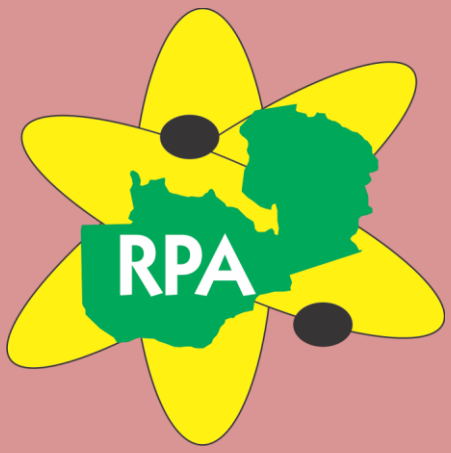
Radiation Protection Authority



Zambia

SAFETY GUIDE

RPA SG 2

Inspection

2015

NOTICE OF APPROVAL

The Radiation Protection Authority Board (RPAB), has on the (day/month/2015), approved the safety guide on Inspection. This guide is approved for the purposes of providing practical guidance with respect to the Ionising Radiation Protection Act, No. 16 of 2005.

Dr. Esther Munalula Nkandu	Mr. Boster Dearson Siwila
….....	….....
CHAIRPERSON	EXECUTIVE DIRECTOR
Radiation Protection Authority Board	Radiation Protection Authority

FOREWORD

Over the last 50 years, the use of Ionising Radiation in Zambia has significantly increased. Institutions using Ionising Radiation include those in Health, Manufacturing, Mining, Agriculture, Research and Training sectors.

The increase in the use can be attributed to the many benefits that are derived from the use of ionising radiation by modern technology. As more sectors begin to appreciate its benefits, there is need to come up with a regulatory mechanism in order to protect the general public, the workers and the environment from the use of the technology as it can be detrimental.

In 2005, the Zambian Government enacted the Ionising Radiation Protection Act to provide for the protection of the public, workers and the environment from the harmful effects arising from the use of devices or materials that produce ionising radiation. The Ionising Radiation Protection Act allowed for the establishment of the Radiation Protection Authority to spearhead the implementation of provisions of the Act. To fully implement the Act the Zambian Government has priotised strengthening national regulatory capacity.

Strengthening national regulatory capacity includes among other equally important elements, the development and implementation of Safety Guides for Practices using ionizing radiation.

This safety guide is primarily intended for use by the Radiation Protection Authority in order to plan and conduct different types of inspections of the various practices that use ionising radiation in Zambia thereby ensuring safe and consistent application of the technology for the benefit of all parties.

It is my sincere hope that this guide will be a good basis for attaining sustainable radiation protection of the public, workers and the environment and compliance by Licensees with the provisions of the Law.

Hon Dr. Joseph Kasonde, MP

MINISTER OF HEALTH

LIST OF ACRONYMS

IAEA	International Atomic Energy Agency
RPA	Radiation Protection Authority
IEC	Inter Electro-technical Commission
ISO	International Organization for Standardization
TECDOC	Technical Document
TECHCOM	Technical Committee of the Radiation Protection Authority Board

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 General

1.1.1 The use of Ionising radiation in Zambia has increased due to the continuing developments in medicine, industry, agriculture, research and education. This safety Guide has been developed to assist the Radiation Protection Authority (RPA) to perform systematic inspections of Practices that use ionising radiation to ensure compliance with the Act.

1.1.2 This guide outlines procedures the RPA will follow when inspecting Practices that use ionizing radiation. The Practices to be inspected may apply to:

1.1.2.1 Mining;

1.1.2.2 Medicine;

1.1.2.3 Industrial radiography;

1.1.2.4 Manufacturing;

1.1.2.5 Research and Teaching;

1.1.2.6 Construction;

1.1.2.7 Food Processing;

1.1.2.8 Well logging; and 1.1.2.9 Security.

1.2 Objective

The objective of this guide is to provide standardised procedures for inspection by RPA, of Practices that use ionising radiation in Zambia.

2.0 RESPONSIBILITIES

2.1 In order to regulate the use of ionizing radiation, RPA will carry out inspections of all Practices that use ionising radiation.

2.2 The Licensee is responsible for:

2.2.1 establishing appropriate Quality Assurance (QA) and Quality Control (QC) measures at the Practice;

2.2.2 making available to the RPA inspectors, all the materials that the RPA may wish to inspect including stand-alone radioactive sources;

2.2.3 compliance with other National and International standards.

2.2.4 compliance with local ethical requirements.

3.0 ACCESS TO A FACILITY

The Licensee or anyone using/ in possession of sources of ionizing radiation shall not obstruct the RPA inspectors access to their premises for the purpose of carrying out inspections.

4.0 INSPECTIONS BY RPA

4.1 Inspections may be for the purposes of:

4.1.1 verifying the suitability of an applicant's facility for carrying out activities involving the use of ionising radiation or radioactive materials (pre-authorisation);

4.1.2 routine checks of a facility;

4.1.3 investigation of an incident/accident; and

4.1.4 termination of a Practice licence.

4.2 The inspections shall be carried out by the RPA or by qualified persons appointed by the RPA.

4.3 Classifications of RPA Inspections

4.3.1 The RPA may conduct inspections under the following categories:

4.3.1.1. planned i.e. pre-arranged inspection;

4.3.1.2 unplanned (adhoc) i.e inspections conducted without prior notice to the Practice ;

4.3.1.3 Interventional inspections (arising from incident/ accident);

4.3.1.4 upon request by a Practice. A Practice may request the RPA for an inspection for the purpose of:

A. fulfilling the requirements of an application; and

B. verification of compliance with the requirements of the Act.

4.4 RPA Inspection team

4.4.1 The team leader of the RPA inspection team shall be a qualified

Radiation Safety Officer.

4.4.2 The members of the RPA inspection team shall be qualified RPA employees or persons appointed by the RPA.

4.5. Inspection Planning

4.5.1 Inspections shall be scheduled on the basis of the status and importance of the activity/situation;

4.5.2 The inspection and follow-up actions shall be carried out in accordance with documented procedures; and

4.5.3 All inspection plans shall be subjected to the approval of the RPA.

4.6 Execution of an Inspection by RPA

4.6.1 The leader of the inspection team shall prepare the inspection plan.

4.6.2 For prearranged inspections, the Licensee shall be informed of the purpose and date of inspection at least one week before inspection.

4.6.3 For unplanned (adhoc) inspections, the Licensee shall not be given any prior notification.

4.6.4 For inspections requested by the Licensee, the day for the inspection shall be agreed between the Licensee and RPA.

4.6.5 The subject, objective and organization of the inspection shall be discussed with the Licensee during an Initial Inspection Meeting.

4.6.6 There shall be an inspection exit briefing.

4.6.7 During the exit briefing, the findings will be discussed with the Licensee.

4.6.8 Following the inspection, the RPA shall produce a report indicating whether the Licensee is:

4.6.8.1 compliant with the safety standards; and

4.6.8.2 non-compliant.

4.6.9 Where the facility is non-compliant, the RPA may:

4.6.9.2 require the Practice to take corrective action(s);

4.6.9.2 revoke the Licence, or

4.6.9.3 reject an application

4.6.10 Where corrective action is required, the Practice shall submit a list of the corrective actions to be taken to the RPA for approval.

4.6.11 The RPA shall monitor the implementation of the corrective actions.

5.0 RADIATION SAFETY AUDITS

The Licensee shall avail, to the RPA inspection team, comprehensive internal and external audit reports.

6.0 RECORDS

6.1 The RPA shall keep records of its inspections.

6.2 All records shall be maintained for the statutory 30 year archival period.

7.0 RPA MANAGEMENT REVIEW OF INSPECTION SYSTEMS

7.1 The inspection system adopted to satisfy the requirements of this Guide shall be reviewed at appropriate intervals by the RPA management to ensure its continued suitably and effectiveness.

7.2 Records of such reviews shall be maintained for 30 year archival period stipulated in the Ionizing Radiation General Regulation.

7.3 Management review shall include assessment of the results of the RPA internal inspections.

DEFINTIONS

Licence:

A legal document issued by the regulatory body granting authorization to perform specified activities relating to a facility or activity

Licensee:

The holder of a current *licence*.

Practice:

Any human activity that introduces additional sources of exposure or additional exposure pathways, or modifies the network of exposure pathways from existing sources, so as to increase the exposure or the likelihood of exposure of people or the number of people of people exposed.

ANNEXES: CHECKLISTS

APPENDIX 2A

INSPECTION FORMS FOR DIAGNOSTIC RADIOLOGY

FORM SG 2A- DR-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION OF RADIATION SOURCES IN DIAGNOSTIC RADIOLOGY

INSPECTION RECORD SUMMARY

Inspection number	
Authorization number	

Name of the facility	
Address (location of the facility)	
Telephone Number	
Name of Radiation Protection Officer	
Name of Medical (or Hospital) Physicist	
Operator's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit time:**

Type of Inspection Pre-authorization Routine	☐ ☐
Investigational Termination	☐
Summary of Findings and Actions NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	 ☐ ☐ ☐
Recommended Date of NEXT Inspection	_____/_____/_____
RPA Inspector name & signature Date	
Licensee name and signature Date	

FORM SG 2A-DR-2

RADIATION PROTECTION AUTHORITY

INSPECTION OF RADIATION SOURCES IN GENERAL DIAGNOSTIC RADIOLOGY

DETAILED INSPECTION RECORD

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each Practice. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not relevant*** *during the inspection a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.*

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, those demonstrations should be described. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate the inspector's findings. Copies of all relevant documents and records required to support item(s) of non-compliance should be attached to the report..

