

TRAINEE INDUSTRIAL RADIOGRAPHER PRACTICAL AND OJT TRAINING LOGBOOK

X-RAY RADIOGRAPHY

NAME: <i>(Print full name)</i>	ID:																											
AUTHORITY HOLDER PROVIDING TRAINING:	SPBNDD AFFILIATE NO.:																											
<p>1. The trainee must provide documentation of successful completion of on-the-job training (OJT) with a minimum of 480 hours under the supervision of an approved and authorized industrial radiographer. <i>(Code of Practice X-Ray section 2.4)</i>. The training plan below should to be completed and signed off by the Trainee, Trainer, RPO and Authority Holder.</p> <p>2. The following reference documents are required to facilitate this training:</p> <ul style="list-style-type: none"> Document No: SPBNDD/IRPAP/001, available on SPBNDD website www.professional-body-ndt.org.za) Regulations relating to Group IV Hazardous Substances No. R. 247, 26 Feb 1993. Section 5); Code of Practice for Industrial Radiography (X-Ray Radiography); IAEA Specific Safety Guide No. SSG-11, 2011. Authority Holder's organization local rules. <p>3. All Trainers should complete the table below:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 45%;">Name and Surname</th> <th style="width: 20%;">SPBNDD No</th> <th style="width: 35%;">Specimen Signature</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		Name and Surname	SPBNDD No	Specimen Signature																								
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Activity	# Hours	Date completed	Trainer Signature
1. Induction			
Company induction.			
Introduction to the senior manager designated as having overall responsibility for overseeing radiation safety and verifying that industrial radiography be carried out in accordance with regulatory requirements. <i>(Regulations relating to Group III Control of Electronic Products No. R. R1332, 3 Aug 1973)</i>			
Introduction to the company RPO.			
Explain the Management structure and policies. <i>(Company Quality Management System)</i>			
Explain the assignment of individual responsibilities for radiation safety. <i>(While the primary responsibility for radiation safety lies with the operating organization, radiographers (including trainees and assistants) have a responsibility to work safely and to take all reasonable actions to restrict their own exposure and those of other workers and members of the public)</i>			
Explain the role of the Responsible person			
Explain initial training requirements <i>(Code of Practice, section 5.2)</i>			
Explain periodic training <i>(Code of Practice, section 5.3)</i>			
Explain 3 monthly observations <i>(Code of Practice, section 5.4)</i>			
Explain the Level of competence required for X-ray radiographers			
Explain and demonstrate records of training and observations <i>(Code of Practice, section 5.5)</i>			
Explain the education and training programme including overview of the SPBNDR Radiation safety Programme. <i>(Document No: SPBNDR/IRPAP/001, available on SPBNDR website www.professional-body-ndt.org.za)</i>			
Explain the local rules and supervision. <i>(Specific to Authority Holders organisation)</i>			
Explain the monitoring of workers and the workplace <i>(Code of practice, X-Ray section 7))</i>			
Explain Health surveillance programme. <i>(Code of practice, X-ray section 2 and local rules)</i>			
Explain the System for recording and reporting all relevant information relating to the control of exposures, decisions regarding measures for occupational radiation protection and safety, monitoring of individuals. <i>(Local rules)</i>			
Explain the Emergency preparedness plans. <i>(Specific to Authority Holders organisation)</i>			
Explain the Mechanism for the review and updating of the arrangements. <i>(Specific to Authority Holders organisation)</i>			
Explain the Regulatory compliance inspection and enforcement. <i>(Code of Practice)</i>			
Explain the Human factors and practical applications pertaining to the work environment including the impact of substance abuse, fatigue and stress. <i>(Specific to Authority Holders organisation)</i>			
Actual Hours			
Required Hours	16		

