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Conference Room Environmental Conditions :

Opening salutation:

Welcome to the TANDBERG University prerequisite Conference Room Environmental Conditions lesson. Before commencing you are required to ensure that you have completed the Introduction to the TANDBERG University eLearning Experience Module that is available through this portal.

Learning Objectives

On completion of this lesson, you will be able to demonstrate an understanding of how to optimize the video conferencing experience. You will be able to:

- Understand how room environments impact audio quality
- Understand how echo cancellation works
- Understand how room environments impact video quality
- Understand where peripheral equipment should be positioned



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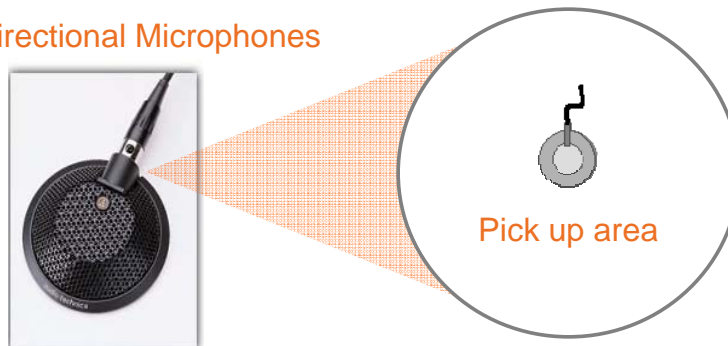
Video conferencing equipment can be placed anywhere as long as they have a network connection of some sort and power. However the picture and audio quality can be improved significantly by making small changes to the room environment.

On completion of this lesson, you will be able to demonstrate an understanding of how to optimize the video conferencing experience. You will be able to:

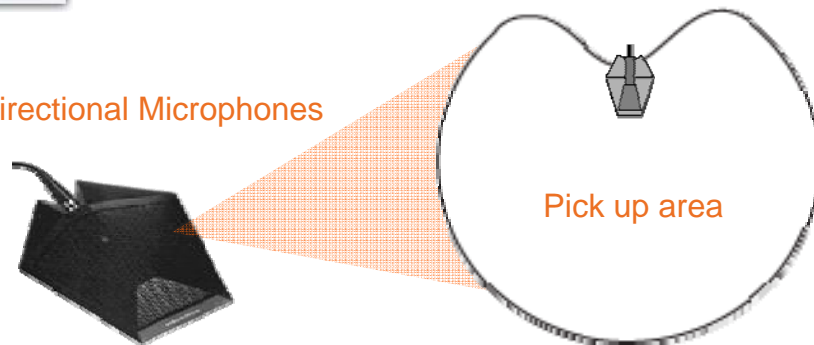
- Understand how room environments impact audio quality
- Understand how echo cancellation works
- Understand how room environments impact video quality
- Understand where peripheral equipment should be positioned

Microphones

Omni-directional Microphones



Uni-directional Microphones



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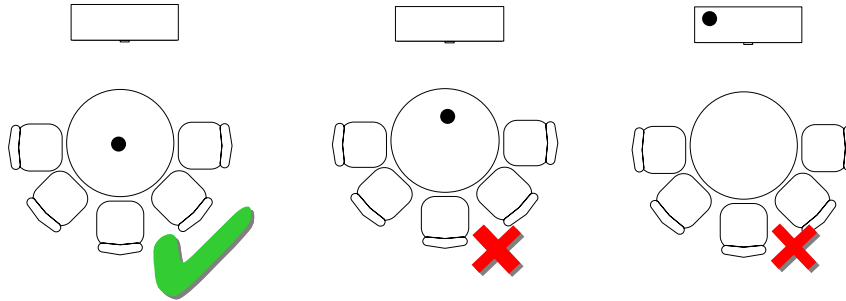
Like any normal meeting, being able to hear what everyone is saying is crucial. Microphones used in video conferencing are designed to pick up sound several meters away from participants and, as a result, are very sensitive. Placing a sheet of paper on a microphone at one end of a video call sounds a bit like a thunderstorm at the other end so it is very important not to cover microphones up with anything. In addition, the video conference system does train the microphone to the room to improve quality. If you move a microphone the system will need to re-train the microphone which can result in poor sound quality for a few seconds. The more you move the microphone the worse the quality gets.