This inspection record/checklist is divided into THREE parts*. The first part deals with matters common to dental and medical radiology. The second with matters more relevant to dental practices (intraoral, panoramic and cephalometric radiology) and the third with medical radiology. i.e. radiology practices, hospitals, GP practices, etc. Medical radiology practices may also possess dental X ray equipment. The officer should use the* ***common*** *first part plus either the* ***second or third*** *part as applicable to the Practice.*

1. AMENDMENTS AND PROGRAM CHANGES

inspection, list for review any amendments submitted by the Practice and approved by the RPA since ection

2. INSPECTION AND ENFORCEMENT HISTORY

Prior to the inspection, list for review any items of non-compliance identified during most recent 2-3 inspections

DATE	INSPECTOR	VIOLATIONS

3. INCIDENT / EVENT HISTORY *Prior to the inspection, list for review any incidents or events reported by the Practice to the RPA since the last inspection*

4. ORGANIZATION AND SCOPE OF THE PRACTICE *Briefly describe the present scope of activities, including types of procedures, frequency of use, staff size, etc. (Note deviations from the licence or registration)*

5. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities; and emergency response

	Yes	**No**
All personnel using or responsible for the use of the X ray equipment have prescribed qualifications and/or training?		
All occupationally exposed personnel are provided with initial safety training?		

Refresher radiation safety training is provided periodically?		
Appropriate supervision of personnel (e.g. technologists, nurses, etc.) is provided by designated practitioners?		
Training records maintained for each worker?		
Interviews with personnel demonstrate an adequate level of understanding regarding safe working procedures?		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments:		

6. INTERNAL AUDITS AND REVIEWS

	Yes	**No**
Operator reviews the radiation protection program at appropriate intervals?		
Audits of the facilities, X ray equipment inventory and working rules performed at appropriate intervals?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

7. AREA RADIATION SURVEYS

Radiological surveys

	Yes	**No**
Operator possesses appropriate, functioning survey instrument(s)?		
Suitable function checks are performed on instruments prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of survey meter calibrating facility		
Area exposure rate surveys are performed at appropriate intervals?		
Records of calibrations, surveys, etc. are maintained?		
Comments:		

8. PERSONNEL RADIATION MONITORING

Radiation protection program with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]

	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of Dosimeter provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/ to		
Comments *(include the maximum doses to workers during this review period*)		

9. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; loss; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers. [BSS - Section 3.12]

	Yes	**No**
Have any program changes been implemented that required, but did not receive, approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or accidents in Comments)*		
Have any significant structural or other safety related changes been made to the facilities or X ray equipment without approval of the RPA		
If yes, was a safety assessment performed by a Qualified Expert?		

Comments

10. WARNING SIGNS AND LABELLING

Proper warning signs in use areas and labelling of containers with radioactive material [BSS-Section I.23]

	Yes	**No**
Controlled areas have appropriate warning signs (in English)		
Entry to X ray rooms posted appropriately?		
Illuminated warning signs/lights functioning (where required)?		

Notices to workers are displayed as required?		
Comments		

11. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	**Yes**	**No**
Inspector made area and other measurements for comparison to operator's		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration)*		

12. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

13. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection by name and position?*

FORM SG 2A-DR-3

RADIATION PROTECTION AUTHORITY

INSPECTION OF RADIATION SOURCES IN MEDICAL DIAGNOSTIC RADIOLOGY

DETAILED INSPECTION RECORD

This inspection record/checklist deals with matters relevant to medical radiology

1. RESPONSIBILITIES *Justification and Optimization [BSS Apex II]*		
	Yes	**No**
Examinations with X ray are authorized by appropriately Qualified Practitioners?		

Has an appropriately Qualified Practitioner been designated as having overall responsibility for patient protection and safety?		
If yes, practitioner's name?		
Does this Qualified Practitioner ensure that exposures are justified?		
If yes, state how the Qualified Practitioner says is this achieved?		
Has the operator established Dose Guidance (or Reference) Levels?		
Have dose measurements been made at the facility for comparison to these levels?		
If yes, by whom, at what frequency and when last made?		
Does the facility undertake research involving exposure of humans to radiation?		
If yes, are procedures in place ensuring compliance with the Helsinki Declaration, and guidelines observing the requirements of the Council for International Organizations of Medical Sciences and of the World Health Organization?		
Are such exposures subject to the advice of an Ethics Committee or similar body within the facility?		
Does the facility conduct any screening programs?		
If yes, are standards available and followed?		
Are satisfactory procedures in place to properly identify patients?		
Are satisfactory procedures in place to identify potentially pregnant patients and, if clinically appropriate, to defer or modify the X ray examination?		

Are satisfactory steps taken to minimize the radiation dose during X ray examinations of the lower trunk of pregnant women (i.e. of the abdomen, pelvis, lumbar spine, etc.) when such examinations cannot be deferred?		

2. FACILITIES AND EQUIPMENT *Facilities as described; uses; control of access; engineering controls; shielding [BSS Section 2.34]*		
	Yes	**No**
Are the facilities as described in the application?		
Is access to the X ray equipment adequately controlled to prevent unauthorized use?		

Are adequate means (barriers, signs, procedures) used to prevent unauthorized individuals from entering controlled areas?		
Are X ray examinations performed with appropriate (purpose designed) equipment?		
EQUIPMENT COMPLIANCE AND MAINTENANCE (Quality Control)		
Is the X ray equipment subject to periodic testing (a QC program) to ensure the design and operating characteristics comply with the ISO/IEC or other requirements of the RPA?		
If so, at what frequency; by whom; date of the last test?		
Is the X ray equipment subject to routine maintenance by authorized service agents?		
Do the records confirm testing and maintenance?		

FILM, INTENSIFYING SCREENS, PROCESSING		
Is the speed of image receptors (intensifying screens and/or film) the highest commensurate with the required image quality?		
Does the x-ray film spectral sensitivity match that of the intensifying screens?		
Is the darkroom light tight?		
Is the safe lighting appropriate to the film type(s) in use (colour and wattage)?		
For manual processing of x-ray film		
- are appropriate facilities provided (tanks, temperature control, etc.)?		
- is the developer in use suitable for the films being developed?		
- is a suitable developer timer and developer thermometer available?		
- is the correct time-temperature chart for the developer and film displayed?		
- is time-temperature development routinely practiced?		
- is the temperature of the developer kept within the bounds specified by the manufacturer?		
- are the storage conditions of undeveloped x-ray film stocks satisfactory?		
Are appropriate quality control checks performed on the film/image processing equipment at regular intervals?		
Does the Radiation Protection Officer routinely review quality control checks and maintains records?		
PROTECTIVE DEVICES		
Appropriate numbers of lead protective aprons and gloves in good order?		

Protective screens for control console position provided where appropriate and in good order?		
Appropriate patient (eyes, gonads, etc) protective devices available and in good order?		
Is it apparent that these protective devices are being used routinely?		
Comments:		

FORM SG 2A-DR- 4

THE RADIATION PROTECTION AUTHORITY

INSPECTION OF RADIATION SOURCES IN DENTAL DIAGNOSTIC RADIOLOGY

This inspection record/checklist deals with matters relevant to dental radiology (facilities with intra-oral, panoramic (tomographic) or cephalometric X ray equipment).

3. RESPONSIBILITIES *Justification and Optimization [BSS Apex II]*		
	Yes	**No**
Examinations with X ray are authorized by appropriately Qualified Practitioners?		
Has an appropriately Qualified Practitioner been designated as having overall responsibility for patient protection and safety?		
If yes, practitioner's name?		
Does this practitioner ensure that exposures are justified?		
If yes, how is this achieved?		

Has the operator established Dose Guidance (or Reference) Levels?		
Have dose measurements been made at the facility for comparison to these levels?		
If yes, by whom, at what frequency and when last made?		
Are satisfactory procedures in place to properly identify patients?		
Does the facility undertake research involving exposure of humans to radiation?		
If yes, are procedures in place ensuring compliance with the Helsinki Declaration, and guidelines observing the requirements of the Council for International Organizations of Medical Sciences and of the World Health Organization?		
Are such exposures subject to the advice of an Ethics Committee or similar body?		
Does the facility conduct any screening programs?		
If yes, are standards available and followed?		

4. FACILITIES AND EQUIPMENT

Facilities as described; uses; control of access; engineering controls; shielding [BSS Section 2.34]

	Yes	**No**
Are the facilities as described in the application?		
Is access to the X ray equipment adequately controlled to prevent unauthorized use?		
Are adequate means (barriers, signs, and procedures) used to prevent unauthorized individuals from entering controlled areas?		