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2. Facilities and Resources. (X-ray)			
Demonstrate the Company facilities.			
Demonstrate the Company resources.			
Demonstrate the use of Collimators.			
Demonstrate the use of Ancillary equipment.			
3. Equipment Specifications and Periodic Testing			
Explain and demonstrate dose equivalent rate from leakage radiation measured at one meter from the focus of the tube head. (Code of Practice, section 3.1)			
Explain and demonstrate the use of lead cap for covering the radiation window during warm up and testing. (Code of Practice, section 3.2 & 3.3)			
Explain and demonstrate the use of diaphragms. (Code of Practice, section 3.4 & 3.5)			
Explain and demonstrate the length of cable required for the various X-ray equipment kV values. (Code of Practice, section 3.6)			
Explain and demonstrate the use of a key to activate the control panel. (Code of Practice, section 3.7)			
Explain the two independent means, that indicate when X-rays are being generated.			
Explain and demonstrate Door interlocks.			
Explain and demonstrate Warning signals and notices.			
Explain and demonstrate Emergency stop buttons or pull-cords.			
Explain door switch connectors on enclosed installations. Door interlocks			
Explain and demonstrate the marking of a tube head. (Code of Practice, section 3.12)			
Explain the guidance documentation (Code of Practice, section 3.13)			
Explain and demonstrate the instruction manual for all X-ray equipment. (This should always be available with the equipment)			
Explain and demonstrate maintenance procedures			
Explain and demonstrate the equipment that may be used and the specific work to be carried out			
Explain and demonstrate the check for Air scattering of radiation (or 'sky shine') and scattering from objects outside enclosures without shielded roof.			
4. Specification for Enclosed Exposure Facilities (Code of Practice, section 4)			
Explain that an enclosed exposure facility is a dedicated system such as those built into a production line. It is not an exposure bay with walls, maze and portable equipment.			
Explain and demonstrate that the control must be placed outside the enclosure.			
Explain that the enclosed exposure facility may not be located in an area zoned for domestic use.			
Explain the facility markings, including warning signs and contact persons.			
Explain and demonstrate the positive indication when an exposure is underway.			
Explain the interlock systems.			

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Explain and demonstrate the device, which makes it possible for a person accidentally left in the enclosure, to open one of the doors easily and leave.			
Explain and demonstrate the locking of additional doors that the operator does not control.			
Explain and demonstrate the maximum dose rate outside the exposure facility. (Preferably not to exceed 2.5 $\mu\text{Sv/h}$ (0.25 mR/h), but must not exceed 7.5 $\mu\text{Sv/h}$ (0.75 mR/h).)			
Explain that enclosed installations must be provided with a sign stating the maximum rating and limitations on the primary beam directions established for that installation.			
5. Handling Procedures (Code of Practice, section 6)			
Explain that industrial radiography may only be performed by having a personal authority from radiation control.			
Explain that a trainee industrial radiographer must only work under the direct supervision of an authorised industrial radiographer. This implies that a qualified radiographer must be physically present at all times during radiography work and that the authorised radiographer assumes full responsibility for the actions of the trainee.			
Explain that an operator may perform work within an enclosed exposure facility without a personal authority.			
6. Radiography in Open Areas			
Explain the need for work permit procedures and demonstrate completion of documentation. (Own Organisation and Client)			
Explain and demonstrate Preparation for site radiography.			
Explain Cooperation with the client.			
Explain and demonstrate the wearing of TLD and use of direct-reading dosimeter and the necessity of being in possession of a functioning radiation monitor.			
Explain and demonstrate necessary equipment for setting up of barriers, as well as radiation warning signs including warning lights for night-work.			
Explain daily checks of equipment, accessories and auxiliary apparatus.			
Explain and demonstrate the use of collimators and/or other appropriate shielding material, including shielding to prevent backscatter.			
Explain and demonstrate the required calculation and erection of barriers. (Instantaneous dose rate shall not exceed 10 $\mu\text{Sv/h}$ {1 mR/h})			
Explain and demonstrate the check of radiation levels at the barrier once the unit has been activated, and if necessary moved.			
Explain and demonstrate that no individual is exposed to radiation in excess of the following levels : Workers not wearing Personal Dosimeters - 20 μSv (2 mrem) in any one day. Members of the Public - 4 μSv (0.4 mrem) in any one day. (Code of Practice, section 6.2.5).			
Explain and demonstrate warning signs and, at night, warning lights are prominently displayed. (Code of Practice, section 6.2.6)			
Explain removing people from the demarcated area before commencing the exposure.			
Explain close liaison between operators of adjacent sites that overlap.			