Positioning microphones is also important but does depend on the type of microphone you have. The two main types are unidirectional and omnidirectional. Unidirectional microphones have a 'heart' shaped pick-up area and, as a result, have blank spot behind them.

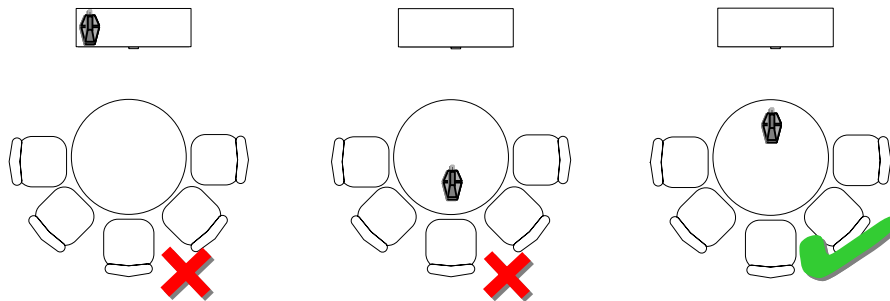
An omnidirectional microphone picks up sound from all around it and as a general rule is circular in shape.

Positioning microphones

Omnidirectional Microphones



Unidirectional Microphones



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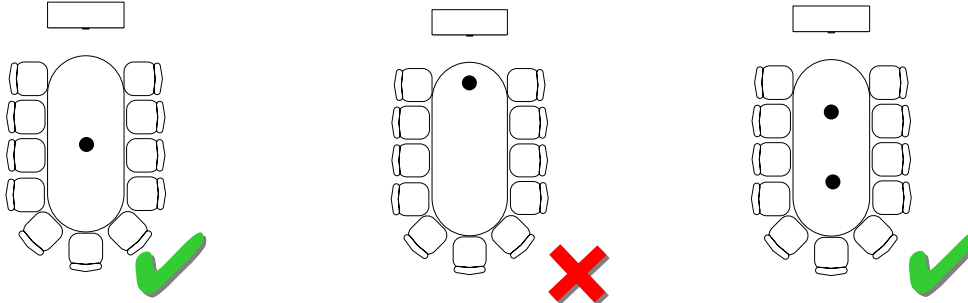
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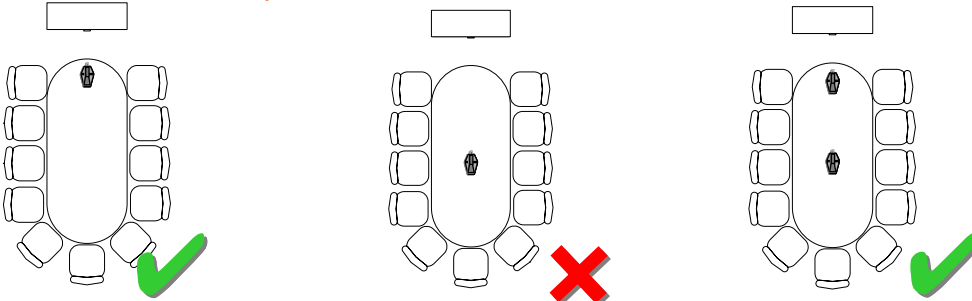
All microphones should always be placed with the cable closest to the system and at least a meter away from the system. Never leave them on top of the monitor or close to the speakers. Omnidirectional microphones should be placed in the middle of the participants whilst unidirectional microphones need to be in front of all the participants.