Are X ray examinations performed with appropriate (purpose designed) equipment?		
EQUIPMENT COMPLIANCE AND MAINTENANCE (Quality Control)		
Is the X ray equipment subject to periodic testing (a QC program) to ensure the design and operating characteristics comply with the ISO/IEC or other requirements of the RPA?		
If so, at what frequency; by whom; date of the last test?		
Is the X ray equipment subject to routine maintenance by authorized service agents?		
Do records confirm testing and maintenance?		
FILM, INTENSIFYING SCREENS, PROCESSING		
Is the speed of image receptor (intra-oral film and film used with intensifying screens) the highest commensurate with the required image quality?		
For film-screen combinations, does the X ray film spectral sensitivity match the intensifying screens?		
Is the darkroom (or dental processing unit) light tight?		
Is the safe lighting appropriate to the film type(s) in use (colour and wattage)?		
For manual processing of X ray film		
- are appropriate facilities provided (tanks, temperature control, etc.)?		
- is the developer in use suitable for the films being developed?		
- is a suitable developer timer and developer thermometer available?		

- is the correct time-temperature chart for the developer and film displayed?		
- is time-temperature development routinely practiced?		
- is the temperature of the developer kept within the bounds specified by		
the manufacturer?		
- are the storage conditions of undeveloped X ray film stocks satisfactory?		
Are appropriate quality control checks performed on the film/image processing equipment at regular intervals?		
Radiation Protection Officer reviews quality control checks and maintains records?		

PROTECTIVE DEVICES		
Patient protective apron(s) available and in good order?		
Operator's operator can stand at least 2 m from the patient and X ray tube during exposures?		
If no, is other satisfactory shielding in place?		
Patient holds intra-oral films during exposures?		
Is it apparent that these protective measures are being used routinely?		
Comments:		

APPENDIX 2B.

FORM SG 2B – NM-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES FOR RADIATION SOURCES IN NUCLEAR MEDICINE

INSPECTION RECORD SUMMARY

Inspection number	
Authorization number	

Name of the facility	
Address (location of the facility)	
Telephone Number	
Name of Radiation Protection Officer	
Name of Medical (or Hospital) Physicist	
Operator's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit time:**

Type of Inspection Pre-authorization Routine	☐ ☐
Investigational Termination	☐
Summary of Findings and Actions NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	☐ ☐ ☐
Recommended Date of NEXT Inspection	___/_____/_____
RPA Inspector name & signature Date	
Licensee name & signature	

FORM SG 2B – NM-2

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES FOR RADIATION SOURCES IN NUCLEAR MEDICINE

DETAILED INSPECTION RECORD

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each Practice. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not applicable*** *during the inspection a notation such as "Not Reviewed" or*

"Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, the demonstration should be described. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate the inspection findings. Copies of all relevant documents and records required to support item(s) of non-compliance should be attached to the report.

1. AMENDMENTS AND PROGRAM CHANGES *Prior to the inspection, list for review any licence amendments submitted by the operator and approved by the RPA since the last inspection*

2. INSPECTION AND ENFORCEMENT HISTORY *Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections*		
DATE	**INSPECTOR**	**VIOLATIONS**

3. INCIDENT / EVENT HISTORY *Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection*

4. ORGANIZATION AND SCOPE OF THE PROGRAM *Briefly describe the present scope of activities, including types and maximum activities at any time of authorized unsealed sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)*

5. RESPONSIBILITIES *Justification and Optimization [BSS App. II]*		
	Yes	**No**
Procedures are authorized by appropriately Qualified Practitioners, in accordance with the medical speciality for which the radioactive material is going to be applied to patients? (e.g. cardiologists, endocrinologists, nephrologists, etc.)		
Has an appropriately Qualified Practitioner been designated as having overall responsibility for patient protection and safety?		
If yes, practitioner's name?		
Does this practitioner ensure that procedures are justified?		
If yes, how the practitioner says is this achieved?		
Is the activity of radio-pharmaceuticals administered to patients within the range considered acceptable by the profession and the RPA?		
At what frequency is this reviewed, by whom and when reviewed last?		

Does the facility undertake research involving exposure of humans to radiation?		
If yes, are procedures in place ensuring compliance with the Helsinki Declaration, and guidelines observing the requirements of the Council for International and National standards?		
Are such procedures subject to the advice of an Ethics Committee or similar body within the facility?		
Are satisfactory procedures in place to properly identify patients before treatment?		
Are satisfactory procedures in place to identify potentially pregnant patients and, if clinically appropriate, to defer or modify the procedure?		
Comments:		

6. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response

	Yes	**No**
All persons working with radiation have prescribed qualifications and/or training?		
All occupationally exposed personnel are provided with initial safety training?		
Refresher radiation safety training is provided periodically?		
Adequate supervision of workers (technologists and lab assistants) by medical practitioners?		
Are training records maintained for each worker?		

Do interviews with personnel demonstrate an adequate level of understanding regarding safety and emergency procedures?		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments:		

7. **INTERNAL AUDITS AND REVIEWS**

	Yes	No
Operator reviews the radiation protection program at appropriate intervals?		
Audits of the facilities, source utilization log book, working rules and emergency procedures performed at appropriate intervals?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

8. FACILITIES AND EQUIPMENT

Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]

	Yes	**No**
Are the facilities as described in the application for authorization?		
Access to radioactive material adequately controlled?		
Radioactive material is secured to prevent unauthorized removal?		
Adequate methods used to prevent unauthorized individuals from entering controlled areas?		
Adequate fire protection?		
Operator possesses and uses a radionuclide activity meter?		
Quality control checks (constancy, linearity, accuracy, geometry) of the radionuclide activity meter are conducted as specified by the manufacturer?		
Corrections factors calculated and used to accurately measure β emitting radio-pharmaceuticals (e.g. ^{89}Sr, ^{32}P, ^{153}Sm)		
Is the imaging equipment subject to QC testing to ensure the design and operating characteristics comply with the ISO/IEC or other requirements of		
the RPA?		
If so, at what frequency; by whom; date of the last test?		
RPO maintains records and ensures that appropriate personnel (the medical physicist etc.) reviews results of quality control checks?		
Comments:		

9. UNSEALED RADIATION SOURCES	**Yes**	**No**
Radionuclides, chemical form, maximum activities at any time, and uses are as authorized and confirmed by the source utilization log book?		
Operator obtains prepared doses from an authorized radio- pharmaceutical supplier?		
Supplier's name, address		
Operator obtains and uses $^{99}Mo/^{99m}Tc$ generators?		
99 Mo breakthrough tests performed as required?		
Comments:		

10. RECEIPT AND TRANSFER OF RADIATION SOURCES	**Yes**	**No**
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		

Records of packaging surveys, source receipt and transfer maintained?		
Comments		

11. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

Radiological surveys; leak tests; source existence checks; handling of radioactive materials; records; contamination control [BSS - Section I.38]

	Yes	**No**
Operator possesses appropriate, functioning survey instrument(s)?		
Suitable function checks are performed on instruments prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Area exposure rate surveys are performed at appropriate intervals?		
Surveys for removable contamination, including fume cupboards, conducted as required?		
Records of calibrations, contamination surveys, etc. maintained?		
Comments:		

12. PERSONNEL RADIATION MONITORING *Radiation protection program with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]*	**Yes**	**No**
Practice provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the Licensee apply the optimization principle (ALARA) to occupational exposure?		
Potential for exposure of workers to airborne radioactive material exists?		
Monitoring for airborne radioactivity conducted?		
For radioactive gases (e.g. ^{133}Xe) ventilation rates checked to ensure negative pressure in use areas?		
Spilled gas clearance times calculated and posted as appropriate?		
Bioassay program established and implemented as appropriate?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/ to		
Comments *(include the maximum doses to workers during this review period*)		

13. RADIO-PHARMACEUTICAL THERAPY

	Yes	No
Appropriate written safety instructions are provided to patients and nursing staff commensurate with the therapy administered?		
The safety precautions at the facility include appropriate administration/treatment rooms, patient toilet facilities, warning signs, controlled visiting times, patient safety guidance, release and contamination controls?		
Discharge of patients complies with approved procedures?		
Patient treatment rooms are surveyed for contamination following patient release?		
Appropriate procedures have been established in case of premature death of patients undergoing treatment (including post mortem, cremations, etc)?		
Thyroid uptake measured on workers involved with administration of radioiodine?		
Records of procedures, treatments and other measurements maintained?		
Comments:		

14. RADIOACTIVE WASTE MANAGEMENT

Disposal or transfer of sources; packaging, control, and tracking procedures; records [BSS Section III.8]

	Yes	No
Radioactive effluents released to restricted area?		
Releases comply with regulatory requirements?		
Decay-in-storage method used?		
Storage facilities comply with regulations?		
Control and fire safety satisfactory?		
Warning and notification signs (in Endlish) satisfactory?		
Inventory of store contents checked at acceptable intervals?		
Disposals in accordance with regulatory requirements?		
Records maintained?		
Comments:		

15. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No. TS-R-1

	Yes	No
Does transport of radioactive material (from supplier, by operator) comply with IAEA regulations?		
Approved packages used?		

