

GOOD PRACTICE GUIDE FOR VOICE, VIDEO AND DATA COLLABORATION

The logo for Fundação para a Computação Científica Nacional (FCCN) is displayed in a stylized, bold, yellow font. The letters are interconnected, with the 'F' and 'C' sharing a vertical stroke, and the 'C' and 'N' sharing a vertical stroke. The background of the banner features a blue-toned image of a computer keyboard and a circuit board pattern.

Fundação para a Computação Científica Nacional

TF-VVC . Activity A

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1 Summary

This document was written within the TF-VVC Activity A. It intends to provide a set of best-practice guides relating good audio, video and data collaboration services, as well as to give some overviews and guidelines on videoconference infrastructure.

Most of the information here presented is part of webpages, books and guides available on the Internet. All of this information can be accessed in full through the references.

This document was compiled by Nuno Gonçalves (nuno@fccn.pt), reviewed by Rui Ribeiro (racr@fccn.pt) and by all the TF-VVC members.

2 Videoconference Infrastructure

2.1 Videoconference Rooms

A videoconference room location should be a quiet, convenient and central location. High levels of structural and airborne noise will be a problem so the room needs to be located away from sources of noise such as traffic, lifts, plumbing, workshops, plant rooms, air conditioning ducts, etc. Sounds that are a minor irritation to the ear can become unbearable when picked up by a microphone. Access should be suitable for persons with a physical disability. A ground floor location is normally preferable.

2.2 Videoconference Room Shape and Layout

To reduce undesirable acoustic effects square rooms should be avoided if possible. An oblong or irregular shaped room is a better shape as it does not encourage standing waves (and thus echoes) so much. Rooms with non-parallel opposite walls are good acoustically, but unlikely to be found in practice. The room layout will depend on the number of participants, the available space, and the purpose of the room.

2.3 Video cameras

The most important component of the camera is the image sensor which captures snapshots of the view in regular intervals (25-30 times per second.) This sensor is characterized by the number of pixels or dots that it can distinguish in an image, called the resolution. Typical resolutions are 640x480 pixels for webcams, 720x480 for NTSC cameras and 720x576 for PAL cameras. (The height, or vertical resolution, is listed first; the width, or horizontal resolution, is listed second.) The technology that the sensor is based on is also important. Inexpensive videoconference cameras, usually termed "webcams" come with a CMOS sensor, which gives adequate image quality, but cannot render color and brightness signals very well. This causes colors to appear dull or slightly distorted, and it also makes contrast adjustments difficult. CMOS cameras are also affected a lot by the quality of lighting in the room. Better cameras, at a multiple of the price, incorporate CCD sensors, similar to those used in professional cameras, and can therefore capture a much better image, offering a lot of possibilities for adjustments, to adapt to any room.

Considering the impact of the main camera on the success of a videoconference, it is extremely important to imagine ahead of time how the camera will actually be used (i.e., room setup, number of participants, user temperament, etc.) and then ensure that the selected camera can support those uses.

Cameras should be placed on hard surfaces such like:

- on the floor with tripods
- over tables. Be sure that the tables don't vibrate
- on higher floors/levels (as technical rooms) be sure that walking around won't make vibrations on the camera.

As many other things on videoconferencing, little annoying things tend to be big problems on a long videoconference reducing the experience of the users and reducing the acceptance of the system and technology it self.

2.3.1 PTZ Cameras (Pan and Tilt Zoom)

The introduction of cameras with an integrated pan and tilt unit has had a major impact on small videoconferencing installations. Where systems require cameras with Genlock or special lenses, for example in large lecture theatre installations, separate pan and tilt units are required. Some Important Factors while choosing a PTZ camera:

- In videoconferencing both horizontal movement (pan) and vertical movement (tilt) are very important.
- Ensure that both the pan and tilt movements are smooth and controllable.
- Many remote pan and tilt heads are designed for outdoor industrial surveillance/security, where quiet and smooth operation are not necessary requirements. These are too noisy, and the movement too jerky for conference use.

2.4 Audio

2.4.1 Microphones

Videoconference system microphones should be positioned as far as possible from any noise sources. Two types of noise sources are most common - background and sporadic noises. Low, background noises tend not to be too noticeable to human hearing but can cause a system's automatic noise suppression (ANS) control to drop all similar low-end sounds, including 'clipping' parts of a conversation. Low background noises are commonly found around HVAC air vents, electronic equipment and overhead projector fans; traffic in hallways and fluorescent lighting buzz.