Positioning microphones

Omnidirectional Microphones



Unidirectional Microphones



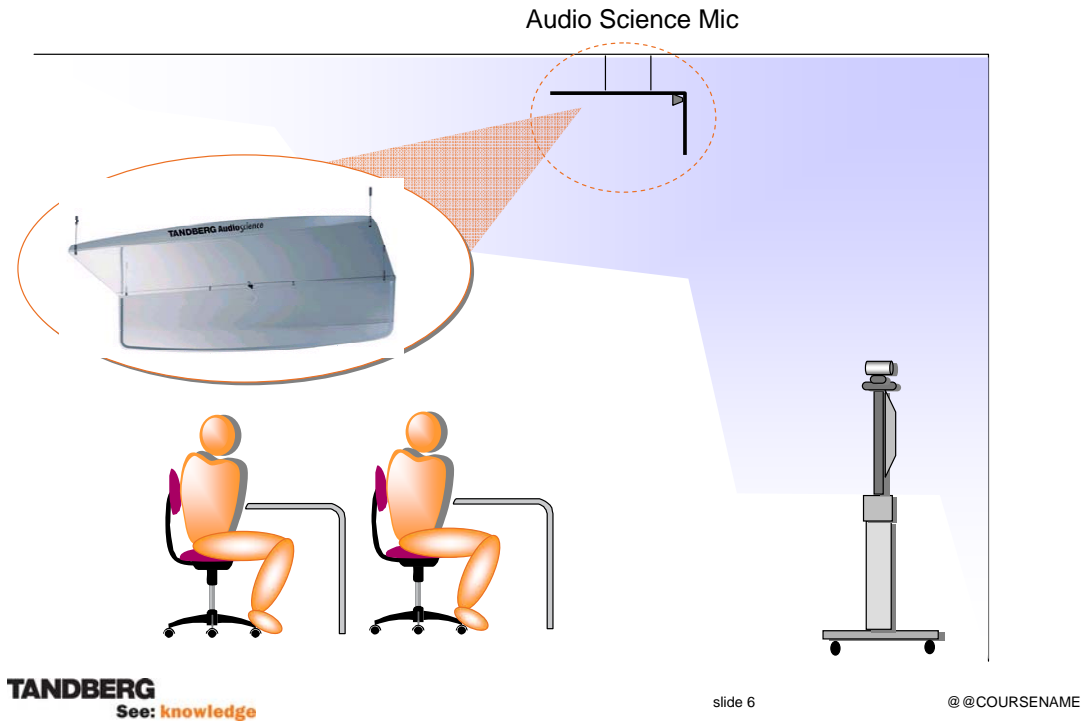
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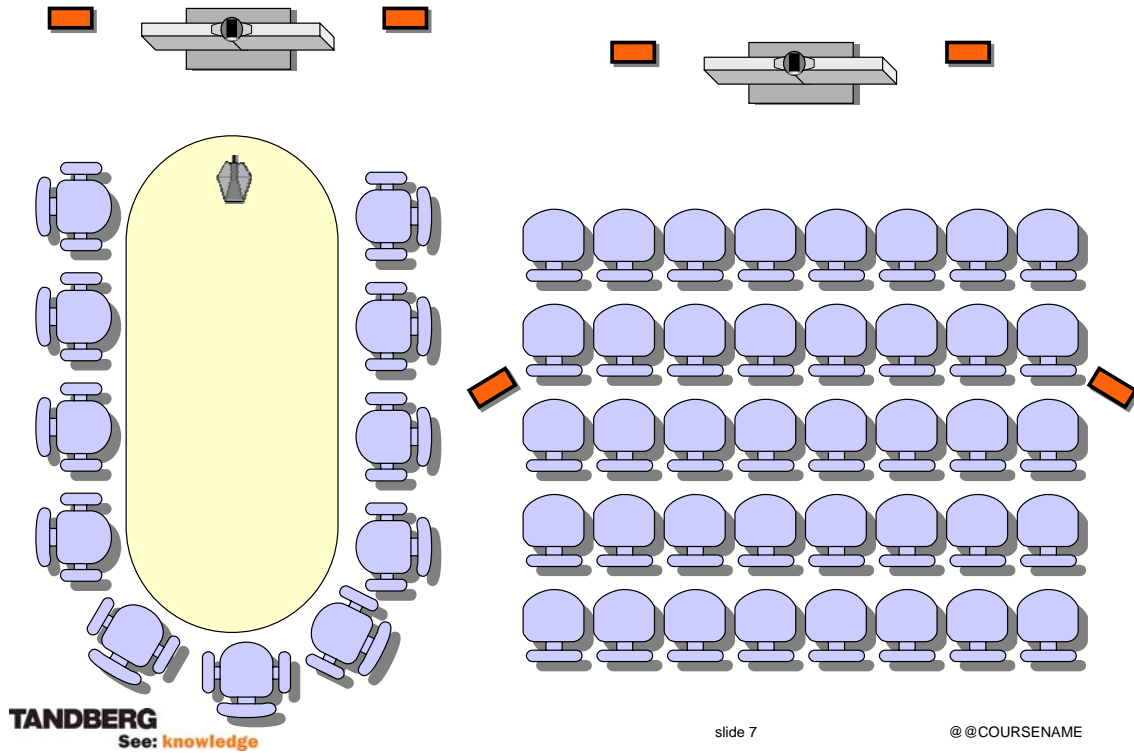
If you have a larger room you can use a second microphone but ensure that they are correctly positioned as shown.