Packages properly labelled and marked?		
Supplier's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
Comments		

16. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; losses; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers [BSS – Section 3.12]

	Yes	**No**
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If not reported, list the incidents or accidents in Comments)*		
Have any significant structural or other safety related changes been made to the facilities without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		
Comments		

17. WARNING SIGNS AND LABELLING

Proper warning signs in use areas and labelling of containers with radioactive material [BSS-Section I.23]

	Yes	No
Controlled areas have appropriate warning signs (in the local language)?		
Containers of radioactive material are properly labelled?		
Notices to workers are displayed as required?		
Radiopharmaceutical containers, storage areas, etc. are labelled as appropriate?		

Comments

18. INDEPENDENT AND CONFIRMATORY MEASUREMENTS

	Yes	No
Inspector made area and other measurements for comparison to operator's		

Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*

19. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

20. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*

APPENDIX 2C.

FORM 2C – RT-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES FOR RADIATION SOURCES IN RADIOTHERAPY (RT)

INSPECTION RECORD SUMMARY

Inspection number	
Authorization number	

Name of the Facility	
Address (location of the facility)	
Telephone Number	
Name of Radiation Protection Officer	
Name of the Medical (or Hospital) Physicist	
Licensee's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit time:** _____

Type of Inspection Pre-authorization Routine Investigational Termination	☐ ☐ ☐ ☐
Summary of Findings and Actions NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	 ☐ ☐ ☐
Recommended Date of NEXT Inspection	_____/_____/____
RPA Inspector name &signature Date	
Licensee name & signature **Date**	

FORM 2C – RT-2

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES FOR RADIATION SOURCES IN RADIOTHERAPY (RT)

DETAILED INSPECTION RECORD

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each authorized facility. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not applicable*** *during the inspection a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.*

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In

addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, the demonstration should be described.. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate the inspection findings.Copies of all relevant documents and records required to support item(s) of non-compliance should be attached.

***This inspection record/checklist is divided into THREE parts**. The first deals with*
*matters generally common to radiotherapy. The second with specific issues for X ray and electron therapy and cobalt teletherapy and the third with brachytherapy (implants and devices). The officer should use the **common** radiotherapy section of the form plus the relevant **second or third** parts as applicable to the Practice and each type of radiation source**.***

1. AMENDMENTS AND PROGRAM CHANGES *Prior to the inspection, list for review any amendments submitted by the Licensee and approved by the RPA since the last inspection*

2. INSPECTION AND ENFORCEMENT HISTORY *Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections*		
DATE	**INSPECTOR**	**VIOLATIONS**

3. INCIDENT/EVENT HISTORY

Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection

4. ORGANIZATION AND SCOPE OF THE PROGRAM

Briefly describe the present scope of activities, including types and quantities of use involving authorized sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)

5. RESPONSIBILITIES

Justification [BSS App. II]

	Yes	**No**
All treatments authorized by appropriately Qualified Practitioners?		
An appropriately Qualified Practitioner is designated as having overall responsibility for patient protection and safety?		
If yes, practitioner's name?		
Does this Qualified Practitioner ensure that procedures are justified?		
If yes, how is this achieved?		
All patient have an individual treatment plan determined performed by a Medical Physicist?		
If yes, Medical (or hospital) Physicist's name?		
Is always at least one radiotherapist present at the facility while patients are being irradiated?		
Are satisfactory procedures in place to properly identify patients before treatment?		
Does the facility undertake research involving exposure of patients to radiation?		
If yes, are procedures in place ensuring compliance with the Helsinki Declaration, and guidelines observing the requirements of the Council for International Organizations of Medical Sciences and of the World Health Organization?		
Are such procedures subject to the advice of an Ethics Committee or similar body within the facility?		

Comments:

6. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response

	Yes	**No**
All personnel using radiation sources have recognized qualifications?		
All occupationally exposed personnel are provided with initial safety training?		
Refresher radiation safety training is provided periodically?		
Supervision of personnel (e.g. technologists) by specialist Medical Practitioners is satisfactory?		
Training records kept for each worker?		
Interviews with workers demonstrate an appropriate knowledge of safe working rules and emergency procedures (e.g. source recovery?)		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments		

7. INTERNAL AUDITS AND REVIEWS

	Yes	No
Licensee reviews the radiation protection programme at appropriate intervals?		
Audits of the facilities, source inventory, working rules and emergency procedures performed at appropriate intervals?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

8. FACILITIES AND RADIATION SOURCES

Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]

	Yes	**No**
FACILITIES		

Facilities are as described in the authorization application?		
Radiation sources are secured so as to prevent unauthorized use and removal?		
Access to controlled areas by unauthorized persons properly supervised?		
Suitable emergency equipment for radioactive source recovery is available?		
Fire protection satisfactory?		
COMPLIANCE, MAINTENANCE, AND REPAIR (Quality Control)		
The design and performance characteristics of radiation devices, whether using radioactive sources or electrically generated radiation, comply with relevant IEC/ISO standards or other requirements of the RPA?		
Radiation devices are subject to regular QC tests to ensure continued compliance?		
If so, at what frequency; by whom; date of last test?		
Radiation devices are subject to routine maintenance by authorized service agents?		
If so, at what frequency, by whom; date last maintenance		
Records of compliance tests, maintenance, inspection and service maintained?		
OPERATING CHECKS AND CALIBRATION		

Appropriate checks of the performance and functionality of radiation devices and their associated safety equipment have been prescribed by a medical physicist and are carried out daily and at other suitable periods (where relevant to the device)?		

These checks are performed by the Medical Physicist or the results of these checks are reviewed by him/her within the day?		
Radiation devices are calibrated using acceptable protocols?		
A complete calibration of each device is performed		
- before the device is first used for patient treatment?		
- routinely at prescribed intervals acceptable to the RPA?		
- if routine operating checks show output variations outside established limits?		
- after major repair or modification?		
- using instruments with calibrations traceable to an approved standard?		
- by a Medical Physicist recognized by the RPA?		
Records of operating checks and calibrations are maintained?		
STORAGE OF RADIOACTIVE SOURCES		
Storage facilities for radioactive sources complies with regulations?		
Control and fire safety satisfactory?		
Warning and notification signs satisfactory?		
Inventory of store contents checked at acceptable intervals?		
RADIATION SOURCES		
Radioactive sources (cobalt unit, sealed sources) at the facility are as authorized?		
X ray equipment (interstitial, superficial, deep X ray therapy), linear accelerators, etc. at the facility are as authorized?		
Leak tests are performed on sealed radioactive sources at prescribed intervals?		
Procedures are in place for appropriate action to be taken in the event of an unacceptable leak test?		

Licensee confirms the inventory of radiation sources at acceptable intervals?		
Records of radioactive source leak tests and source inventory maintained?		
Comments:		

9. RECEIPT AND EVENTUAL DISPOSAL OF RADIATION SOURCES		
	Yes	**No**
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		
Satisfactory procedures are in place for the disposal of radiation sources that are no longer required (whether radioactive sources or devices that generate radiation electrically) e.g. disposal only to authorized persons (indicate to whom in "Comments"); notification to the RPA, etc.?		
Records of packaging surveys, source receipt and disposal maintained?		
Comments		

10. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

Radiological surveys; leak tests; inventories; handling of radioactive materials; records; contamination control [BSS - Section I.38]

	Yes	No
Operator possesses appropriate, functioning survey instrument(s)?		
Suitable function checks are performed on instruments prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Area exposure rate surveys are performed at appropriate intervals?		
Surveys for removable contamination conducted as required?		
Records of calibrations, contamination surveys, etc. maintained?		
Comments:		

11. PERSONNEL RADIATION MONITORING

Radiation protection program with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]

	Yes	No
Licensee provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		

Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/ to		
Comments *(include the maximum doses to workers during this review period*)		

12. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No.

TS-R-1

	Yes	**No**
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labeled and marked?		
Transporter’s vehicles, if used for transport, comply with regulations?		

Shipper’s declaration papers have correct details and used when shipping sources?		
Comments		

13. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; losses; incidents; overexposures; safety-related equipment failures; change in RPO and Medical (or hospital)Physicist, and radiation dose reports to workers [BSS - Section 3.12]

	Yes	**No**
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or accidents in Comments)*		
Have any significant structural or other safety related changes been made to the facilities or the radiation devices without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		
Comments		

14. WARNING SIGNS AND LABELING

Proper warning signs in use areas and labeling of containers with radioactive material [BSS-Section I.23]

	Yes	No
Controlled areas have appropriate warning signs in English		
Containers of radioactive sources are properly labeled?		
Notices to workers are displayed in the local language?		
Entry to treatment rooms has appropriate warning signs?		
Comments		

15. INDEPENDENT AND CONFIRMATORY MEASUREMENTS

	Yes	No
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

16. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES

List any breaches noted during the inspection (what, when, where and who)

17. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*

Comments:

FORM SG 2C – XRT-3

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES FOR RADIATION SOURCES IN X-RAY NAD TELEPATHY RADIOTHERAPY (RT)

DETAILED INSPECTION RECORD

This inspection record/checklist deals with matters relevant to superficial X ray therapy, deep X ray therapy, linear accelerators and cobalt teletherapy. Record each device on a separate Inspection Record,

Authorization Number	
Device Manufacturer	
Device Model	
Device Serial Number	
For ^{60}Co teletherapy unit: Total Activity & Activity Calibration Date	
Location on premises	

	Yes	**No**
FACILITIES. Where relevant, are the following operational		

- room entrance barrier/door interlock system?		
- waning signs satisfactory?		
- photon/electron selection and any other beam parameter interlocks?		
- area radiation monitor(s)?		
- beam ON indication?		
- patient viewing and intercom systems?		
OPERATION		
Is the device restricted to particular orientations and/or gantry angles?		
If so, is operation prevented in other orientations?		
OPERATING PROCEDURES		
Operating procedures (in the local language) located at the control console?		
Procedures include response to emergencies or abnormal situations?		
Emergency response telephone numbers clearly displayed?		
Patient is sole occupant in the treatment room during treatment?		
All patients have an individual dosimetric treatment planning performed by the Medical Physicist?		
Qualified staff (Medical Physicist, Radiation Oncologist etc.) physically present throughout all treatments with a gamma stereotactic/radiosurgery devices?		
OPERATIONAL CHECKS AND CALIBRATION		
Were operational checks performed before use today (or when last used)?		
Was any operational fault detected at that check?		
If yes, was appropriate corrective action taken?		
Date last fully calibrated?		
Records confirm checks, calibrations and related actions?		