Potential sporadic noises from closing doors, a telephone ringing, a tapping pen, coffee machines or other brief loud noises nearby will trigger your conferencing system's automatic gain control (AGC) to dampen the overall audio level for a period and reduce the overall sound quality of a part of your meeting.

Tabletop boundary microphones should be placed at least half a metre from the nearest person speaking and two metres from the conferencing system itself. Generally, the farthest a boundary microphone should be from a person speaking is three metres. Gooseneck microphones, if required, should be setup so they are directly in front of the person speaking. Avoid using ceiling microphones as they tend to pick up a lot of background noise.



Ceiling Microfone

This type of microphone should only be used on special prepared rooms with good acoustics and isolation from the outside. "Sound tends to go up", it is valid also for noise.

2.4.2 Echo Cancellation Devices

Unless headphones are used to monitor the remote sound then acoustic echo cancellation will be needed to enable good quality, two way communications. The compression of the vision signal in the CODEC takes an appreciable time to execute (200-300 milliseconds). The sound signals must be delayed by the same amount to maintain lip synchronisation. This delay would introduce intolerable echo if ignored, so echo cancellers are used to reduce the echo to an acceptable level. Echo cancellers function by sampling a proportion of the remote site's sound within the local conference room, picked up by the local microphone, and generating a correction signal to minimise any remote sound which would normally return to the remote site as an echo. To enable this, one microphone must be fixed in the conference room in relation to the loudspeaker that is radiating the remote site's sound. This allows the echo canceller to monitor the remote sound in the acoustic setting of the local conference room and align itself to minimise the echo.

2.4.3 Audio Amplifiers

Audio amplifiers enable a main transmission signal to be routed to many destinations without signal degradation. Another big advantage is that the signals are isolated, so that if one output has a fault (e.g. a short circuit) none of the other outputs is affected. Distribution amplifiers are used for both audio and video signals. If the main video output of the conference room is fed into a distribution amplifier then one output can feed the CODEC, another picture monitor, another a video recorder and another a waveform monitor.

2.5 Cabling System and Control Room

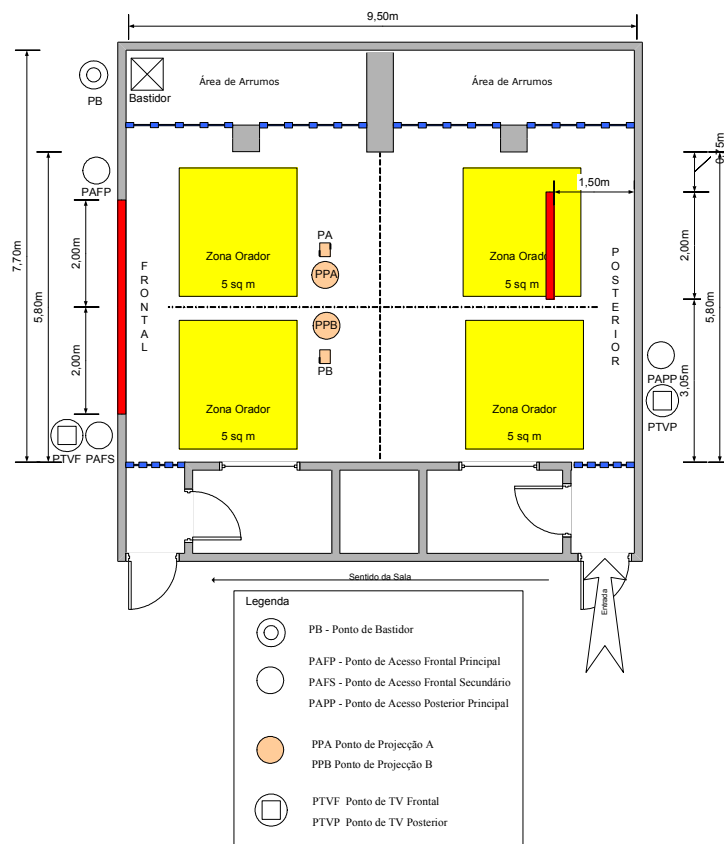
2.5.1 Cabling

Several cables will need to be run from the control desk to the picture monitors and loudspeaker/audio mixer and also to the CODEC wherever these are situated. Some provision must be made for small ducting or conduit to protect these cables.

