an option a better audio quality based on a bandwidth of 7 kHz and coding in accordance to Recommendation G.722 may be offered in the service.

7.2.2 *High quality videoconference services*

The audio quality for high quality videoconference services is for further study.

It is assumed that it should be at least as good as for broadcasting. Stereophonic transmission at a bandwidth of 15 kHz seems to be most appropriate for the high quality services.

7.3 *Differential delay between audio and the video signals*

With respect to the necessary lip synchronism no subjectively discernible delay between the video and the audio signal must occur.

7.4 *Overall delay*

The overall delay is defined to consist of transmission delay and the characteristic delay of the videoconference terminal for the respective service. Characteristic delay of a videoconference terminal is the delay introduced by the terminal when only lips and eyes of the users are moving.

The overall effect on quality by the delays introduced by video codecs, MCUs and transmission facilities needs to be taken into account in the service because increased delays may impair the user acceptability.

Maximum allowable delay including maximum number of satellite hops are left for further study.

7.5 *Disturbances when switching between videosources or when changing the video channel bitrate*

When switching between two image sources, the codec needs some time to rebuild the new picture. A fast recovery is of course an important factor of quality. Moreover, some commands such as picture freezing, cause a visible and disturbing perturbation. Similarly, too strong reduction in the bitrate allocated to the video may cause a degradation in picture quality.

8 Interworking and intercommunication requirements

8.1 *General*

A videoconference service should be able to intercommunicate with:

- other videoconference services;
- videotelephony services;
- audiographic conference services.

8.2 *Basic videoconference service*

8.2.1 *Intercommunication between basic videoconference services with different bitrates*

The intercommunication is provided through conformance with Recommendations H.221, H.261 and H.242. Functionalities and options will be limited to those of the lower bitrate videoconference service.

8.2.2 *Intercommunication with videotelephony services*

The intercommunication is provided through conformance with Recommendations H.221, H.261 and H.242. This way of intercommunicating will usually degrade the level of quality of the whole videoconference and thus may not be desirable for the users. The other possibility is then that the videoconference would proceed in its normal mode and the videotelephone would intercommunicate with audio only. This could be the users choice.

The second solution is the only one applicable to a B-videotelephone terminal.

8.2.3 *Intercommunication with audiographic conference service*

The intercommunication is always possible at the audio level with 7 kHz bandwidth. The graphic facilities may not be available. In multipoint configurations, there is the possibility that the videoconference would proceed in its normal mode and the audiographic terminal would intercommunicate with audio only.

8.2.4 *Intercommunication with telephony service*

In multipoint configurations it would be desirable to offer the users the possibility to make a telephone terminal join the videoconference.

8.3 *High quality videoconference service*

For further study

ANNEX A

(to Recommendation F.730)

Example for customer and administrative procedures in case of reservation

A.1 *Customer procedure*

A.1.1 *General booking conditions*

A.1.1.1 The network infrastructure employed by the videoconference services makes connections possible between any public or private videoconference terminal worldwide on the basis of a booking system.

The videoconference services are operational 24 hours a day, connections can be provided daily from 0.00 to 24.00 hours, pending previous arrangement.

A.1.1.2 Booking can be made at the International Videoconferencing Booking Centres (IVBC) operated by the respective service provider.

A.1.1.3 IVBCs are opened on the conditions nationally in force (normally during working hours).

A.1.1.4 Booking can be made for:

- point-to-point connections;
- multipoint connections.

A.1.1.5 If videoconference booking centers of different service providers are involved (normally the case in international videoconference connections) it is the responsibility of the users at all sites (videoconference terminals) to contact their respective IVBCs in order to confirm every booking.

A.1.2 *Registration periods*

A.1.2.1 The reservation of network capacities is effected in the order of the booking.

A.1.2.2 A minimum registration period of 3 working days before the beginning of the session normally applies.

The actual booking deadline depends on the country of destination.

The service providers involved will try to meet requests for connections at shorter notice.

A.1.3 *Booking periods*

A.1.3.1 The minimum booking period for international videoconference connections is half an hour[1)].

A.1.3.2 The videoconference connections will be established and terminated at the agreed time which should follow a 15 minutes steps basis[1)].

A.1.4 *Cancellations*

A.1.4.1 If a videoconference is cancelled 3 working days before the scheduled time, no cancellation fees will be charged[1)].

A.1.4.2 Videoconferences cancelled at shorter notice may be charged according to the rules of the service provider.