Comments	FORM SG 2C - BRT- 4

INSPECTION RECORD

RADIOTHERAPY– BRACHYTHERAPY (PART 3)

This inspection record/checklist deals with matters pertaining to devices which use radioactive sources for brachytherapy, e.g. afterloaders, high dose rate therapy (HDR), etc. Record each on a separate Inspection Record.

Authorization Number	
Device Manufacturer	
Device Model	
Device Serial Number	
Radionuclide, Total Activity, Activity Calibration Date	
Number & Type of Sealed Sources	
Types of Treatments	
Location on premises	

	Yes	**No**
FACILITIES. Where relevant, are the following operational		

- room entrance barrier/door interlock system?		
- waning signs satisfactory?		
- area radiation monitor(s)?		

- source ON indication?		
- patient viewing and intercom systems?		
- appropriate emergency source recovery and storage equipment available?		
PROCEDURES		
For devices containing sources (e.g. afterloaders, HDR, etc) operating procedures (in the local language) are located at or near the control?		
Safe nursing procedures (in the local language) are available and explained to all relevant personnel including controlling patients and visitors, contamination control and the size/appearance of sources, emergency procedures?		
Emergency response telephone numbers clearly displayed?		
Functional survey meter immediately available?		
Survey meter's last calibration date?		
Patient is sole occupant in the treatment room?		
Portal alarm at room entrance?		
Medical Physicist		
- performs patient's individual dosimetric treatment planning?		
- surveys patients immediately after implant completed?		
- surveys patients immediately after removal of implant and confirms source inventory before patient leaves treatment area?		

- is physically present throughout all patient treatments with a gamma stereotactic/radiosurgery devices?		
- is physically present when patient treatment with remote afterloaders initiated?		
OPERATIONAL AND DOSE RATE CHECKS		
If a radiation device,		
- are operational checks performed before use on patients?		
- was any operational fault detected at that check?		
If yes, was appropriate corrective action taken?		
Date of dose rate last re-assessment by medical physicist?		
Records confirm checks, dose rate assessment and related actions?		

Comments

APPENDIX 2D

INSPECTION FORMS FOR RADIATION SOURCES IN INDUSTRIAL RADIOGRAPHY

FORM SG 2D-IR-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES AND RECORDS OF RADIATION SOURCES IN INDUSTRIAL RADIOGRAPHY

INSPECTION RECORD SUMMARY

INDUSTRIAL RADIOGRAPHY

Inspection number	

Authorization number	

Name of the authorized legal person	
Address of Legal Person's principal premises:	
Address (location of the site inspected if other than principal premises)	
Telephone Number	
Name of Radiation Protection Officer	
Name of legal person's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit time:**

Type of Inspection Pre-authorization Routine Investigational Termination	☐ ☐ ☐ ☐
Recommended Date of NEXT Inspection	_____/_____/_____
Summary of Findings and Actions NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	☐ ☐ ☐
RPA Inspector name & signature Date	
Licensee's name & signature Date	

FORM SG 2D-IR-2

INSPECTION RECORD

INDUSTRIAL RADIOGRAPHY

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each licensed facility. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not relevant*** *during the inspection a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.*

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, describe those demonstrations. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate your inspection findings. Attach copies of all relevant documents and records required to support item(s) of non-compliance.

1. AMENDMENTS AND PROGRAM CHANGES *Prior to the inspection, list for review any licence amendments submitted by the operator and approved by the RPA since the last inspection*

2. INSPECTION AND ENFORCEMENT HISTORY

Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections

DATE	INSPECTOR	VIOLATIONS

3. INCIDENT / EVENT HISTORY

Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection

4. ORGANIZATION AND SCOPE OF THE PROGRAM

Briefly describe the present scope of activities, including types and quantities of use involving licensed sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)

5. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response

	Yes	No
Do all Industrial Radiographers have a suitable level of training?		
Do all industrial radiography assistants have a suitable level of training?		
Refresher radiation safety training is provided periodically?		
Are radiography assistants directly supervised by a competent person at all times?		
Are training records maintained for each worker?		
Do interviews with Industrial Radiographers and assistants demonstrate an appropriate level of understanding of safe working rules and emergency procedures (e.g. source recovery?)		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization certificate, the legislation, conditions, safe working procedures, etc.?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		

Comments:

6. INTERNAL AUDITS AND REVIEWS		
	Yes	No
Operator reviews the radiation protection program at appropriate intervals?		
Audits of the facilities, source inventory, working rules and emergency procedures performed at appropriate intervals?		
Frequency		
Operator conducts regular audits of employees working at field sites?		
Audits conducted by		
Records of program reviews and audits maintained?		
Comments		

7. FACILITIES AND EQUIPMENT *Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]*		
	Yes	**No**
At the principal authorized premises		
- are the facilities as described in the application for authorization?		
- is access to radiation sources restricted to authorized persons only?		
- are radiation sources properly secured to prevent unauthorized removal?		

- is a source (x and γ) movement register maintained and up to date?		
- is the store for radiation sources (all types) secure?		
- does the store for radioactive sources bear appropriate warning signs (in the local language)?		
- are fire protection measures adequate?		
- are adequate methods used to prevent unauthorized individuals from the enclosures for radiography?		
- appropriate emergency equipment is available in order to properly deal with the retrieval of jammed sources, etc.?		
At the inspected field site		
- are adequate methods used to prevent unauthorized individuals from entering irradiation zones?		
- is access to irradiation zone restricted to authorized persons only?		
- are radiation sources properly secured to prevent unauthorized removal?		
- is the transitory store for radiation sources secure?		
- does the store for radioactive sources bear appropriate warning signs (in the local language)?		
- are fire protection measures adequate?		
- appropriate emergency equipment is available in order to properly deal with the retrieval of jammed sources, etc.?		

8. RADIATION SOURCES	**Yes**	**No**
Radiation sources and uses are as authorized?		
Leakage tests are periodically performed on sealed sources (other than those subject to frequent replacement such as ^{192}Ir)? e.g. ^{137}Cs crawler control sources, ^{60}Co, etc.?		

Inventory of sealed sources maintained? (inspector to confirm)		
Decayed radiation sources (e.g. ^{192}Ir) disposed of where?		
Records of leakage tests and inventory maintained?		
Are the source containers, X ray equipment and crawler control sources subject to periodic testing to ensure the design and operating characteristics comply with the IEC/ISO or other requirements of the RPA?		
Collimating devices are provided with every radiation source (x and γ) and used whenever practicable?		
If so, at what frequency; by whom; date of the last test?		
Radioactive source containers		
- are properly labelled (as radioactive, details of the contained source, contacts)?		
- have key locks and, if not in immediate use, are locked?		
- meet the minimum length requirement for wind-out and delivery cables?		
- are subject to wear testing, source disconnect checks and maintenance procedures in compliance with the manufacturer's requirements?		
X ray equipment		
- is key operated?		
- meets the minimum length requirements for connecting cables?		
- is fitted with filtration appropriate to the task?		
- for crawler equipment, is fitted with appropriate exposure warning device (e.g. klaxon)?		
- for crawler equipment, is fitted with a safety shut-off switch to be activated prior to removal of the equipment from the pipe?		

