

power, the dimming range will have increased to 100 – 10 per cent. In the example, this would be 500 – 50 lux.

If the switching is to be relatively unnoticeable to the occupants, the proportion of the electric lighting should not be more than 20 per cent of the total task illuminance. The use of dimming to compensate for the maintenance factor does not, therefore, affect the choice of trigger illuminance, which in the above example would be set at not less than 500 lux.

3.8.2 Maintained illuminance

See also Maintenance of lighting installations (see CD).

Maintained illuminance (E_m) is defined as the average illuminance over the reference surface at the time maintenance has to be carried out by replacing lamps and/or cleaning the equipment and room surfaces.

Before the 1994 edition of this *Code*, in the UK the maintenance factor only took account of losses due to dirt collecting on the lamps, luminaires and room surfaces; it did not include lamp lumen maintenance and lamp failure losses. The new definition of maintenance factor is 'the ratio of maintained illuminance to initial illuminance', i.e. taking account of all losses including lamp lumen maintenance (see Part 4, Glossary, for definitions of the various terms involved).

The maintenance factor (MF) is a multiple of factors:

$$MF = LLMF \times LSF \times LMF \times RSMF$$

where LLMF is the lamp lumen maintenance factor; LSF is the lamp survival factor (used only if spot-replacement of lamps is not carried out); LMF is the luminaire maintenance factor; RSMF is the room surface maintenance factor.

Each of these terms is dealt with more fully in the following sections.

3.8.2.1 Lamp lumen maintenance factor and survival factor

(See Lamps in the LIF Lamp guide, and Lamp replacement – see CD.)

Lamp lumen (luminous flux) maintenance factor (LLMF)

The lumen output from all lamp types reduces with time of operation. The rate of fall-off varies for different lamp types, and it is essential to consult manufacturers' data. From such data it is possible to obtain the lamp lumen maintenance factor for a specific number of hours of operation. The lamp lumen maintenance factor is therefore the proportion of the initial light output that is produced after a specified time, and, where the rate of fall-off is regular, may be quoted as a percentage reduction per thousand hours of operation.

Manufacturers' data will normally be based on British Standards test procedures, which specify the ambient temperature in which the lamp will be tested, with a regulated voltage applied to the lamp and, if appropriate, a reference set of control gear. If any of the aspects of the proposed design are unusual, e.g. high ambient temperature, vibration, switching cycle, operating attitude etc., the manufacturer should be made aware of the con-