A.1.4.3 Postponements of a videoconference already booked are treated as a cancellation with subsequent renewed booking.

A.1.5 *Extensions*

A.1.5.1 Any request for an extension will be accepted if there is a sufficient network capacity and terminal(s) availability.

A.1.5.2 Extensions are provided on a 15 minutes steps basis[1)].

A.1.6 *Effect of faults on booking periods*

A.1.6.1 A faulty videoconference connection may be terminated at any time at the request of the subscriber if the duration of the fault exceeds 15 minutes.

A.1.6.2 Fault times for which the service providers involved are responsible, will be compensated with an extension if there is sufficient capacity and if it is according to the wishes of the customer. If not, the fault time, rounded up in periods of 15 minutes, will not be included in the duration charges. In case of a faulty multipoint connection where all terminals but two have to be disconnected and the two customers still connected wish to continue, this connection will further be handled like a point-to-point connection.

A.1.6.3 Fault times for which the customer is responsible will be liable to the charges nationally in force.

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1) For national videoconference connections, this value may differ due to the regulations of the service provider.

A.1.7 *Accounting*

A.1.7.1 In principle, the charges for the national share of international connections will be invoiced separately by the countries involved on the terminals located in their area of responsibility.

A.1.7.2 Billing the customer in one country only for the connection is possible but must be requested individually to one booking center only.

A.2 *Administrative procedures*

A.2.1 *General*

In order to achieve the necessary quality of service especially with respect to availability, timely provision of the connections and proper interworking of the systems involved, the administrative procedures to establish the videoconference call must be internationally equalized. The users are normally not involved in these procedures.

CCITT Recommendations on:

- provision of international links for videoconference;
- procedures in case of multipoint calls;
- procedures in case of faults;
- procedures for accounting between providers of international videoconference service,

are for further study.

A.2.2 *Booking a videoconference session*

The International Videoconference Booking Centre (IVBC) acts as the customer contact point whenever a videoconference booking is required. It is the responsibility of the IVBC to check the availability of the national and international links and, if required, the public room.

Every effort will be made to meet all requests for videoconference bookings.

The IVBC, after ensuring the availability of all the national facilities, will contact the IVBC of the corresponding service provider to exchange the following informations either by telex or by facsimile:

a) date of service;

b) booking time (in UTC – local time of the IVBC originating the message in brackets);

c) name or corporate name of the originating country user and telephone number;

d) originating room location;

e) name or corporate name of the destination country user and telephone number;

f) destination room location;

g) type of international connection (satellite or terrestrial);

h) international gateway;

i) incidental remarks and/or information for billing;

j) make and model of codec;

k) gateway to be used;

l) bandwidth (bitrate).

It is the responsibility of the user to provide his IVBC with the basic data for this set of informations when booking the videoconference (except those concerning the responsibilities of the service (network-)providers.

On receipt of the information from the originating service provider, the IVBC of the receiving country will carry out the necessary national checks and a confirmation message is sent to the originating IVBC if all the facilities are available.

If some facilities are not available, the IVBCs will agree alternative arrangements after discussion with the users in both countries.

A.3 *Call management procedures*

A.3.1 *Call set-up*

The connections are established at the agreed time. It is the responsibility of the users to have their terminals on at the appropriate time.

A.3.2 *Conference set-up*

For further study.

A.3.3 *Disconnect terminals from calls*

Each user may disconnect his terminal at any time. The disconnection must be announced to the IVBC immediately, otherwise the disconnection may not influence the charging for the videoconference service. Charging principles for disconnection of terminals from videoconferences prior to the booked time are subject to regulations of the different service providers.

A.3.4 *Call termination*

A reserved videoconference is terminated at the end of the booked time either automatically by the network or initiated by the service providers. The call termination may be initiated by the convenor of the conference at any time by request communicated to the originating IVBC.

A.3.5 *Call prolongation*

Only the convenor of the booked videoconference can ask for a prolongation of the reserved time. Prolongation may be granted by the originating service provider after negotiations and agreement between all participating IVBCs about network availability. As this procedure needs some time, the request for call prolongation must be announced as early as possible. Service providers may impose deadlines for it.

A.3.6 *Change of conference mode*

For further study

ANNEX B

(to Recommendation F.730)

Alphabetical list of abbreviations used in this Recommendation

IVBC International videoconference booking centre

MCU Multipoint control unit

QCIF Quarter common intermediate format

VCS Videoconference service