RPO keeps records of testing, compliance and maintenance?		
Comments:		

9. RECEIPT AND TRANSFER OF RADIATION SOURCES		
	Yes	**No**
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		
Satisfactory procedures are in place for the disposal of radiation sources that are no longer required. e.g. disposal only to authorized persons;		
notification to the RPA, etc.?		
Records of packaging surveys, source receipt and transfer maintained?		
Comments		

10. AREA RADIATION SURVEYS

Radiological surveys; leak tests; inventories; handling of radioactive materials; records; [BSS – Section I.38]

	Yes	No
Operator possesses appropriate, functioning radiation survey instrument(s) suitable for the detection and measurement of x and/or γ radiation as appropriate?		
Operator performs proper function checks on instruments prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Sufficient functional survey meters are available for each radiography operation? (i.e. for each Industrial Radiographer and assistant team)		
Direct reading pocket dosimeters performance checked at appropriate intervals?		
Sufficient functional direct reading pocket dosimeters are available for each radiography worker?		
Area exposure rate surveys are performed at appropriate intervals?		
Is it evident that workers always use a survey meter at the conclusion of every exposure to confirm that the radioactive source has been returned to its container?		
Surveys for removable contamination conducted as required?		
Records of calibrations, contamination surveys, etc. maintained?		
Comments:		

11. PERSONNEL RADIATION MONITORING *Radiation protection program with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]*		
	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Personnel monitoring (reading pocket dosimeters and personal dosimeters) records are maintained?		
Dosimetric results of both systems are in acceptable agreement?		
Inspector reviewed both personnel monitoring records for the period from/to		
Comments *(include the maximum doses to workers during this review period*)		

12. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No. TS-R-1]

	Yes	No
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labelled and marked?		
Operator's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		

Comments

13. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; loss; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers [BSS - Section 3.12]

	Yes	No
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or accidents in Comments)*		
Have any significant structural or other safety related changes been made to the principal facilities or to radiation devices without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		
Comments		

14. WARNING SIGNS AND LABELLING

Proper warning signs in use areas and labelling of containers with radioactive material [BSS - Section I.23]

	Yes	No
Controlled areas, including field sites (if relevant for this inspection), have appropriate barriers and warning signs (in the local language)?		
Devices containing radiation sources are properly labelled?		
Notices to workers (in the local language) are displayed as required?		
Comments		

15. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	Yes	No
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

16. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

17. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*

APPENDIX 2E

INSPECTION FORMS FOR RADIATION SOURCES IN RESEARCH AND INDUSTRIAL IRRADIATORS

FORM SG 2E-RIR-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES AND RECORDS OF RADIATION SOURCES IN RESEARCH AND INDUSTRIAL IRRADIATORS

INSPECTION RECORD SUMMARY

IRRADIATOR

Inspection number	
Authorization number	

Name of the Facility	
Address (location of the facility)	
Telephone Number	
Name of Radiation Protection Officer	

Legal person's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit**

Type of Inspection	Pre-authorization Routine Investigational Termination	**tim e:**
Recommended Date of NEXT Inspection		_____/_____/_____
Summary of Findings and Actions	NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	
RPA Inspector name & signature Date		
Licensee Name's & signature Date		

FORM SG 2E-RIR-2

INSPECTION RECORD

IRRADIATOR

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each authorized facility. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not relevant*** *during the inspection (the form may be adapted to irradiators using either* ***radioactive substances*** *or* ***electrically generated radiation****) a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable*

All areas covered during the inspection should be documented in sufficient detail to describe what activities and procedures were observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrated any practices at your request, describe those demonstrations. The observations and demonstrations you describe in this report, along with measurements and some records review, should substantiate your inspection findings. Attach copies of all operator's documents and records needed to support items of non-compliance.

1. AMENDMENTS AND PROGRAM CHANGES *Prior to the inspection, list for review any licence amendments submitted by the operator and approved by the RPA since the last inspection*

2. INSPECTION AND ENFORCEMENT HISTORY

Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections

DATE	INSPECTOR	VIOLATIONS

3. INCIDENT / EVENT HISTORY

Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection

4. ORGANIZATION AND SCOPE OF THE PROGRAM *Briefly describe the present scope of activities, including types and quantities of use involving authorized sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)*

5. TRAINING AND INSTRUCTION OF WORKERS *Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response*		
	Yes	**No**
All occupationally exposed personnel are provided with initial safety training?		
Refresher radiation safety training is provided periodically?		
Proper supervision of workers by appropriately trained persons?		
Are training records maintained for each worker?		
Do interviews with workers demonstrate an adequate level of understanding of safe working rules and emergency procedures?		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA), the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments:		

6. INTERNAL AUDITS AND REVIEWS

	Yes	No
Operator reviews the radiation protection programme at appropriate intervals?		
Audits of the facilities, source inventory, working rules and emergency procedures performed at appropriate intervals?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

7. FACILITIES AND EQUIPMENT

Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]

	Yes	**No**
Are the facilities as described in the authorization application?		
Is the irradiator subject to periodic testing to ensure the design and operating characteristics comply with the IEC/ISO or other requirements of the RPA?		

If yes, by whom, date of last test?		
Do those checks include		
- each aspect of the system controlling access to and emergency exit (e.g. safe life system) from the irradiation room?		
- source position (or beam ON) indication?		
- emergency source return (or beam OFF) control?		
- heat/smoke detectors, fire extinguisher system?		
- assessment of potential radiation damage to electrical wiring?		
- ozone concentration measurement, if needed?		
For radioactive sources		
- confirmation that water circulation system is leak tight?		
- pool water replacement system high and low water indicators?		
- assessment of water volumes added to the pool to determine if there is		
pool leakage?		
- water conductivity and analysis?		
Is repair and maintenance of the irradiator performed periodically by the manufacturer or other persons specifically authorized by the RPA?		
If yes, name of organization, date of last maintenance		
Are malfunctions and defects found during inspection and maintenance checks repaired without delay?		
Is access to the radiation source(s) adequately controlled?		
Are radioactive sources secured to prevent unauthorized removal?		
Are adequate procedures in place to prevent unauthorized individuals from entering controlled areas?		
Is the store for radioactive sources secure?		
Does the store bear appropriate warning signs (in the local language)?		

Is the level of fire protection in the store satisfactory?		
RPO keeps records of checks, maintenance and follow up actions?		
Comments		

8. RADIATION SOURCES	**Yes**	**No**
Radioactive sources (radionuclides, activities and uses) at the facility are as authorized?		
Other irradiators (e.g. linear accelerators, etc) at the facility are as authorized?		
Are sealed radioactive sources leak tested at prescribed intervals?		
Are leak tests performed in accordance with approved procedures?		
Have any sealed radioactive sources been found to be leaking?		
If yes, were appropriate actions taken and the RPA notified?		
Records of leakage tests and inventory maintained?		
Comments:		

9. RECEIPT AND TRANSFER OF RADIATION SOURCES

	Yes	No
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		
Satisfactory procedures are in place, if relevant, for the disposal of radiation sources that are no longer required. (e.g. disposal only to authorized persons; notification to the RPA, etc.)?		
Records of packaging surveys, source receipt and transfer are maintained?		
Comments		

10. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

Radiological surveys; leak tests; inventories; handling of radioactive materials; records; contamination control [BSS – Section I.38]

	Yes	No
Operator possesses appropriate functioning survey meters?		
Suitable function checks are performed on survey meters prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Date of last calibration		
Area exposure rate surveys are performed at appropriate intervals?		
Are appropriate and functioning conductivity meters possessed and used?		

Are conductivity meters calibrated at appropriate intervals?		
Is the location, sensitivity and function of fixed radiation monitor to detect sources that may be carried by the product conveyor system satisfactory?		
Is the location, sensitivity and function of fixed monitor(s) used to detect the presence of high radiation levels in the irradiation room satisfactory?		
Is the function and sensitivity of monitor(s) used to detect contamination of the pool water due to a leaking source satisfactory?		
Is the function of all monitors routinely tested at prescribed intervals?		
Records of calibrations, surveys, tests, conductivity measurements etc. maintained?		
Comments		

11. PERSONNEL RADIATION MONITORING

Radiation protection program with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]

	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		

Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/ to		
Comments *(include the maximum doses to workers during this review period*)		

12. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No. TS-R-1

	Yes	**No**
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labelled and marked?		
Operator's vehicles, if used for any transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
Comments		

13. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; loss; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers. [BSS - Section 3.12]

	Yes	No
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or accidents in Comments)*		
Have any significant structural or other safety related changes been made to the facilities or irradiator without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		

Comments

14. WARNING SIGNS AND LABELLING

Proper warning signs in use areas and labelling of containers with radioactive material [BSS-Section I.23]

	Yes	No
Controlled areas have appropriate warning signs (in the local language)?		
Containers of radioactive material are properly labelled (with hazard warnings in the local language)?		

Notices to workers are displayed as required?		
High radiation areas properly identified?		
Comments		

15. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	**Yes**	**No**
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

16. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

17. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*

APPENDIX 2F

INSPECTION FORM FOR RADIATION SOURCES IN GAUGES

FORM SG 2F-G-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES AND RECORDS OF RADIATION SOURCES IN GAUGES

INSPECTION RECORD SUMMARY

GAUGES (PART 1)

Inspection number	
Authorization number	

Name of the facility	
Address (location of the site inspected)	
Telephone Number	
Name of Radiation Protection Officer	
Licensee's representative for the inspection	
Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit**

Type of Inspection	Pre-authorization	**tim e:**
	Routine	☐
	Investigational	☐
	Termination	☐
Recommended Date of NEXT Inspection		_____/_____/_____
Summary of Findings and Actions		
	NO items of non-compliance found	☐
	Items of non-compliance found	☐

Follow-up on previous non-compliance	☐
RPA Inspector name & signature Date	
Licensee's name & signature Date	

FORM SG 2F-G-2

INSPECTION RECORD

GAUGES (PART I)

The inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each authorized facility. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas ***not examined*** *or* ***not relevant*** *during the inspection a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.*

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, describe those demonstrations. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate your inspection findings. Attach copies of all relevant documents and records required to support item(s) of non-compliance.