Other microphone options



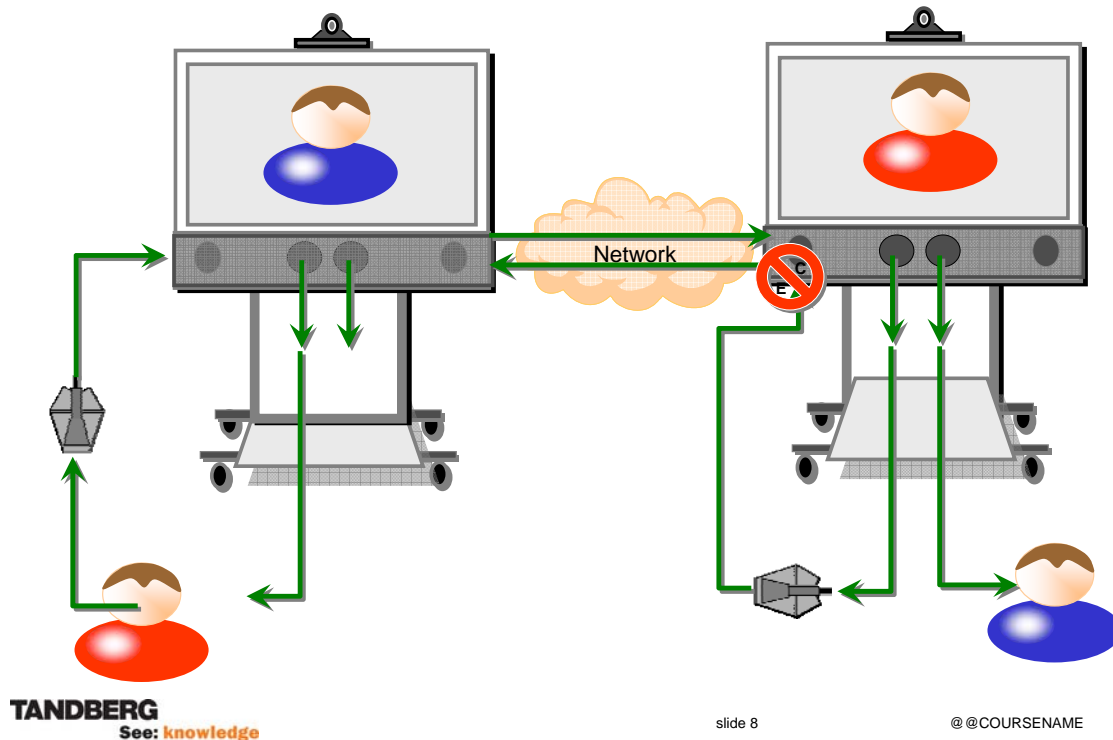
Many customers opt for ceiling mounted microphones such as the TANDBERG Audio Science Microphone. The advantage of these types of microphones is that once mounted in the correct place they will not be moved or covered up by users. When installing ceiling-mounted microphones it is essential that they mounted correctly. The Audio Science Microphone should be mounted as shown with the back panel facing the system and between the users and the system. When installing ceiling mounted microphones of any type it is also important to be aware of ceiling and projector fans that may blow onto a microphone causing excessive noise.