When cable runs across floor spaces cannot be avoided, then some form of protection must be provided. Special rubber cable protectors are available that protect the cables and minimise the risk of tripping. Where long video cables (100+ metres) are used then much more compensation is required over the frequency band. Some amplifiers will provide this.

2.5.2 Access Points on the Room

Access point's main objective is to provide a fast access to connect several devices to support videoconference activities. Interfaces should be labeled, in order to guide the room support staff to arrange a proper videoconference setup. All access points lead to the several equipments installed in the room through a cabling system. These APs should be strategical planned and placed in the room. The planning should be accurate and detailed. See next picture as an example of room planning.



Next are some examples of access points installed in videoconference rooms:



VGA, SVideo, Composite and XLR interfaces



Composite and SVideo



Table Ethernet Access Point



Table Power and Ethernet Acces

2.5.3 Methods of Remote Control

All professional audio visual equipment and an increasing number of domestic products incorporate remote control facilities. In the case of professional equipment this is normally provided by a serial data connection complying with the RS232 protocol. This not only provides remote control but also reports the status of the equipment back to the control system. Where professional equipment does not support RS232 communications or domestic products utilising infra red (IR) control are used then the control is only one-way i.e. there is no facility to report back equipment status.

Room control systems normally comprise an equipment rack, which contains the main system processor and a number of control cards. The exact number and type of control ports will depend on the complexity of the system but will normally include RS232 ports, Infra Red (IR) ports and relay switch contacts. The control software is custom developed to take into account the particular AV equipment installed as part of the system.

2.6 Projector / Screens

A videoconferencing solution must include the ability to display the remote video that is being received. This incoming video is displayed on a monitor, most often a computer monitor, which influences how clearly the remote site can be seen and also how many people at the receiving site can easily see it. "Typical" display monitor quality considerations such as screen size and resolution affect the size and clarity of the incoming video window and also the integration of the incoming video window with the application interface that surrounds it. The quality of the image within the video window itself is, however, more directly related to the performance and capabilities of the codec and to the quality and bandwidth of the network connection. In the case of a desktop videoconferencing terminal, most offer a scaleable video window that shares space on a PC desktop with other program/application windows. In such cases, the conference aspects most heavily influenced by the capabilities of the computer monitor are the appearance of the video window itself (not what is inside it) and the ability to manipulate that window within the larger display. In some cases, an entire display monitor can be dedicated to displaying incoming video (a "full screen" conference) while a second monitor is added for call control and data sharing.

Note: Video resolutions supported by the popular videoconferencing standards H.323 are CIF (352 X 288 pixels) and QCIF (176 by 144 pixels.) Since these resolutions are fixed, increasing the network bandwidth of a call beyond a certain point will not show an appreciable difference in video quality within any given video frame. However, additional bandwidth enables higher frame rates (i.e., the sending of additional video frames per second), which can have dramatic improvements on the smoothness and video quality of motion.

2.7 Data Projectors

The installation of a data projector and screen in medium to large videoconference suites is becoming the norm. The main criteria for projector selection in the videoconferencing environment are that it should be bright, (better than 2000 ANSI-Lumens) and quiet in operation (less than 45 dBA).

Normal operation of data projection during presentations would require dimming the room lights however it is a requirement for the videoconferencing cameras that the participants are adequately lit. Careful consideration of screen position, lighting, and projector selection can provide high quality projection whilst not impacting on the transmitted images from the videoconferencing cameras.

The introduction into the videoconferencing environment of any unwanted noise will have two distinct effects. If the room microphones pick up the noise then it will be a distraction to the other sites in the conference and may have an impact on effective video switching during a multisite conference. In addition any unwanted noise will act as a mask making it difficult for participants in the room with the projector to hear the audio from other sites.

2.8 Lighting

Room lighting should be adjustable if possible. Depending on the placement of your system and participants, the lighting might need to be adjusted to give the best visibility of everyone and everything on camera.

A combined diffused ceiling and wall lighting arrangement is often best. If you need additional lighting, try using some floor-stand or side-table lamps just out of the camera's view. Indirect lighting will help minimize dark shadows around a room and on people's faces.

2.8.1 Lamp types / Color / Temperature

Avoid mixing fluorescent and incandescent lights from overhead. They operate at different colour temperatures and can produce unusual colouration effects of a room and of people shown on a video monitor. Fluorescent lights are 'cooler' and tend to make people's faces look slightly greenish. Incandescent lighting is 'warmer' making things more reddish-orange in colour.

