

# FAIL-SAFE WARNING LIGHTS

## HSE INSTRUCTION ON IRR17 COMPLIANCE.

Veterinary practices need to be aware of the regulatory requirements under IRR17 (which also applied under IRR99) relating to the function of warning lights at any entrance to a controlled area.

HSE state categorically that if ***reasonably practicable*** it should not be possible to make an exposure if a warning light fails.

Relevant ACOP section:

*Ref: IRR17 ACOP Regulation 9 (2) ACOP paragraph 126.*

*Sources of ionising radiation which can give rise to significant exposure in a very short time should be fitted with suitable warning devices which:*

*(a) indicate for a radioactive source whether it is in or out of its shielding (or the exposure shutter is open or closed);*

*(b) indicate for an X-ray generator when the tube is in a state of readiness to emit radiation and, except for diagnostic radiology, give a signal when the useful beam is about to be emitted and a distinguishable signal when the emission is under way unless this is impracticable;*

*(c) for X-ray generators other than those used for diagnostic radiology, are designed to be automatic and fail-safe, ie if the warning device itself fails the exposure will not proceed.*

It has always been assumed that the diagnostic radiology clause exemption applied, so that fail-safe lights were not required. HSE state that the term *diagnostic radiology* does not apply to veterinary practices and is relevant to human medical exposures only.

It is accepted that veterinary use of ionizing radiation certainly may be for diagnosis but the term has no legal standing with regards to IRR17. It is unfortunate that although there has been no change from IRR99, at no time had this been brought to the attention of the veterinary profession. It would perhaps take some legal scrutiny in either IRR99 or IRR17 to identify the distinction.

RpaVet has been of the opinion that the concept of fail-safe lighting was impracticable, principally due to the ethical, duty of care and welfare consequences of a failed procedure. In cases of impracticality the approved alternative is a duplicate red-light system whereby if one light fails then the second light is still illuminated and the warning system has not failed. The non-functional bulb is then replaced immediately. LED bulbs are preferred due to their low failure rate. The dual light system appeared to fulfil any safety concern relating to inappropriate entry into a controlled area as the chance of both lights failing simultaneously or within a short period of time would be remote.

Until recently the impracticality exclusion remained valid due to technical issues with no suitable units being available. There are now a number of warning light systems available and some have been fitted to veterinary practices. HSE now consider such systems ARE reasonably practicable and require these at all controlled area entrances. It should be noted that this also applies to situations where there is a ducted exposure cable which necessitates the operator to be positioned immediately adjacent to the entrance. The human presence is not accepted as sufficient control.

Available fail-safe systems incorporate circuitry within a dual light box with yellow and red components. These have to be installed by a qualified electrician and if the unit fails (and the X-ray set becomes inoperable) the replacement has also to be carried out by an electrician, with an obvious delay in return to function. There are no user accessible parts. There will be a significant cost implication which is exacerbated where multiple lights are required. I have no information as to the likely longevity of the system and failure rate. It may be that these are highly reliable but this may only become apparent once their use is more widespread. There may be systems in the future that are IRR17 compliant with a user replaceable bulb which would be ideal if the X-ray set is out of action solely for the length of time taken to change a bulb.

HSE have repeatedly stated that any animal welfare consideration is of no relevance and the consequence of a failed procedure has no importance. They have made it abundantly clear that the possibility of a very small inappropriate exposure (however unlikely) to a human outweighs any impact on the non-human patient and distress to the owner or staff. They have suggested that in the event of an X-ray machine not being able to function there would be another veterinary practice within 10 minutes to which the animal could be transported.

Practices should seek the advice of a qualified individual as to the feasibility of installing a fail-safe light system. Documentary evidence is required if the installation is deemed impractical for technical reasons. It may not always be possible for machine preparation to initiate the red light (do not enter) component of the fail-safe light. It is the opinion of RpaVet that if the red component illuminates only at the point of exposure this is an unsafe warning as there may be a significant risk of inappropriate entry to the controlled area.

The dual-light warning system (lights wired in parallel) then becomes valid and must be adopted.

There are some obvious exceptions to installation of a fail-safe system:

1. Battery generators (used as either small animal or on-site equine X-ray) which have no mains connection. Warning lights (dual-light LED system) will be manually switched and suitable reminder signage in place.
2. The generator is not in a fixed position (eg hand-held X-ray; equine ambulatory X-ray). It is practical to incorporate a red light with a warning notice. Temporary signs should be placed at any controlled area boundary and should include battery-operated lights for increased visual impact.



3. Due to software issues some fixed generators should not be repeatedly switched on and off during the working day and remain connected to the mains. It is not suitable to have an automatic red warning light permanently illuminated as this serves no useful purpose. The warning lights may have to be manually switched and a rigorous protocol in place to ensure compliance (eg notices at the operator position). Note that a fail-safe yellow/red system may be applicable if the red component can be illuminated on exposure preparation.

4. CT rooms with a door interlock which either locks the door on preparation or terminates the exposure when the door is opened. RpaVet have informed HSE of such systems but there has been no comment.

5. Transportable/mobile generators which may be used in more than one location. This might include fluoroscopy units moved from theatre to theatre, or any unit temporary moved to theatre (eg for intraoperative radiography). HSE have not commented on any such arrangement.

Other exceptions may apply but would have to be addressed on a site by site basis.

## SUMMARY

**Notwithstanding possible exceptions listed above, any practice which is inspected by HSE and has not installed a fail-safe light system at all controlled area entrances (all modalities) will be deemed to have contravened health and safety law. This will be classed as a Material Breach and the practice will be served with a Notification of Contravention.**