

Identifying and addressing the support needs in relation to medical and industrial applications of ionizing radiation and lessons learned

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- Development of documents
- Inspections
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- Research and development
- Education and training
- Conclusion

Introduction

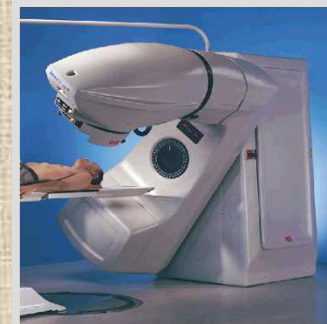
Annual Estimates:

- 3.6 billion diagnostic radiology X-ray examinations (0,03 mSv to 1.91 mSv)
- 32.7 million diagnostic nuclear medicine examinations
- 5.1 million radiotherapy treatments



Workers :

7.4 million, average eff. dose 0.5 mSv



[UNSCEAR 2008]

Introduction

Main Applications:

- industrial radiography,
- industrial irradiators,
- industrial accelerators,
- well logging,
- nuclear gauges (thickness, moisture, density, level and etc...)



Workers :

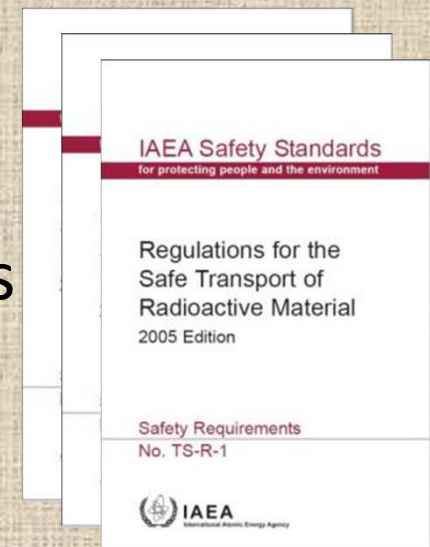
0.9 million, average eff. dose 0.3 mSv.



Development of Documents

“In developing regulations and guides, the regulatory body shall take into consideration comments from interested parties and the feedback of experience. Due account shall also be taken of internationally recognized standards and recommendations, such as IAEA safety standards” [Safety Standards Series No. GS-R-1]

- Regulatory documents
- International standards and recommendations
- Technical documents



Conduction of Inspections

“If the regulatory body is not entirely self-sufficient in all the technical or functional areas necessary to discharge its responsibilities for review and assessment or inspection, it shall seek advice or assistance, as appropriate, from consultants. Whoever may provide such advice or assistance (such as a dedicated support organization, universities or private consultants), arrangements shall be made to ensure that the consultants are effectively independent of the operator.”

[Safety Guide No. GS-G-1.5]

Conduction of Inspections

- TSOs conducting inspections
- Enforcement
- Quality system
 - ISO/IEC 17020:1998: General criteria for the operation of various types of bodies performing inspections
 - ISO/IEC 17025:2001: General Requirements for the Competence of Calibration and Testing
- Training
- Conflict of interest



Emergency Preparedness and Response

The response to those events may require expertise in many areas as:

- Biokinetic modelling
- Bioassay methods for “in vivo” and “in vitro” determination of internal contamination
- Individual external monitoring
- Biodosimetry (cytogenetics)
- Dose reconstruction
- Environmental modelling
- Environmental sample analysis
- Environmental radiological survey

Emergency Preparedness and Response

- Infrastructure
- Training of other organizations
- Conduction of exercises and drills
- Overexposure events
- Assistance to IAEA



Assays, testing and calibration

“In some States, the regulatory body provides some of these services. “When such functions are undertaken, care shall be taken by the regulatory body to ensure that any conflict with its main regulatory functions is avoided and that the prime responsibility of the operator for safety is not diminished” [GS-R-1 para. 3.5]. The managements of the regulatory functions and of the technical support services should be in separate organizational entities.”

[Safety Guide No. GS-G-1.5]

Assays, testing and calibration

- Dosimetry services for the assessment and recording of individual external and internal doses for the types of practice authorized;
- Laboratory services with the capability to provide qualitative and quantitative analyses of radiation measurements;
- Calibration services with traceability to a standard dosimetry laboratory;



[Safety Guide No. GS-G-1.5]

Research and development

The fast development of new concepts for medical diagnostic and treatment with increasing complexity clearly demonstrates the need of the involvement of TSOs in conducting research activities to evaluate the implications to safety and radiological protection, to propose the necessary actions, both to the licensees and to the regulatory body, in order to protect workers, public and patients.



Education and training

“While implementation of a national strategy for building competence in protection and safety should normally be outside the responsibilities of the regulatory body, circumstances may warrant the direct participation of the regulatory body in the training and qualification of the licensees’ personnel in protection and safety. In this case, the participation of the regulatory body in the training and qualification of the licensees’ personnel in protection and safety should be considered a transitional arrangement. The regulatory body should not participate to an extent that could compromise its function as an independent national authority for the control of the use of radiation sources.”

[Safety Series No. RS-G-1.4]

Education and training

- National strategy
- Training to inspectors, reviewers and staff members engaged in regulatory activities
- Extension courses, formal education
- IAEA's Regional Training Centres and PGEC.



Conclusion

It is clear that the support of TSOs is indispensable for the area of medical and industrial applications ionizing radiation taking into account the large number of installations and the fast development of new technologies, especially in the medical area. Its support to regulatory bodies, even if only in some of the areas described here, would strengthen the effectiveness and efficiency of the radiation safety regulatory programme. In the same direction its support to all other stakeholders, as for example in education and training, contributes directly to the enhancement of radiation safety.