If your room has curtains or blinds make sure they are kept closed during a videoconference call. This will prevent stray light coming in from outside and interfering with the room lighting and camera settings.

Avoid curtains with patterns or stripes and choose a plain material with a neutral colour such as beige.

2.8.2 Lightning techniques

Make sure that the light is not tinted or shaded by anything in the shooting location. Blinds, lampshades, and even pictures depending on their location can all contribute to an unwanted tint in your shot.

- Ensure that the subject is well lit from the front.
- Change room orientation.
- Remove backlight.
- Remove backlight.
- Change room orientation.
- Light front of subject.

2.8.3 Windows and Natural Light

Windows always cause problems for television cameras due to the changing lighting levels. A room without windows is to be preferred. If windows are inevitable (perhaps in a multi-purpose room) then adequate blackout must be provided to exclude all natural light. Roller or vertical blinds are seldom successful and heavy curtains or drapes are much better. These will also assist in improving the acoustics (and the decor).

2.9 Furniture

Use a table combination that is curved, a half-circle, or is V-shaped if possible. For a small room configuration, you'll want to be able to have between four and six seated participants visible on camera at one time. All tables should have privacy panels under the tables and be moveable - preferably on wheels.

Choose a table with a matte, medium coloured surface if possible to avoid reflection and lighting problems. Keep away from having bright objects on the tabletop such as glass or items with chrome metal finishes.

Chairs with a dark fabric covering are best. Chairs with bright metal finishes can interfere not only with camera lens brightness settings, but also with the camera auto-focusing controls.

A small table situated beside the conferencing system may be useful if you require a document camera, or other peripheral be setup.

There are special tables for videoconferencing rooms. These tables are trapezoidal and are better because all the participants are easily seen by the camera.



<http://www.videonations.com/videoconferencing-tables.php>

2.10 Backgrounds floors and walls

Hard surfaces reflect sound creating 'multi-path' sound reflections in a small room. Carpet the floor and use an insulated fabric material on the walls to reduce any noise and echo in the room. Often, having an acoustic material covering on one wall is enough to eliminate the majority of potential sound echoes. All modern roll-about videoconference systems have built-in echo-cancellation controls for eliminating minor sound reverberations.

Ideally, the room doorway should be behind the camera, or along one of the side walls. This way, no one has to enter or leave the room by walking in front of the camera.

Back wall designs that work best for videoconferencing are those that are covered in plain material with a single colour such as grey or blue. Avoid having a highly reflective whiteboard directly behind everyone on camera. If possible, have a whiteboard positioned along a sidewall, or better, use a portable whiteboard or flip-chart paper stand that can be easily moved and adjusted.

Have your network and telephone line wall plug-ins positioned in the room so lines can easily reach your conferencing system and not create a trip-hazard.

3 Videoconference Good Practices

3.1 Scheduling

While some coordination is required in putting together a successful videoconference, it can be well worth the effort. The experience can be useful and rewarding. Uses for videoconferencing can range from casual, small group meetings all the way up to formal, large, multiple location conferences.

Meeting choices.

Meeting choices for synchronous or real-time communications come down to three basic options - videoconferencing, telephone and web conferencing, or meeting face-to-face. Videoconferencing is considered more suitable than meeting in person for certain applications such as:

- When you want to share information with people in multiple locations,
- When you need to save on time and travel costs,
- When it is more convenient for everyone to meet virtually - i.e. scheduling, weather, physical capabilities, time zone differences.

Reserve a date and time.

Find out from the person handling room reservations if there could be any charges for the use of the space, conferencing equipment or support services, or any potential connection line charges. Come to a decision suitable to both sides for a firm meeting date and time, and then make certain each site's conferencing room is reserved.

If the two sites have not connected before, you will likely need to make sure that each location's videoconferencing technical information is exchanged. The technical contact at each location can provide this information and perform any videoconference test connections required ahead of the meeting date.

Reservations for any catering services or parking permits may also need to be arranged depending on your meeting requirements. Any possible promotion of your videoconference meeting may need to be started at this point as well.

