



SNS COLLEGE OF TECHNOLOGY

(Autonomous Institution)

COIMBATORE-35

DEPARTMENT OF BIOMEDICAL ENGINEERING

19BME308 - Medical Radiation Safety



UNIT II - RADIATION SAFETY IN NUCLEAR MEDICINE AND RADIOTHERAPY

2.3 Molecular Medicine and Radiation Safety Program

Organizing Radiation Protection in a Medical Environment

The concept of a radiation protection program includes a number of measures to reduce the likelihood of adverse effects due to the use of ionizing radiation. A useful publication for the implementation of such a program in the context of radiotherapy is Technical Document (TECDOC) 1040 of the IAEA. A radiation protection program is considering a facility as a whole. Figure 2.1 illustrates the relationships between all parties involved in a radiation safety program. The regulatory authority will issue a license for the use of ionizing radiation for a particular purpose, such as provision of radiotherapy services. The licensee is the person (in a legal sense) who is responsible for radiation safety. This implies that it must be of interest to managers to provide sufficient resources to radiation protection. Within the institution, radiation protection affects many parties, as indicated in the figure. It is important to consider also visitors, contractors, and other outside persons. They are generally harder to inform about radiation hazards, and it will be difficult to provide any meaningful training and monitoring.

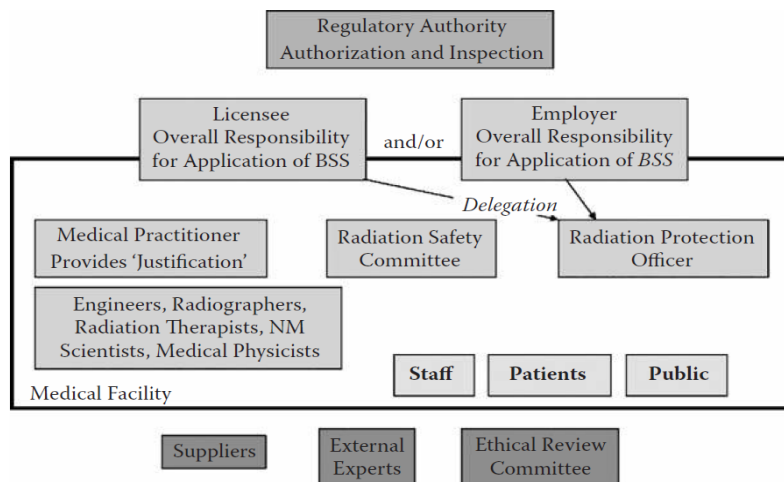


Figure 2.1 Participants in a radiation protection program as discussed in the IAEA Basic Safety Standard



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A Radiation Protection Program

Typical elements of a radiation protection program are the following:

Assignment of responsibilities: The registrant/licensee is the legal person responsible for radiation protection. The general terminology is that a radiation practice of small risk can be registered while a more complex practice with higher risks must be licensed. In practice, though, some responsibilities can be delegated, for example, to the radiation protection officer (RPO).

Radiation protection officer:

The RPO is a person technically competent to provide advice on and oversight of the local radiation safety program. He or she is also often referred to as the responsible person. This person is often (but not necessarily) a physicist. He or she is a crucial component of the program and should be given the resources and authority necessary. The role would typically include responsibility for designation of controlled and supervised areas, responsibility for ensuring preparation of local rules, the training of new staff in safe radiation work practices, liaison with the regulatory authority on radiation protection matters, supervision of the personnel monitoring program, and maintenance of records, especially worker radiation histories. In addition to this, he or she would perform routine surveillance of radiation areas and respond to radiation incidents and accidents.

Radiation safety committee (RSC): Typical roles of the RSC are to oversee the institutional radiation safety program and advise and review local rules relevant for radiation protection. Members may require special training.

Local rules: These are intended to provide adequate levels of protection and safety through the establishment of common work procedures and other systems to be followed by all workers in the area. They should be set down in writing and include all information required for work in the area and be made known to all workers.



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Education and training: All staff in radiation areas must have appropriate education to perform their duties. Staffs who initiate radiation must receive training as well as persons who could be subject to irradiation. Technology is fast developing. It is therefore essential for all staff to have regular updates on radiation protection aspects.

Planning for accidents and emergencies: Planning need to be done in cooperation with other departments and groups. For example, fire and emergency services should have a plan of the facility and be aware of any potential radiation hazards.

System of recording and reporting: In each radiation facility there should be a system instituted where all relevant information relating to radiation work is recorded, documented, and, when necessary, reported to management and the regulatory authority as required. This is a key factor in control of exposures and maintenance of a safe working environment and may depend on national regulations.

Reference: *Jamie V. Trapp, "An Introduction to Radiation Protection in Medicine".*