This inspection record/checklist is divided into THREE parts*. The first deals with matters common to fixed, portable and in-stream radioactive gauges. The second with specific issues for what may be termed "fixed" gauges i.e. those installed on vessels for level detection, on pipelines and conveyor belts for density and/or weight measurement. That part includes in-stream analysis gauges where the radiation source is immersed in a slurry. The third part deals with portable gauges i.e. neutron moisture/density gauges such as those used in road construction and related activities.*

*The officer should use the **common** first part plus either the **second or third** part as applicable to the authorized use. **For fixed or portable X ray gauges** (electrically generated X rays), complete the sections and items that are relevant.*

1. AMENDMENTS AND PROGRAM CHANGES

Prior to the inspection, list for review any authorization amendments submitted by the operator and approved by the RPA since the last inspection

2. INSPECTION AND ENFORCEMENT HISTORY

Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections

DATE	INSPECTOR	VIOLATIONS

3. INCIDENT / EVENT HISTORY

Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection

4. ORGANIZATION AND SCOPE OF THE PROGRAM *Briefly describe the present scope of activities, including types and quantities of use involving authorized sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)*

5. INTERNAL AUDITS AND REVIEWS

	Yes	No
Operator reviews the radiation protection program at appropriate intervals?		
Audits of the facilities, source inventory, working rules and emergency procedures performed at appropriate intervals?		
Operator conducts regular audits of employees working at field sites?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

6. RECEIPT AND TRANSFER OF RADIATION SOURCES

	Yes	**No**
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		
Satisfactory procedures are in place for the disposal of radiation sources that are no longer required. e.g. disposal only to authorized persons; notification to the RPA, etc.?		
Records of packaging surveys, source receipt and transfer maintained?		
Comments		

7. TRANSPORT OF RADIOACTIVE SOURCES *IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No. TS-R-1*		
	Yes	**No**
Does transport of radioactive sources (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labeled and marked?		
Operator's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
Comments		

8. WARNING SIGNS AND LABELLING *Proper warning signs in use areas and labeling of containers with radioactive material [BSS-Section I.23]*		
	Yes	**No**
Controlled areas have appropriate warning signs (in the local language)?		
Gauges housings are properly labeled (hazard warning in the local language)?		

Notices to workers are displayed in the local language?		
Comments		

9. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; loss; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers. [BSS - Section 3.12]

	Yes	**No**
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or*		
accidents in Comments)		
Have any significant structural or other safety related changes been made to the facilities or radiation sources without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		
Comments		

10. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

11. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*

FORM SG 2F-G-3

INSPECTION RECORD

GAUGES – FIXED (PART 2)

This inspection record/checklist *deals with matters pertaining to "fixed" gauges i.e. those installed on vessels for level detection, on pipelines and*

conveyor belts for density and/or weight measurement. It includes in-stream analysis gauges where the radiation source is immersed in a slurry.

X ray Gauges *- Complete relevant items for gauges that use electrically generated X rays*

1. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response

	Yes	No
Is basic radiation safety training provided to all persons who may be required to work in the vicinity of a gauge?		
Is more advanced training given to personnel whose tasks require them to install or work in close proximity to a gauge or where there is the potential for exposure to the useful radiation beam (e.g. during maintenance inside bins or hoppers fitted with level gauges)?		
For in-stream analysis gauges, are workers responsible for replacing protective source windows provided with special training?		
Refresher radiation safety training is provided periodically?		
Are training records maintained for each worker?		
Do interviews with workers demonstrate an adequate level of understanding regarding safety and emergency procedures?		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments:		

2. FACILITIES AND EQUIPMENT *Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]*		
	Yes	**No**
Are the facilities as described in the authorization application?		
Is access to gauges in use adequately controlled by		
- appropriate area warning signs (in the local language)?		
- physical barriers, where appropriate?		
Except for in-stream analysis gauges, is access to the useful radiation beam prevented by physical barriers?		
Are adequate controls in place to prevent unauthorized persons from entering controlled areas and from accessing the useful radiation beam?		
Do the design and performance characteristics of the gauges comply with relevant IEC/ISO standards or other requirements of the RPA?		
Are gauges subject to regular testing to ensure continued compliance?		
If so, at what frequency; by whom; date of last test?		
Are gauges subject to routine maintenance by authorized service agents?		
If so, at what frequency, by whom; date last maintenance?		
Are adequate controls in place to ensure that all gauges are secured from unauthorized removal? e.g. through training of personnel and by ensuring that the RPO is given prior notification of any work requiring a gauge to be removed from its usual site, or of planned work in a bin or hopper to which gauges are fitted?		

Is the store for radioactive gauges currently not in use		
- Properly identified and sign posted (in the local language)?		
- Unlikely to be affected by the storage of other potentially hazardous substances?		
Records of compliance tests, maintenance, inspection and service maintained?		
Comments:		

3. RADIATION SOURCES	**Yes**	**No**
Radionuclides, chemical form, activities and uses as authorized in the authorization certificate, i.e. inventory confirmed? (Also confirm inventory for X ray gauges)		
Leakage tests performed on sealed sources (other than in-stream analysis gauges)?		
For in-stream analysis gauges, is the source protective window routinely checked for contamination by an approved method when replaced?		
Records of leakage tests and inventory maintained?		
Comments:		

4. PERSONNEL RADIATION MONITORING

Radiation protection programme with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]

	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/ to		
Comments *(include the maximum doses to workers during this review period*)		

5. TRANSPORT OF RADIOACTIVE SOURCES *IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No. TS-R-1*		
	Yes	**No**
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labeled and marked?		
Operator's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
Comments		

6. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	**Yes**	**No**
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

FORM SG 2F-G-4

INSPECTION RECORD

GAUGES – PORTABLE (PART 3)

This inspection record/checklist deals with portable gauges i.e. neutron moisture/density gauges such as those used in road construction and related activities.

1. TRAINING AND INSTRUCTION OF WORKERS

Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response

	Yes	No
All occupationally exposed personnel are provided with initial safety training?		
Refresher radiation safety training is provided periodically?		
Are training records maintained for each worker?		
Do interviews with workers demonstrate an adequate level of understanding regarding safety and emergency procedures?		

Discussion with the RPO demonstrates an appropriate knowledge of the RPA), the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Is staffing appropriate for the radiation workers to discharge assigned duties safely?		
Comments:		

2. FACILITIES AND EQUIPMENT

Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]

	Yes	**No**
Are the ad-hoc controlled areas and devices as described in the authorization application?		
Are adequate controls in place to prevent unauthorized persons from entering those controlled areas?		
Are adequate controls in place to ensure that all gauges are secured from unauthorized removal from either the operator's premises or from a field site or other temporary transport or storage location?		
The design and performance characteristics of the gauges comply with relevant IEC/ISO standards or other requirements of the RPA?		
Gauges are subject to regular testing to ensure continued compliance?		
If so, at what frequency; by whom; date of last test?		

Gauges are subject to routine maintenance by authorized service agents?		
If so, at what frequency, by whom; date last maintenance		
Records of compliance tests, maintenance, inspection and service maintained?		
Comments:		

RADIATION SOURCES

3.	**Yes**	**No**
Radionuclides, chemical form, activities and uses as authorized in the authorization, i.e. inventory confirmed?		
Leakage tests periodically performed on sealed sources by an approved method?		
Records of leakage tests and inventory maintained?		
Comments:		

4. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

Radiological surveys; leak tests; inventories; handling of radioactive materials; records; contamination control [BSS - Section I.38]

	Yes	**No**
Operator possesses appropriate (particularly in case of neutron detection), functioning survey instrument(s)?		

Suitable function checks are performed on instruments prior to use?		
Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Sufficient functional survey meters are available for each field operation?		
Area exposure rate surveys are performed at appropriate intervals?		
Surveys for removable contamination conducted as required?		
Is it evident that workers always use a survey meter at the conclusion of every exposure to confirm that the radioactive source has returned to its container?		
Records of calibrations, contamination surveys, etc. maintained?		
Comments:		

5. PERSONNEL RADIATION MONITORING

Radiation protection programme with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers]. [BSS – Schedule II]

	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		
Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the RPO?		

Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Personnel monitoring records are maintained?		
Inspector reviewed personnel monitoring records for the period from/to		
Comments *(include the maximum doses to workers during this review period*)		

6. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Materials Safety Standard Series No. TS-R-1]

	Yes	**No**
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labeled and marked?		
Operator's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
For gauges transported by the operator's workers e.g. during field operations		
- are vehicles properly labeled?		
- are gauges properly secured for transport?		