For additional information on how to contact remote sites with videoconference capabilities, please consult these URLs:

Global Videoconference Directory:

<http://www.terena.nl/activities/tf-vvc/F/vc-services.html>

European Videoconference Services Information:

<http://www.terena.nl/activities/tf-vvc/F/vc-services.html>

VideNet Zone Administrators:

<https://videnet.unc.edu/>

3.2 Advertising

To establish interest can be accomplished through telephone calls or e-mail messages back and forth with a contact at the other location. Some initial conversation on potential future meetings dates and times can be discussed.

Ensure that the participants have been reminded of the videoconference. A short e-mail or memo can ensure that the participants of the videoconference will be attending and on time. In your reminder, you could include a link to the participant's checklist, so that they will know what to expect.

3.3 Agenda

If you are working on an extended project or with others, you may want to establish a project timeline. If participating members will be sharing information, they may require time to prepare for the videoconference meeting.

Prior to your videoconference meeting, create a schedule or agenda. Be sure to get input from everyone involved. Your agenda should include:

- Who is acting as the chair and leading the structure of the meeting,
- Who will be responsible as a facilitator at each site for capturing each group's thinking and articulating to the other sites,
- A start and stop time or a time limit,
- Information on what each site is responsible for or presenting,
- Time for asking questions from each site,
- A meeting wrap-up with any follow-up information.

3.4 Testing

The technician has many responsibilities when running a videoconference. Remember that as a technician, you are also a participant in the videoconference, and the same rules of conduct apply to you. Beyond that, there are many other things that a technician needs to pre-plan in order to run a successful videoconference.

- When and where is the videoconference? Make sure that the date and time are confirmed.
- Who is the technician at the remote sites? It is important that the technicians at each site know how to reach each other, in case of problems that may arise during a videoconference. Knowing things such as cell phone or pager numbers, MSN Messenger accounts, e-mail addresses or room phone numbers can greatly reduce problems during a videoconference.
- Have the connection addresses and numbers for each remote site. All sites should know where and how to connect to each site in case of sudden problems. Even if your site is not dialing out, it is a good idea to have the incoming numbers on hand.
- Test the connection. Make sure that the connection has been tested, and that quality has been checked. If there are connection problems, they should be taken care of days before the actual videoconference. Sometimes, there are additional peripherals that are involved in the videoconference, and it is important that these have also all been tested, and are working correctly, both at your site and the remote sites.
- Have presentation material ready. If your videoconference includes a presentation, ensure that the presentation is working correctly. The presentation must be tested and ready to go by the time participants arrive

for the videoconference.

- To make a online test you can use a mirroring system in order to verify your connection.¹

3.5 Dressing codes

On a videoconference one should not use some kind of clothes. In fact there is a dressing code for videoconferencing. The dressing code will make the participant be much more clear and friendly to the remote participants. Videoconference participants shouldn't ever use stripes or the same color or tone as the background.

Stripes

Stripes are very hard on the eyes when in front of a camera. Solid colors or nice prints are much easier to look at from the other end.

Same color or tone as background

If you are standing in front of a dark background, you should be wearing lighter clothing. The same applies to the opposite situation. Wear a darker outfit when in front of a light background. This makes it much easier to be seen.

3.6 Videoconferencing "rules"

The following is a summary list of the best practices learned from the published research project entitled "Instructor And Student Perceptions Of A Videoconference Course" by Trevor Woods, University of Lethbridge:

- Do ensure all the technology is working as expected before offering a course using videoconferencing.
- Do plan time before the start of each class to test the system and troubleshoot any problems.
- Do encourage interruptions if technology is not working properly.
- Do ensure that technical staff is easily and quickly accessible if there is a problem.
- Do use an instant messaging tool so technical staff (if they are used) can communicate behind the scenes and not disrupt the class.
- Do have predetermined strategies in place to identify and deal with problems. For example, if the audio stops transmitting, those at the affected site should interrupt the session by communicating they cannot hear the other location while waving their arms in the air and pointing to ears to indicate that they cannot hear.

¹ One system that may be used is the Copy Bird system. It is available on GDS: 00112971386 or through the following IP address: 152.2.61.199.

