



National Offender
Management Service

**NOMS Health and Safety Arrangements for Radiation Safety of X Ray Security
Equipment**

This instruction applies to:-		Reference:-
Prisons NOMS HQ		PSI 18/2015 AI 13/2015
Issue Date	Effective Date	Expiry Date
07 July 2015	07 July 2015	31 March 2018
Issued on the authority of	NOMS Agency Board	
For action by	All staff responsible for the development and publication of policy and instructions <input checked="" type="checkbox"/> NOMS HQ <input checked="" type="checkbox"/> Public Sector Prisons <input type="checkbox"/> Contracted Prisons* <input checked="" type="checkbox"/> NOMS Immigration Removal Centres (IRCs) <input checked="" type="checkbox"/> Governors <input type="checkbox"/> Heads of Groups <i>* If this box is marked, then in this document the term Governor also applies to Directors of Contracted Prisons</i>	
Instruction type	Health and Safety Risk Reduction and Legal compliance	
For information	All staff in NOMS HQ Prison establishments	
Provide a summary of the policy aim and the reason for its development/ revision	The purpose of this PSI is to ensure that Governing Governors and Heads of Groups have in place systems and protocols to protect staff, visitors, prisoners, contractors and others from the harmful effects of ionising radiation from security x-ray equipment and to comply with the specific legal requirements around same.	
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Associated documents	PSI 06/2015 Policy Organisation and Summary Arrangements for the Management of Health and Safety	
Replaces the following documents which are hereby cancelled: PSO 3843 - <i>All hard copies of these Instructions must be destroyed</i>		
Introduces amendments to the following documents: None		
Audit/monitoring: Compliance with this instruction will be monitored at three levels: a) Locally via quarterly regular report to establishment SMTs and health and safety committees via the NORCET HSF monitoring tool. b) Regionally via establishment assurance visits from regional HSF teams with summary reports to DDCs. c) Nationally via NORCET summary to NEMC's HSF Sub-committee and IAA 3 yearly G+O Audits.		
Notes: <i>All Mandatory Actions throughout this instruction are in italics and must be strictly adhered to.</i>		

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1. Executive Summary

Background

- 1.1 The purpose of this PSI is to ensure that Governing Governors and Heads of Groups have in place systems and protocols to protect staff, visitors, prisoners, contractors and others from the harmful effects of ionising radiation from security x-ray equipment and to comply with the requirements of the Ionising Radiation Regulations 1999.
- 1.2 It replaces PSO 3843 and includes minor amendments and additions to previous requirements as follows:
- Clarifies that the role of the Radiation Protection Supervisor (RPS).
 - Makes the inspection and test cycle for security x-ray equipment subject to a risk assessment on the advice of NOMS' Radiation Protection Advisor (RPA)
 - Includes the expectation that security X-Ray equipment will be included within NOMS' formal planned preventative maintenance systems i.e. Planet FM
 - Requires that a local protocol is drawn up covering the management of both NOMS-owned legacy medical and dental x-ray and healthcare owned medical and dental x-ray equipment

Desired outcomes

- Safe systems for the use of security x-ray equipment;
- The protection of staff and others from the harmful effects of ionising radiation;
- Compliance with relevant ionising radiation legislation.

Application

- 1.3 This instruction applies to all NOMS sites at which X ray equipment is used. Governing Governors and those managing such sites should be familiar with the key duties summarised by mandatory actions at 1.4. Estates Management functions should be familiar with sections 8, 9, 10 and 11. Health and Safety Advisors and those managing X ray equipment and operations should be familiar with the whole content of the document.

Mandatory Actions

- 1.4 *Where security x-ray equipment is used Governing Governors and Heads of Groups must ensure:*
- *Adequate consultation with NOMS' Radiation Protection Advisor (RPA);*
 - *Implementation of the advice of the RPA*
 - *Carry out an assessment of the risks from ionising radiation equipment in line with RPA advice*
 - *Notify any ionising radiation equipment to the local Health and Safety Executive (HSE) office;*
 - *Issue and maintain local rules for the safe use of ionising radiation equipment;*
 - *Designate controlled and supervised areas where appropriate;*
 - *Appoint and ensure the adequate training Radiation Protection Supervisor(s) (RPSs);*
 - *Ensure that staff who operate x-ray equipment are adequately trained;*
 - *Arrange for radiation dose rate measurements to be carried out if advised by the RPA*
 - *Ensure that appropriate service contracts are in place for the equipment and that adequate maintenance records are maintained via Planet FM.*

- *Ensure adequate monitoring of the standard of x ray operations*

Resource Impact

1.5 There are no new resource implications associated with this update.

(Approved for Publication)

Carol Carpenter
Director of Human Resources, NOMS

RADIATION SAFETY- SECURITY X-RAY EQUIPMENT

2. Introduction

2.1 The Ionising Radiation Regulations 1999 apply whenever ionising radiation is used in the workplace. The Regulations require employers to establish a framework for ensuring that exposure, or potential exposure, to ionising radiation resulting from work activities is kept as low as is reasonably practicable so as protect staff and others from the effects of ionising radiation. In particular the Regulations require employers to:

- Consult a Radiation Protection Advisor (RPA);
- Carry out an assessment of the risks from ionising radiation equipment;
- Notify any ionising radiation equipment to the local Health and Safety Executive (HSE) office;
- Issue local rules for the safe use of ionising radiation equipment;
- Designate controlled and supervised areas where appropriate;
- Appoint and adequately train Radiation Protection Supervisors (RPSs);
- Ensure that staff who operate x-ray equipment are adequately trained;
- Arrange for radiation dose rate measurements to be carried out.