- if also used for storage, are the vehicles and gauges secure from theft?		
Comments		

7. INDEPENDENT AND CONFIRMATORY MEASUREMENTS	**Yes**	**No**
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

APPENDIX 2G

INSPECTION FORM FOR WELL LOGGING

FORM SG 2G-WL-1

THE RADIATION PROTECTION AUTHORITY

INSPECTION PROCEDURES AND RECORDS OF RADIATION SOURCES IN WELL LOGGING

INSPECTION RECORD SUMMARY

WELL (BOREHOLE) LOGGING

Inspection number	
Authorization number	

Name of the Operator	
Address of Operator's Main Office	
Address (location of the site inspected)	
Telephone Number	
Name of Radiation Protection Officer	
Licensee's representative for the inspection	

Date of LAST Inspection	_____/_____/_____
Date of THIS Inspection	_____/_____/_____
Starting time:	**Exit time:**
Type of Inspection Pre-authorization Routine Investigational Termination	☐ ☐ ☐ ☐
Recommended Date of NEXT Inspection	_____/_____/_____
Summary of Findings and Actions NO items of non-compliance found Items of non-compliance found Follow-up on previous non-compliance	☐ ☐ ☐
RPA Inspector name & signature Date	
Supervisor's signature	

FORM SG 2G-WL-2

INSPECTION RECORD

WELL (BOREHOLE) LOGGING

This inspection record/checklist is to be used by the inspector to assist with the performance of the inspection. Note that all areas will not necessarily be applicable to each authorized

*facility. In addition, with supervisory approval, the inspector may choose not to review a particular program area during each inspection. However, for those areas **not examined** or **not relevant** during the inspection a notation such as "Not Reviewed" or "Not Applicable" should be made in the relevant section and a brief explanation as to why the area was not reviewed should be provided, where applicable.*

All areas investigated during the inspection should be documented in sufficient detail to describe the activities and procedures observed and/or demonstrated. In addition, the types of records that were reviewed and the time periods covered by those records should be noted. If the operator demonstrates any work practices at the inspector's request, describe those demonstrations. The observations and demonstrations described in this report, along with measurements and the records reviewed, should substantiate your inspection findings. Attach copies of all relevant documents and records required to support item(s) of noncompliance.

1. AMENDMENTS AND PROGRAM CHANGES

Prior to the inspection, list for review any authorization certificate amendments submitted by the operator and approved by the RPA since the last inspection

2. INSPECTION AND ENFORCEMENT HISTORY

Prior to the inspection, list for review any items of non-compliance identified during previous 2-3 inspections

DATE	INSPECTOR	VIOLATIONS

3. INCIDENT/EVENT HISTORY *Prior to the inspection, list for review any incidents or events reported to the RPA since the last inspection*

4. ORGANIZATION AND SCOPE OF THE PROGRAM *Briefly describe the present scope of activities, including types and quantities of use involving authorized sources, frequency of use, staff size, etc. (Note deviations from the authorization certificate)*

5. TRAINING AND INSTRUCTION OF WORKERS *Training and retraining requirements and documentation; interviews and observations of routine work; staff knowledge of all routine activities, and emergency response*		
	Yes	**No**
Occupationally exposed personnel are provided with initial safety training in the hazards associated with both sealed and unsealed radiation sources?		
Refresher radiation safety training is provided periodically?		
Supervision of logging assistants satisfactory?		
Are training records maintained for each worker?		
Do interviews with workers demonstrate an adequate level of understanding regarding safety and emergency procedures?		
Discussion with the RPO demonstrates an appropriate knowledge of the RPA, the authorization certificate, the legislation, conditions, safe working procedures, etc?		
Does the RPO have appropriate resources (time, personnel) and authority (to take independent action to remedy urgent safety issues) to properly perform the role?		
Comments:		

6. INTERNAL AUDITS AND REVIEWS

	Yes	No
Operator reviews the radiation protection programme at appropriate intervals?		
Audits of the facilities, source inventory, working rules and emergency procedures performed at appropriate intervals?		
Operator conducts regular audits of employees working at field sites?		
Audits conducted by		
Frequency		
Records of program reviews and audits maintained?		
Comments		

7. FACILITIES AND EQUIPMENT

Facilities as described; uses; control of access; engineering controls; calibration facilities; shielding [BSS Section 2.34]

	Yes	No
Are field site facilities as described in the authorization application?		
Is access to radioactive material adequately controlled?		

Are radiation sources secured to prevent unauthorized removal?		
Are adequate methods used to prevent unauthorized individuals from entering controlled areas?		
Is there adequate fire protection?		
RPO reviews results of quality control checks and maintains records of checks?		
Comments:		

8. RADIATION SOURCES	**Yes**	**No**
Radionuclides, chemical form, activities and uses as authorized in the authorization certificate, i.e. inventory confirmed?		
Leakage tests performed on sealed sources?		
Inventory of sealed sources conducted?		
Records of leakage tests and inventory maintained?		
Comments:		

9. RECEIPT AND TRANSFER OF RADIATION SOURCES

	Yes	No
Radioactive package opening procedures established and followed?		
Incoming radioactive packages surveyed for damage, dose rates and potential radioactive contamination before opening?		
Satisfactory procedures are in place for the disposal of radiation sources that are no longer required. e.g. disposal only to authorized persons; notification to the RPA, etc.?		
Records of packaging surveys, source receipt and transfer maintained?		

Comments

10. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

Radiological surveys; leak tests; inventories; handling of radioactive materials; records; contamination control [BSS - Section I.38]

	Yes	No
Operator possesses appropriate, functioning survey instrument(s)?		
Suitable function checks are performed on instruments prior to use?		

Survey meter calibrations are current?		
Survey meter calibration is performed by an approved facility?		
Name of facility		
Sufficient functional survey meters are available for each field site operation?		
Area exposure rate surveys are performed at appropriate intervals?		
Surveys for removable contamination conducted as required?		
Is it evident that workers always use a survey meter at the conclusion of every exposure to confirm that the radioactive source has been returned to its container or, for unsealed sources that contamination is within prescribed limits?		
Records of calibrations, contamination surveys, etc. maintained?		
Comments:		

11. PERSONNEL RADIATION MONITORING

Radiation protection programme with ALARA provisions; dosimetry; exposure evaluations; dose and survey records and reports; notifications to workers] [BSS – Schedule II]

	Yes	**No**
Operator provides personal dosimeters to all radiation workers?		
Dosimetry supplier is an authorized provider?		
Name of provider		

Dosimeters provided are appropriate for the radiation type and energy?		
Dosimeters are exchanged at the prescribed period?		
Dosimetry reports are promptly reviewed by the Radiation Protection Officer?		
Is it evident that personal dosimeters are being worn by workers?		
Individual workers are informed of their monitoring results when each monitoring report is received (regardless of the dose measured)?		
Does the operator apply the optimization principle (ALARA) to occupational exposure?		
Potential for exposure of workers to airborne radioactive substances exists?		
Monitoring for airborne radioactivity conducted?		
Bioassay program has been established and is implemented as appropriate?		
Personnel monitoring records (including bioassay results) are maintained?		
Inspector reviewed personnel monitoring records for the period from/to		
Comments *(include the maximum doses to workers during this review period*)		

12. RADIOACTIVE WASTE MANAGEMENT

Disposal or transfer of sources; packaging, control, and tracking procedures; records [BSS - Section III.8]

	Yes	**No**

Decay-in-storage method used?		
Sealed source disposal in accordance with regulatory requirements?		
Unsealed radiation sources disposed of in accordance with regulatory requirements?		
Records maintained?		
Comments:		

13. TRANSPORT OF RADIOACTIVE SOURCES

IAEA Regulations for the Safe Transport of Radioactive Material-Safety Standard Series No.

TS-R-1

	Yes	**No**
Does transport of radioactive material (from supplier, by operator) comply with IAEA transport regulations?		
Approved packages used?		
Packages properly labelled and marked?		
Operator's vehicles, if used for transport, comply with regulations?		
Shipper's declaration papers have correct details and used when shipping sources?		
Comments		

14. NOTIFICATIONS AND REPORTS

Reporting and follow-up of theft; loss; incidents; overexposures; safety-related equipment failures; change in RPO, and radiation dose reports to workers [BSS - Section 3.12]

	Yes	**No**
Have any program changes been implemented that required (but have not received) approval by the RPA?		
Have any notifiable incidents or accidents occurred since the last inspection?		
If yes, have they been reported to the RPA? (*If no, list the incidents or accidents in Comments)*		
Have any significant safety related changes been made to the facilities or radiation devices without approval of the RPA?		
If yes, was a safety assessment performed by a Qualified Expert?		

Comments

15. WARNING SIGNS AND LABELLING *Proper warning signs in use areas and labelling of containers with radioactive material [BSS-Section I.23]*		
	Yes	**No**
Controlled areas at field sites have appropriate barriers and warning signs (in the local language)?		
Containers of radioactive material are properly labelled?		
Notices to workers are displayed as required (in the local language)?		
Comments		

INDEPENDENT AND CONFIRMATORY MEASUREMENTS		
16.	**Yes**	**No**
Inspector made area and other measurements for comparison to operators		
Comments: *Describe the types and results of measurements taken. Identify the instruments used by the inspector (make, model, last calibration).*		

17. ITEMS OF NON-COMPLIANCE AND OTHER SAFETY ISSUES *List any breaches noted during the inspection (what, when, where and who).*

18. PERSONNEL CONTACTED *Identify the personnel contacted during the inspection*