- Do insist on microphones on the desk for every student or every second student to produce good sound.
- Do use a fresh set of batteries in wireless microphones each session or track the usage and replace often.
- Do use a wireless lapel microphone for the instructor to ensure consistent high quality sound.
- Do teach participants to speak up when in a videoconference to ensure the remote site can hear what is being said.
- Do have the instructor repeat questions and comments that are made by students to ensure nothing is missed.
- Do teach participants not to talk at the same time as the participants at the opposite location. Try not to interrupt another person talking. If you are interrupted, let the other person talk, or continue talking yourself without a break to prevent confusion of both people not knowing if the other person is pausing or going to continue talking. (Because of the half-second delay in transmission).
- Do reduce student fears of videoconferencing by providing an orientation of the system during the first class where everyone learns and practices using the system.
- Do provide videoconferencing office hours for the remote students, before and/or after each class.
- Do be prepared that less content can be covered in a class discussion when compared to a traditional face-to-face class. Additional out-of-class support materials are beneficial to make up for a reduction in seminar like class time.
- Do ask students to sit in the same location each class to aid the instructor in identifying students.
- Do explain to participants before hand what is going to happen, what they can expect, and what is expected of them.
- Do use a backdrop to improve the quality of the video image.
- Do use cue cards and a thin marker to ensure that the document camera is zoomed to a default state that ensures students can read the text that is written. (Vs. 8 1/2 x 11 sheet of paper with the document camera zoomed out so the entire page is in the view causing the writing to appear too small to read but good enough to be used as a guide if the student has a hard copy in front of them.)
- Do ensure supervisors and/or senior administration show their support of the initiative by:
 - being available to talk about the experience as it occurs;
 - providing action as issues arise;
 - providing incentives such as a teaching assistant to help prepare material and/or participate at the remote site;
 - providing technical support;

- o providing pedagogical support for adjusting the content and teaching approach to this method of delivery.
- Do not build the videoconferencing technology just before or while the system is being used.
- Do not change or upgrade the videoconferencing system or technology while it is being used for a course. Wait until a break when there is sufficient time to test and fix any unexpected problems resulting from the changes.
- Do not use ceiling microphones because of their poor ability to pick up voices.
- Do not alienate the remote site or the local site. Ensure that both are getting equal attention.

3.7 Agenda

Have an agenda. Since the chair conducts the flow of the videoconference, it is important that the chair knows the planned schedule of the meeting.

Making a presentation in a videoconference can be quite exciting. There are many different presentation tools available to use so you can deliver a great presentation. There are some things that everyone in a videoconference needs to be sure to do BEFORE walking into a videoconference, and if you're making a presentation, there are few extra preparations you should make.

3.8 Roll call

At the beginning of the meeting the chair should make a roll call to every site. Each site should respond and present them selves stating their location (city and country) and presenting each of the persons on location. Even that will not participate on the meeting actively. If they are showing them selves to the remote locations, they should be presented. The exceptions are if this is a regular meeting (there are the same persons and locations as the previous meetings) or if there is an auditorium (people on the audience should not present them selves unless they are putting some questions. They should present them selves just before placing the question).

3.9 Muting

The sound is critic on a videoconference. Participants and especially, site coordinators should be aware that every noise on their location will be transmitted to other locations. To avoid MCU video switches or fatigue on remote users due to noises, every site coordinator should mute their microphone while not in use. Every participant should be aware of this and should unmute the microphone just prior to talk muting back when their intervention has finished.

3.10 Microphones

A successful videoconference relies on good quality audio. It is important to be heard in a videoconference. There are some key elements to consider for audio in a videoconference.

Speech

Keep your voice at an even level throughout your delivery into the microphone. Ensure that you pronounce each word carefully and precisely - avoid slurring of words.

Remember to keep the conversation flowing at a natural pace - not a mechanical, monotonous reproduction.

3.11 Using the clock

Videoconference is a time saver. Usually it saves times in travels and in decision making because all the key persons can be face to face and discuss issues easily. However, because it's so easy, people schedule meetings between other (local) meetings and other issues of their work. One (videoconference) meeting should not take more time than it is scheduled. With limited time, a non controlled meeting will give no results. Just as a conventional meeting (without videoconference), it must be very well planned. Before the meeting plan and set the time for each agenda item, look at the clock and follow the time as precise as possible. Be sure to have a clock on the room and be strict about the timetable.

3.12 Getting responses from others

On videoconference, because there are missing communication channels (some body language, parallel talking ...). On a multiconference one site may not be visible at all during some part of the conversation. It's easy for participants just take the passive action (not to participate at all). If feedback from one or a set of participants is needed, the chairman of the meeting should actively do a roll call to every sites and participants in order to get answers and feedback. Asking to the meeting something like "what do you think about it" open in the air will just result in one big silence. On a conventional meeting, people will tend to be more active because of the eye contact and will be "forced" to as things to discussing issues.