Positioning Speakers



Standalone video conference systems usually have speakers built into them and often use the speakers in the display itself. However you may want to use an external speaker system. Unlike a home cinema system having speakers all around the room does not improve the quality of the audio. In order to feel natural the audio needs to come from the same place as the person speaking. Any speakers should therefore be placed as close to the video picture as possible and be facing in the same direction. The only time additional speakers may have to be used is in a very large auditorium environment where additional forward facing speakers can be mounted further down the room but still facing the rear of the room.

Echo Cancellation



The simplest way to understand what echo cancellation does is to look at what would happen without it. In the diagram above there are two video systems in a call. When the red figure speaks * his audio is picked up by the microphone and * sent to the Codec. The Codec codes up the audio then sends * it to the far end Codec who decodes it and * plays it out of his speakers * in order for the blue figure to hear. However the microphone * in this room also picks it up and without any * echo cancellation treats this sound as * new sound and sends * it back to the originating system creating a loop. Echo cancellation stops this from happening by taking away the sound it sends out from what it receives back.

In most cases echo cancellation works very well and you don't here yourself back. Where echo cancellation fails is when sound that the system sends out comes back to the microphone later than expected. This happens in environments which are very 'live' or 'echoy' where sound is bounced around the room rather than be absorbed. The easiest way to determine if you room is going to cause a problem is to stand in it and clap your hands and listen to the echo created. Most 'live' rooms are larger rooms or have high ceilings, hard flooring or a lot of glass. If you do have an echo problem there are some easy solutions such as putting down carpet and hanging curtains over windows.

(* indicates when to click during narration)

Audio Dos and Don'ts

- Place microphones correctly
- Never cover microphones
- Never whisper anything that you do not want the far end to hear
- Always close the door to avoid noise from outside the room
- Close curtains over windows
- Use the microphone mute when needed
- Always remember that audio may transmit before and after video at the beginning and end of calls – make sure a call is fully disconnected before saying anything you don't want hear

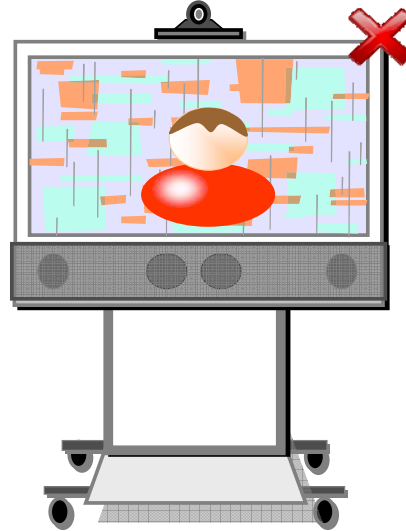
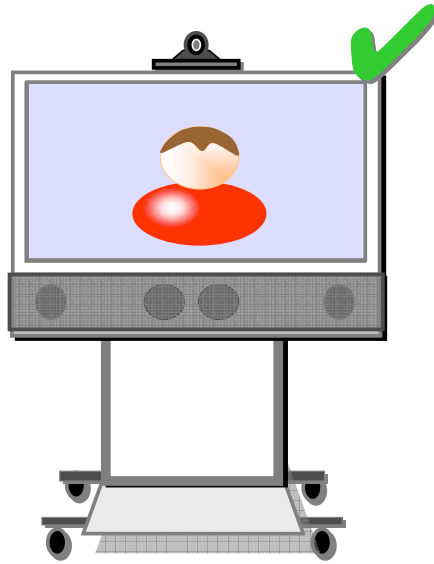


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In summary here are some audio dos and don'ts

Picture Quality



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Before a frame of video is sent to the far end it is compressed. One of the main ways a Codec saves bandwidth is to send only the changes to the far end rather than the whole picture. After the first frame is sent the later frames are of just the changes between it and the original. If a person is seated in front of a plain background in a well-lit room then the amount of changes created when that person moves is much less than if the background was patterned or the lighting was causing a large number of shadows. In addition, by choosing a background color like blue we also get a much clearer definition between the person's facial features than we do with a beige background for instance.

Lighting

Example 1



Lighting is too bright from the window and facial features are lost. Close the blinds!

