

Where positive polarity software only is being used on Type 1 screens the luminance limit can be increased to 1500 cd/m<sup>2</sup>.

Where positive polarity software only is being used on Type 2 screens the luminance limit can be increased to 500 cd/m<sup>2</sup>.

The above limits should be applied to the downlighter elevation angle, which impinges on the screen at the relevant luminaire/screen/eye geometry. Typically this will be in the range 55 to 85 degrees.

For uplighting, the maximum average ceiling luminance is 500 cd/m<sup>2</sup> and the maximum point luminance is 1500 cd/m<sup>2</sup>.

#### *Horizontal display screens*

These will reflect large areas of ceiling and it will often be extremely difficult to plan a satisfactory downlighter scheme, which avoids veiling reflections, leaving uniform low luminance uplighting or local lighting as the only viable solutions.

When uplighting it is important that the ceiling and upper walls have matte finishes to provide a diffuse reflection. High reflection factors are essential for high efficiency lighting. Uniform ceiling luminance is the key objective and it is preferable to use more low output uplighters than fewer with a high output. Ceiling ventilation grills or other obstructions should be painted a matching finish to the ceiling to avoid luminance imbalances reflected in screens.

#### *Mimic diagrams*

These need to be evenly illuminated and the level of illuminance will depend on the detail, the viewing distance, and if the display is self-luminous (where overlighting will wash out the luminous detail). Dimming is advisable and asymmetric 'wall washer' luminaires are available which can be surface or recessed mounted.

#### *Room surface luminances*

Surface luminances need to be controlled to ensure no excessive contrasts between the screen and other objects within the same field of view, or other items, which are regularly looked at. In general, light coloured matte finishes are preferable for all room surfaces and furnishings.

#### *Windowed control rooms*

These often provide operatives with an essential view of the processes under control. As with display screen lighting it will be necessary to avoid veiling luminaire reflections in the glass and the same principles will apply. Reflections of room surfaces must also be controlled, especially if the average luminance outside the control room is significantly lower than within. Dimming controls will often be necessary to provide the requisite balances.

#### *Emergency lighting*

This deserves careful consideration in control rooms, since high-risk processes may need to be continued or shut down in the event of an emergency. This may require lighting levels in excess of the normal escape route levels, even up to 100% of the normal lighting levels. In these circumstances it is often necessary to consider uninterruptible power supplies to the lighting rather than self contained battery operated luminaires which only deliver a relatively low light output.