3.13 Chair a Videoconference

Chairing a face-to-face meeting effectively requires some skill and attention. Chairing a meeting over videoconference requires even more effort as the participants are not all in the same room and may not be able to see each person at each of the sites all at once. Furthermore, there is often a half second or more delay in a videoconference which can cause confusion when trying to interrupt someone talking or when several sites try and talk at once. The following are some things to consider:

- **Show up early to the videoconference.** The technicians or person responsible for making the connection to the remote site(s) should be connecting early so there is time to troubleshoot problems before the participants arrive and the meeting gets underway.
- Make sure the room arrangement is to your satisfaction.
- Are the microphones in the right spot?
- How are the camera angles - where do you want your participants to sit?
- **Introduce yourself to the technicians running the conference at each site.** Make sure they know who you are and outline your expectations for the meeting.
- **Appoint a facilitator at each remote site.** This person will represent their remote site and deal with any issues that may arise. If the participants that are local to them want to speak, they will let their facilitator know. The facilitator acts as a remote co-chair to make sure there is some order at

their site. As the chair, you should act as the facilitator for your site. Be careful not to show favoritism to your local site participants.

- Facilitators at the local sites should:
 - Be responsible to make sure that their local site is working properly and if it is not to try and get it fixed.
 - Ensure that each person at their site is heard.
 - Ensure that camera presets are made and used when local participants are talking.
 - Ensure that when local participants are not speaking, the camera is zoomed out on the group.
- Follow an predetermined order when asking each site to respond. **The facilitator at each remote site will be the first to respond and if someone at their site has a comment or question, the facilitator will turn the floor over to them. This ensures each site is able to respond. After giving each site a chance to respond, you may wish to open the floor to any site that might have a follow up comment or make another round through the order.**
- Do a microphone check at each site to ensure that microphone placement and incoming and outgoing audio levels at each site are appropriate. **Have the technicians at each site test the microphone levels from each seat to ensure there are no 'dead zones'.**
- Seat quiet talkers close to the microphone(s).
- **When the meeting begins, explain your expectations for how the meeting will be conducted and how the site facilitators will be used.**
 - Describe the order that will be used for the sites to respond in the meeting.
 - Have each participant introduce themselves beginning with the facilitators at each site. This is a good way to double check audio levels before getting into the business of the meeting.
- Ask the remote sites to mute their microphones when they are not in use. **This will ensure that video does not switch to their site if someone coughs or makes a noise. It will also prevent such noises from being broadcast to the other sites and acting as a distraction.**
- Do not allow sites to engage in side conversations that cause low audio (mumbling) to be transmitted to the other sites.
- **Keep the meeting moving and look for participants who appear that they want to make a comment or are growing bored.**
- **End the meeting with a round table following the same order for site comments that you have used. Thank the facilitators and the participants.**
- **Hang up quickly so after meeting chatter is not transmitted.**

3.14 Participating

This technique is good for many medium-sized meetings. Like "just speaking up," it is quite familiar. In this technique, you ask people to raise their hands, and wait to

speak until recognized by the chairperson. Also like "just speaking up," this is quite intuitive, since people are accustomed to doing this in many settings, but explicitly noting that questions will be handled in this way is recommended.

Of course, with this facilitation technique, it is essential that all participants are visible to the facilitator and each other in video streams. You may need to work with operations staff to ensure that this is the case.

This technique is fairly informal, and should work for events of a moderate size. It is often useful when participants need to share a microphone, such as a hand-held wireless microphone being passed around as needed.

3.15 Finishing

There are a few things that you should take care of before you put the videoconference to rest.

- Ensure that all connections are closed. Ending the call will terminate the connection(s).
- Turn off all the monitors. After a videoconference call has ended, make sure that the T.V's, projectors and monitors have all been shut off. It's easy to forget, as sometimes the screens just go black after calls have been terminated.
- Turn off all peripherals. If the videoconference made use of any other devices, ensure that they have been shut down, and properly stored if necessary.
- Follow up your videoconference with an e-mail or phone call. It's a good idea to keep the lines of communication open with the people that you've run videoconferences with. This is a good way of finding out what other people thought of the videoconference experience. It can also provide an opportunity to find out if there is anything that could be improved or changed to suit particular needs for future videoconferences.

3.16 Video cameras

Camera angles and the location of the participants is sometimes an overlooked aspect of the video conference. By placing participants in the best positions and ensuring that they are clearly seen, your next video conference can have a greater feel of face-to-face interaction.