Example 2



Sunlight through partially open blinds cause stripes on the face

Example 3



Lighting is all from above, causing shadows on the face



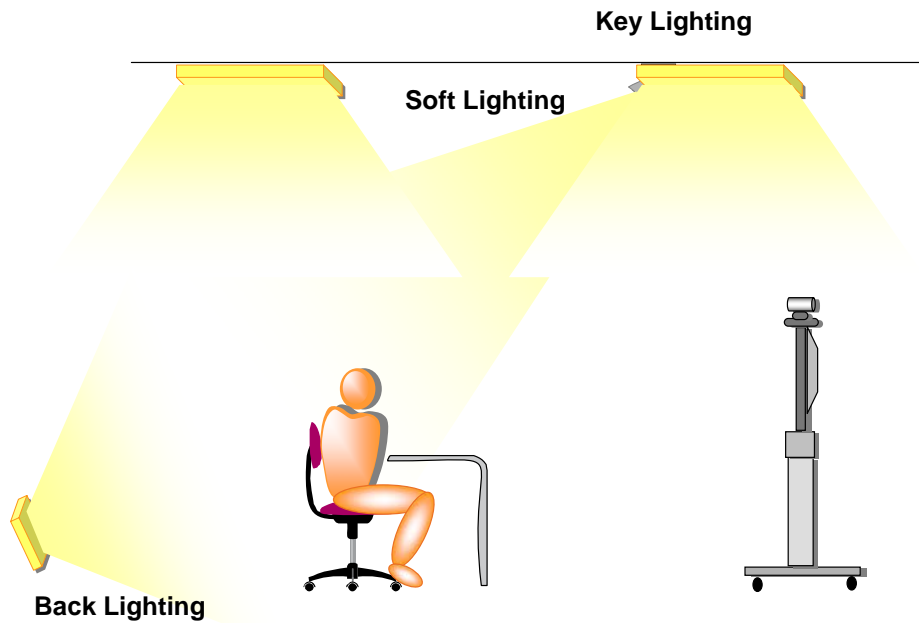
Good lighting is essential for a good picture quality. Lighting should be even and bright. Uneven lighting causes the iris in the camera to try and adjust to different parts of the picture. Example 1 - An common problem is when someone is sitting between the system and a window, often the person becomes just a dark shadow.

Example 2 - Another common problem is the use of spot lighting in meeting rooms which is both too dark and too uneven to provide a good picture.

Example 3 - In this example the lighting is all from above causing shadows on the face.

You can install specialist lighting in video conference rooms which will give you the best solution but this isn't always an option. You can improve the lighting in a room by having light colored, but not bright, walls, (light blue is ideal), covering any windows with curtains and not installing spot lighting.

Optimizing Light Conditions



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Even if you are able to install professional lighting there are still things that you will need to consider to improve the video experience. Were you to install the type of lighting used in TV studios, for instance, your picture would be great but you wouldn't be able to see the screen or the far end. The optimum lighting is achieved as follows:

Key lighting - This is the most important lighting which helps to remove shadows and gives you that extra eye-to-eye contact

Soft lighting - makes key light less dominant and irritating and decreases the contrast in the picture.

Back lighting - will get the person to come out of the picture and feel closer. Always ensure that the source of any backlighting is out of picture shot

Optimizing Light Conditions

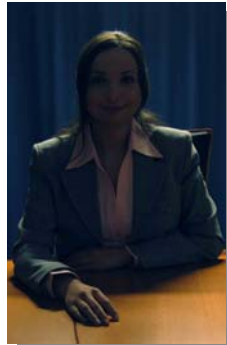
Key light



+ Soft light



+ Back light



= Yes!



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Key light plus soft light plus back light gives a good picture.

Video Dos and Don'ts

- Close the curtains
- Make sure the main lights are turned on
- Avoid busy backgrounds
- Preset camera positions if needed within the call
- Don't cover up cameras
- Keep monitor screens clean – always read the manufactures instructions on cleaning
- Close doors – to avoid any distraction from outside the room



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In summary here are some video dos and don'ts.

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Conference Room Environmental Conditions

Closing salutation:

This concludes the “Conference Room Environmental Conditions” lesson. You are now advised to proceed on to the next pre-requisite lesson that is available as part of your remote learning syllabus accessible through the TANDBERG University portal. Thank you.
