



COSINE DEVELOPMENTS

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LEADERS IN LIGHTING TECHNOLOGY

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Emergency Lighting Options

This article describes various emergency lighting solutions that satisfy legal requirements

As the old saying goes "there are many different ways to skin a cat". This is particularly true in providing an emergency lighting solution with the vast array of products available in our local market. On the one hand the lighting designer is faced with the financial constraints and specific needs of the client and on the other hand has to provide a solution that satisfies minimum legal requirements. The chosen lighting system must of course satisfy the performance requirements of SABS 1464 part 22 and the safety provisions in SABS 598-1. This usually precludes the use of off-the-shelf D.I.Y. types of dubious eastern origin that may dazzle with fantastic specifications, multiple personalities and, probably most eye-catching of all low price but end up providing the service life equivalent of a pop-up toaster. Besides, it is in everyone's interest to use products with a history of good service backup and support - qualities now demanded by experienced lighting manufacturers after costly and painful lessons still fresh in recent memory. In the past emergency lighting installations were grudgingly provided to appease authorities and were only really required to operate once - during building commissioning. Thereafter nobody cared and so the vast majority of emergency lighting installations have fallen into disrepair. However, that is all about to change.....

The Occupational Health and Safety Act (Act 85 of 1993) stipulates that emergency lighting systems must be kept in good working order and tested at least every three months. This places the onus on the building owner to ensure that the emergency lighting will indeed operate during a power failure - thus system maintainability and support have also become important considerations. As building owners we need not only fear the wrath of our local fire chiefs through non-compliance, a power outage and subsequent injury to one of our staff or clients could prove to be financially onerous through litigation. Also, we should be mindful that the forthcoming soccer World Cup will attract hordes of legally enlightened revellers who may just be unfortunate enough, whilst basking in an inebriated bliss, to experience one of our frequent power outages.

In order to comply with the OHS Act the emergency lighting system generally needs only provide a very low illuminance of 0.3 lux or so called "orientation" lighting *i.e.*, the working staff or public need only enough light for safe egress. A common knee-jerk reaction has been

to install motor-generator sets or UPS systems. However, these systems are usually more expensive than a self contained emergency luminaire based solution and, more importantly, they may not respond to failures of individual lighting circuits.

EMERGENCY ESCAPE LIGHTING

SANS 0114-2 divides Emergency Escape Lighting into three groups: Escape Route Lighting, Open Area Anti-panic Lighting and High-risk Task Area Lighting. Emergency lighting can, in most cases, be unobtrusively integrated into the existing lighting. The three modes of emergency lighting operation are maintained, non-maintained and sustained. Maintained operation requires both a permanent live and a switched live feed to the luminaire. The luminaire can thus be used to provide normal lighting and emergency lighting. Non-maintained operation only requires a permanent live feed to the luminaire. In this case, however, the luminaire can only provide emergency lighting. Sustained operation also only requires a permanent live feed. Here the light will be permanently switched on and during a power outage the luminaire will automatically revert to emergency operation. The emergency escape lighting must, in all cases, be activated within 30 seconds.

ESCAPE ROUTE LIGHTING

SANS 0114-2 describes Escape Route Lighting as: "That part of emergency escape lighting that is provided to ensure that the escape routes can be effectively identified and safely used at all times". The emergency luminaires must therefore be positioned along the escape route to an exit door. The systems suitable for this task include:

- Self contained emergency modules for fluorescent lighting. The modules (emergency control units plus battery packs) can be fitted inside recessed and surface mounted luminaires including CFL bulkhead fittings. Caution is advised against trying to cram emergency gear into tiny bulkhead fittings because the high temperatures will severely degrade battery life.
- Central battery emergency systems. These are the most "maintenance friendly" of all because the batteries are easily accessible. Most batteries have a service life of three years and usually battery replacement is a time consuming and arduous task.
- Self contained emergency modules for halogen spot-lights. Options include gear specifically designed to be passed through the spot-light aperture.
- Self contained self testing emergency modules for fluorescent lighting. These modules have built-in microprocessors that autonomously conduct regular tests in order to ascertain the condition of the batteries, lamp, etc. This feature significantly reduces scheduled functionality check effort.
- Self contained self testing emergency modules for fluorescent lighting with central monitoring facility. These systems usually also have provision for interface to the building management computer.
- Self contained emergency modules for the new range of PLT type compact fluorescent lamps. These lamps require a heating phase to achieve minimum light output and to prevent electrode damage. Electrode damage and hence premature lamp failure may result if the emergency gear is not optimised to ensure proper lamp ignition.
- Self contained emergency modules for fluorescent lighting with infra-red remote control facility. This facility allows for easy functional testing and standby operation.

- Self contained emergency modules for fluorescent lighting with standby features. These types are particularly useful for unmanned substations and telephone exchanges where battery power may be exhausted by the time personnel arrive or during extended power failures when battery power has to be conserved.

OPEN AREA ANTI-PANIC LIGHTING

SANS 0114-2 describes open area anti-panic lighting as: “That part of emergency lighting that is provided in an open area to avoid the panic that can be brought on by darkness and to provide illumination that will enable people to reach an escape route”. These areas include shopping malls, sports stadiums and factories. The same solutions for the escape route lighting may be suitable including:

- Self contained high light output emergency modules for fluorescent lighting. Emergency light outputs of 50% and 100% are available for lamps up to 65W. The higher light output enables higher luminaire mounting height.
- Self contained emergency flood-lights using fluorescent lamps. These offer a very attractive solution because fewer luminaires are required.
- Self contained emergency modules for halogen spot-lights operating at 100% light output in emergency mode with self test and infra-red remote facility. This feature is particularly useful with high mounting height and hence less accessible luminaires.

HIGH RISK TASK AREA LIGHTING

SANS 0114-2 describes high risk task area lighting as: “That part of emergency escape lighting that provides illumination for the safety of people involved in a potentially dangerous process or situation and that enables proper shut-down procedures for ensuring the safety of the operator and other occupants of the premises”. The requirement of 10% of the normal lighting level or 20 lux usually precludes the use of those systems mentioned in Escape Route Lighting. The best solutions would be high output fluorescent based or halogen spot-light types as detailed in Open Area anti-panic Lighting.



Figure 1: Infra-red remote controlled emergency lighting



Figure 2: Flood-light emergency lighting



Figure 3: A halogen lamp emergency luminaire