

CONTENTS

1.	INTRODUCTION	1
1.1.	Background	1
1.2.	Objective	2
1.3.	Scope	2
2.	PRINCIPAL REQUIREMENTS	2
2.1.	Administrative requirements	2
2.1.1.	Authorization of practices	2
2.2.	Radiation protection requirements	7
2.3.	Managerial requirements	9
2.3.1.	Managerial commitment and policy statement	9
2.3.2.	Organization and responsibilities	10
2.3.3.	Quality assurance	11
2.3.4.	Human factors	12
3.	SAFETY OF X RAY EQUIPMENT AND FACILITIES	14
3.1.	Design of medical equipment using radiation	14
3.2.	Facilities (X ray room design)	17
3.2.1.	Considerations about shielding calculation	18
3.3.	Maintenance	20
3.3.1.	Electrical and mechanical safety	20
4.	OCCUPATIONAL EXPOSURE	21
4.1.	Responsibilities and conditions of service	21
4.2.	Use of dose constraints in radiology	23
4.3.	Pregnant workers	23
4.4.	Classification of areas	24
4.5.	Local rules and supervision	25
4.6.	Protective equipment and tools	26
4.7.	Individual monitoring and exposure assessment	27
4.8.	Monitoring the workplace	30
4.9.	Investigation levels for staff exposure	31
4.10.	Specific issues of occupational protection in interventional procedures using X rays	31

4.11. Health surveillance	33
4.12. Records	33
5. MEDICAL EXPOSURE	34
5.1. Responsibilities	34
5.2. Justification	36
5.3. Optimization for medical exposures in radiology	38
5.3.1. Calibration of patient dosimetry equipment	40
5.3.2. Clinical dosimetry in radiology: Assessment of exposure to the patient	41
5.3.3. Quality assurance for medical exposures in radiology ..	43
5.4. Guidance levels	44
5.5. Dose constraints for research volunteers and comforters of patients.....	46
5.6. Investigation of accidental medical exposure in radiology	47
5.7. Records	48
5.8. Gradual transition from basic to advanced stages of BSS implementation with regard to medical exposure	48
6. PUBLIC EXPOSURE	50
6.1. Responsibilities	50
6.2. Controlled access of visitors	50
6.3. Monitoring of public exposure	50
APPENDIX I: ITEMS FOR A RADIATION PROTECTION AND SAFETY PROGRAMME IN DIAGNOSTIC RADIOLOGY AND INTERVENTIONAL PROCEDURES USING X RAYS	52
APPENDIX II: TRAINING OUTLINE	58
APPENDIX III: GENERAL RADIATION PROTECTION FEATURES FOR RADIOLOGICAL EQUIPMENT	61
APPENDIX IV: EXAMPLES OF RULES FOR OPERATIONAL SAFETY (LOCAL RULES)	64
APPENDIX V: PROTECTIVE CLOTHING	68

APPENDIX VI: OPTIMIZATION BY APPLYING METHODS FOR REDUCTION OF PATIENT EXPOSURE WITHOUT LOSING DIAGNOSTIC INFORMATION	71
APPENDIX VII: GUIDANCE LEVELS OF RADIOLOGY (TYPICAL ADULT PATIENTS).....	80
REFERENCES	83
DEFINITIONS	87
CONTRIBUTORS TO DRAFTING AND REVIEW	95