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Explain attendance near demarcated area, in order to take immediate corrective measures should any unplanned entry into the area take place.			
Explain that during start-up preparation or testing of x-ray tubes, a lead cap designed for this purpose must close the radiation window.			
Explain that the warning lamp connected to the control panel be prominently positioned near the x-ray tube.			
7. Radiography in Enclosed Exposure Facility			
Explain that this is an exposure bay with walls, maze and portable equipment.			
Explain before commencing an exposure that nobody is allowed in the enclosure.			
Explain that exposure must be terminated according to the correct termination procedures and the use of safety devices such as interlocks for exposure termination is not permitted.			
Explain that entry into the enclosure is not permitted prior to termination of the exposure.			
Explain rendering the unit inoperable by locking the control panel and removing the key when the facility is not in use.			
Explain compliance with all limitations on the use of enclosed installations.			
Explain that TLD must be worn by persons using enclosed facilities of this nature.			
Demonstrate the availability of written operating procedures and emergency procedures.			
Explain Procedures for radiographing unusually long items that do not fit behind closed doors.			
8. Radiation Monitoring Requirements			
Explain that no radiation worker may perform industrial radiography without a TLD issued in his/her name. (Members of a radiography team must not be issued with BLANK TLD's)			
Explain that all members of industrial teams, as well as any other workers who are likely to receive more than 200 μ Sv during any one day must be issued with a direct-reading dosimeter or a digital audible-alarm dosimeter, with a full-scale deflection of at least 2 mSv (200 mR)			
Explain that daily doses must be accurately recorded, and such records be kept for at least 5 years.			
Explain that these dosimeters must be checked for correct response at periods not exceeding 26 months.			
Explain that dosimeters must be worn at all times during the course of their work.			
Explain that a radiographic team performing radiography in an open area must use a radiation monitor (dose-rate meter) with a range sufficient to measure 10 μ Sv/h (1R/h) and that it requires calibration every 7 months.			
Explain that work must not be carried out unless dosimeters and monitors are in proper working order.			
9. Dose Limitations			
Explain that radiation doses to individuals must at all times be kept as low as is reasonable achievable (ALARA).			
Explain that radiation doses to individuals (including themselves) do not exceed the limits specified. (Code of Practice, section 8.2)			
Explain the information regarding medical examinations and blood tests.			

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Explain notification to Radiation Control of any person being over exposed or suspected overexposure.			
10. Emergency Procedures			
Explain emergency plans			
Explain Types of emergency as identified and included in organisations assessment reports.			
Explain regular audits			
Explain the immediate action to be taken in order to prevent excessive radiation doses.			
Explain the internal and external notification procedures.			
Explain and demonstrate the procedures for dealing with the incident and returning the situation to normal.			
Explain if a direct-reading or digital audible dosimeter is found to be off-scale, the exposure must be terminated immediately and the occurrence must be treated as a suspected overexposure.			
Explain training exercises			
11. Practical Training <i>The Trainee is to physically perform the following as relevant</i>			
Prior to operations			
Use a direct reading dosimeter, audible dosimeter, personal dosimeter (TLD) issued by licensed dosimetry service, and radiation survey meter. <i>(Code of Practice, section 7)</i>			
Turn on alarming dosimeter and survey meter before starting exposure and ensure that the dosimeters and monitors are in place, and in proper working order.			
Check power level of batteries.			
Check equipment for valid calibration dates.			
Zero DRD prior to use and ensure a minimum of 2 mSv (200 mR) total dose range			
Continuity/Function check for radiation detection equipment			
Use all required daily records required by Authority Holder			
Perform a job hazard assessment of work area			
Procedure to quarantined broken or deficient equipment			
Post sufficient # of signs and barriers to prevent entry into area			
Evacuate persons from the controlled area			
Place equipment safely to prevent any incidents			
Radiography in Open Areas			
Perform equipment checks prior to operation			
Collimator and/or effective use of shielding			
During operations			
Verify barrier dose rates and radiation warning sign positions on first exposure using the survey meter.			

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Operational procedures are followed.			
Use of the correct length extension cable for remote exposure control. <i>(Code of Practice, section 3.6)</i>			
<ul style="list-style-type: none"> At least 10 meters for kv's below 200 At least 20 meters for Kv's exceeding 200kV. 			
Implementation of ALARA and basic radiation protection principles			
Post Exposure			
Disassemble the equipment in the correct order according to the manufacturer's specifications			
Removal of posted radiation warning signs and barriers			
Sign exposure device back in to secure storage area as necessary.			
Record Keeping			
Accurately record daily doses measured by direct-reading dosimeter.			
Survey reading on surface of device			
Documenting equipment checks required by Authority Holder			
DRD readings			
Trainee supervisor consent form			
Emergency Preparedness			
Recognize an emergency situation			
Location of required emergency equipment			
Location of emergency procedures			
Initial emergency steps in an emergency			
Correct contact information			
Transportation			
Placing the equipment correctly within the vehicle for transport.			
Security			
Controlling the device throughout operations			
Explain and demonstrate storage of equipment			
	Actual Hours		
	Required Hours	40	
Remarks:			



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12. Practical On the Job Work (*Under direct supervision*) Briefly describe the work and location.



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