Lighting

Objectives

The objectives identified in the following items, 1 through 16, might not be achieved in every case. For example, multiple tables will place some participants closer than others to the cameras and displays. This situation creates several problems, including light sources within the included angle of view of the participants farthest from the displays and increased difficulty in shielding the displays. One of the best approaches for videoconferencing seating arrangements is the use of fluorescent fixtures with parabolic louvers, which provide adequate shielding as well as some directional control of light due to the typical 45 degree "batwing" light output. Correct placement of the fixtures allows more conventional key, fill and back light opportunities. Modifying factors to these "rules of thumb" are ceiling heights, use of video display monitors rather than projection displays and the use of architectural elements for shielding unwanted light from participants, displays or camera lenses.

1. To provide the proper light level required for the video camera(s), in order to provide a noise-free adequate depth-of-field.

2. To provide properly aimed lighting in order to avoid undesirable facial shadows caused by light sources directly overhead.

3. To minimize the "flatness" of images by intentionally creating shadows and highlights if possible (key light, fill light, back light).

4. To provide proper lighting contrast-ratio acceptable for video cameras. Contrast ratios between subjects and their background should be within a range of 1 ½ - 2 ½ to 1, E.G., 50 foot-candles vertically on participants requires 20-35 foot-candles vertically on background to maintain adequate depth of field.

5. To avoid creating a "TV-studio feel" that is uncomfortable to the participants.

6. To keep light sources in front of the participants and above their included angle of view, yet maintaining a low enough angle to avoid undesirable facial shadows (dark eye sockets, etc.).

7. To prevent the ceiling lights from shining into the cameras, possibly causing the automatic iris to close down, and making the image appear dark (applies to both front and rear of room cameras).

8. To prevent light from falling on the display screens (video monitors), thereby significantly reducing the contrast of the displayed images.

9. To provide acceptable illumination of the background area of the room relative to the illumination of the conference participants (wall-wash, etc.).

10. To provide suitable and consistent color temperature of lighting in order to optimize TV camera performance. All Fixtures are to have tubes rated at 3000-3500K degrees. Do not use warm white or cool white tubes.

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11. To avoid an inadequate lighting plan, which would unnecessarily restrict participant seating or movement within the room.

12. To prevent or minimize unwanted reflections or glare off of the video monitors.

13. To minimize excessive heat generation caused by lighting which would result in user discomfort, or might require additional air conditioning system installation or operational costs (Note: larger air conditioning systems may generate more noise).

14. To properly light secondary areas such as lecterns, writing boards, graphic display areas, or participants and observers not seated at the tables.

15. To prevent or minimize unwanted glare off of writing boards, or graphic stages.

16. To achieve a minimum light level of 50 foot-candles measured vertically at seated eye height.

Considerations:

LIGHTING NOTES:

1. All fixtures are to have tubes rated at 3000-3500 degrees Kelvin. Do not use warm white or cool white tubes.
2. All fixtures to have the same color temperature lamps or tubes.
3. Avoid mixing light sources, if possible, I.E. incandescent and fluorescent, for best results and uniform color rendering.
4. Light intensity to be a minimum of 50 foot- candles, measured in a vertical plane, at eye height (whether seated or standing) measured with the light meter aimed at the camera.
5. VTEL Professional Services typically recommends asymmetrical and symmetrical fluorescent fixtures for videoconferenicng lighting.
6. Vertical foot-candle levels less than a minimum of 50 foot-candles on subjects can cause excessive video noise, loss of depth of field and degrade the quality of the picture produced by the camera. Contrast ratios between subjects and their backgrounds should be within a range of 1.5-2.5 to 1 (50 foot candles on a participant would require 20-35 foot candles on the background to maintain adequate depth of field.
7. All light fixtures to have sound rated magnetic ballasts. The use of electronic ballast may effect any infrared controlled devices.
8. All light fixtures to be supported by structure independent of ceiling grid.
9. Light fixtures can be on separate switches, dimmers or controlled by the system control system for greater room flexibility.
10. Preferred ceiling height 9’-0”.