☢ A Critical Examination

IRR99 regulation 31(2)

[15] Requires a person who erects or installs an article for use in work with ionising radiation to:

- Where appropriate, undertake a critical examination of the way in which the article was erected or installed;
- Consult an RPA with regard to the nature and extent of the critical examination and its results; and
- Provide the employer with adequate information about proper use, testing and maintenance of the article.

This regulation does apply to the protection of persons undergoing a medical exposure.

[16] A critical examination will be appropriate in cases where there might be radiation protection implications, for either staff or patients, associated with the incorrect installation of the equipment. Examples include the failure of the safety features or warning devices to operate correctly, poor location or inadequate shielding. The requirement applies to:

- Installation of equipment (whether new, second-hand or refurbished);
- Relocation of existing equipment (including relocation within the same premises); and
- In cases following major service or repair work where there may be radiation protection implications, eg following the fitting of: - a replacement x-ray tube or automatic exposure controls (AECs) (including to mobile or portable units); - a klystron on a linear accelerator; or - an ion chamber on a dose calibrator.

[17] The critical examination should include the safety features, warning devices and protection from (unintended) exposure to ionising radiation provided for the protection of the patient. For example, AECs, exposure interlocks, back up timer, light/x-ray beam alignment and shielding from leakage radiation, may come within the scope of the critical examination.

[18] Where equipment components arrive on site ready-assembled, the person undertaking the critical examination on site may wish to request the records of assembly from the factory, and any critical examination associated with them. While mobile equipment that is delivered fully assembled does not formally require a critical examination (if erected in the European Union, it should have been critically examined by the manufacturer), employers are advised to check that the safety features are functioning prior to first clinical use, to demonstrate compliance with the requirements of regulation 32(1).

[19] Portable equipment, e.g. that used for domiciliary radiography, should be tested appropriately and consideration given to the extent and suitability of shielding prior to any exposure taking place. The degree of testing, and what constitutes an acceptable result, should be agreed with the RPA prior to the domiciliary visit. It may be useful to use a written protocol for the purpose.

[20] While the duty to carry out a critical examination rests with the installer, the RPA consulted may be either the RPA appointed by the installer or the employer's own RPA. The employer and the installer should establish at the contract stage who will carry out the critical examination, I.e medical physics staff or the service engineer, and which RPA will take part. The RPA should have the relevant knowledge and experience in order to provide advice in relation to the critical examination. Following a satisfactory outcome to the critical examination, it is in the interests of both parties for the installer to prepare a report, endorsed by the RPA, to confirm that this is the case. It would be prudent to keep this report with the maintenance record of the equipment during its operational life. If the outcome of the critical examination is unsatisfactory, then the failure should be reported to the employer, remedial action taken and the examination repeated. In any event the employer should not bring any equipment into use unless, if appropriate, a critical examination has been satisfactorily completed.

Guidance Note PM77