3.17 Materials

3.17.1 Whiteboards / blackboards

Whiteboards or Blackboards should not be used during a videoconference (smartboards are preferable), however if it is a requisite to use them, then it is advisable to setup a good video camera, with the best definition and best zoom possible, in order to capture and transmit all the content with quality. This camera should be hand operated. It will be hard to use PTZ cameras to zoom and frame the right information quickly while the speaker writes it down.

A second camera should also be used, in order to frame the speaker. With video mixer it is possible to change or mix both video sources. There should

be a special care with light reflection. These boards have strong light reflections; therefore the camera position must be carefully chosen to avoid them.

When using white boards it should be used large dark pens / chalks widths to improve perception as you can see in both figures below.



Normal pen width



Large Pen width

3.17.2 Video presenters / Document cameras

A document camera allows all participants of a videoconference to see documents, images, transparencies with exceptional detail. It is a useful tool for anything that hasn't been digitally saved to be viewed.

A document camera is extremely useful in a videoconference, because it can project transparencies, paper, or even objects to each site with ease.

For transparencies:

- When displaying transparent materials make sure glare isn't a problem. Avoid moving the transparency around too much. Any glare may cause excessive light reflection and may temporarily blind some auto camera functions.
- Use pre-built transparency slides rather than writing out notes by hand,
- Work with ambient room lighting unless the visual presenter has a built-in light feature.
- Use a dark colour marker pen rather than a light coloured one for highlighting areas.

Paper presentations:

- Use a landscape mode. Use only two-thirds of a sheet of 8 1/2 x 11 paper leaving the margins free.
- Use a sans-serif typeface (such as "Arial" or "Helvetica"), bold, and at least 14 points. Have the text printed out beforehand and avoid writing items down with a pencil or pen.
- Use graphics that are easy to understand and see; like simple bar graphs and pie charts.
- Avoid frequently zooming in and out.

Objects:

- Document cameras can be used to show small objects such as electronic components, photo slides, or other three-dimensional materials.

- Use a sharp-ended pen as a pointer rather than using your finger.
- Ensure the lighting and focus is correct for raised objects.

3.17.3 Smart boards

Used with a computer, a Smart board can add extra interactivity to a videoconference by allowing a presenter to write over a computer screen image.

The SMART Board must be oriented correctly in order to recognize exactly where you are pressing.

Also, since you're using a projector, you should check that your Board driver is in projected mode to ensure that your SMART Board will behave as expected.

To ensure the Board driver has been correctly configured, click the SMART Board Tools icon in the System Tray, and then click the Control Panel button and make sure **Projected (Mouse Mode)** has been selected.

3.17.4 Other Materials

There are many different types of devices that can be used in a videoconference to create a sharp presentation. Many or all of these technologies are likely available at your site. To ensure that your presentation will work, contact the technician to make sure that the necessary peripherals are available.

A computer is a very useful tool in a videoconference. It can be used to deliver a presentation, Check to make sure that your presentation will work on the computer at your location. In many cases, you can even bring your laptop in and use it instead of the computer provided. Some of the common videoconference applications for the computer are:

- PowerPoint
- Internet Explorer
- Keynote
- VNC (Presentation & Collaboration software)
- Word/ Excel
- QuickTime

Smart Board

Used with a computer, a Smart board can add extra interactivity to a videoconference by allowing a presenter to write over a computer screen image.

Document Camera

A document camera allows all participants of a videoconference to see documents, images, transparencies with exceptional detail. It is a useful tool for anything that hasn't been digitally saved to be viewed.

VCR/DVD Player

Many presentations include videos on videocassette or DVD. These formats play video and sound to remote sites.

- Use short clips whenever possible.
- Cue up each clip in advance. Don't fumble with fast-forward or rewind to find a particular segment during the meeting.
- If you are using a DVD, write down the particular chapter point you want to jump ahead to and then play. If you have multiple video segments to present, consider having the pieces professionally edited by a multimedia technician.

Check to see that both the audio and video outputs are working correctly and will be heard by everyone.

Projector

Projectors are used quite often in meetings, and can be easily implemented in a videoconference.

Extra Camera

Adding another camera to a videoconference can be an advantage in some situations, such as multiple participants in different areas of the room.

Television

Using a television in a videoconference is another peripheral that can easily be added to any videoconference.

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