2.2 The Regulations also apply where any work is carried out in an atmosphere containing radon 222 gas at a concentration in air, averaged over any 24 hour period exceeds 400 Bq m⁻³. The management of Radon risk is covered in a separate instruction.

2.3 *This PSI sets out the actions that Governing Governors and Heads of Groups must take to ensure that:*

- *Radiation doses to staff, inmates and other persons from security x-ray equipment are kept as low as reasonably practicable, and*
- *Relevant statutory requirements are complied with.*

3. Security X-ray Equipment

3.1 Security x-ray equipment will include:

- x-ray inspection units (both conveyor and cabinet);
- portable (“flash”) x-ray sets;
- Explosives/narcotics detectors incorporating the radioactive substance, nickel-63.

3.2 This list is not exhaustive and the advice set out in this instruction will apply to all non-medical ionising radiation equipment.

4. Radiation Protection Adviser (RPA)

4.1 *Where ionising radiation is used the employer must consult an RPA to advise him/her on the measures that must be taken to ensure compliance with the Ionising Radiation Regulations 1999.*

4.2 The Prison Service has appointed a Radiation Protection Advisor under contract. The current incumbent is Integrated Radiation Services Ltd. The RPA is responsible for:

- Providing the NOMS with general advice on radiation protection for staff and others who may be affected, including advice on compliance with relevant statutory requirements and new developments in radiation safety;
- Giving specific advice on radiation protection of staff and others to each prison where security x-ray equipment is used;
- *Advising on the completion of the assessments of the risks to staff from ionising radiation and on the control measures that must be implemented to eliminate or reduce the risk;*
- Visiting each prison where security x-ray equipment is used at a frequency determined by the RPA as appropriate for type and use of equipment. These visits will include an inspection and survey of x-ray security equipment and reviews of radiation safety;
- Compiling a report following each visit identifying any problems, the remedial work that needs to be done to rectify any identified problems and a time scale for completing the work;
- Providing information and insets for the RPA Operational File for each establishment;
- Undertaking of commissioning inspections of new equipment. Giving advice when requested on new equipment and facilities;
- Providing advice on remedial action and undertaking investigations and dose assessments as appropriate, in the event of any accident or potential exposure involving radiation of staff or others;
- Providing the Prison Service with regular reports describing the work carried out within the scope of the RPA contract and identifying any trends or concerns.

5. Risk Assessment

Carrying out Risk Assessments

- 5.1 *An assessment of the risks to staff and others from x ray equipment must be carried out before any new activity involving work with ionising radiation is undertaken. The purpose of this assessment is specifically to identify the measures required to restrict exposure during normal operations and in the event of an accident. In particular all hazards with the potential to cause a radiation accident must be identified and measures must be implemented to prevent any such accident or limit the consequence should such an accident occur.*
- 5.2 The RPA will assist in the completion of risk assessments of security x-ray equipment. These risk assessments are generic to the type of equipment in question. However it is the responsibility of the Governor to ensure that all specific hazards and conditions are considered when assessing the risks. Risk assessments are documented in the RPA Operational File.
- 5.3 *Governors must ensure that a risk assessment of all security x-ray equipment is completed and any identified control measures are implemented.*

Remedial Action

- 5.4 *Governing Governors and Heads of Group must ensure that any remedial action required either as a result of the risk assessment or annual checks by the RPA is carried out in accordance with the timescales set out by the RPA.*

Review of Risk Assessments

- 5.5 *Risk assessments must be reviewed when there are any changes in the equipment or the circumstances in which it is used. The RPA must be informed of any such changes so that risk assessments can be reviewed and revised if necessary. Regular inspections by the RPA will form part of the review process.*

6. Notification of Specified Work

- 6.1 *The HSE must be notified of work involving ionising radiation twenty-eight days before any such work begins. Notification must be made to the local HSE office.*
- 6.2 The Governing Governor or Head of Group is responsible for ensuring that the HSE is informed of work involving ionising radiation. They can seek assistance and advice via Regional HS Leads
- 6.3 The information that is required by the HSE is given at [Annex A](#).

7. Radiation Protection Supervisors

- 7.1 *Where security x-ray equipment is in use Governing Governors and Heads of Groups must appoint a Radiation Protection Supervisor (RPS). Where there is more than one RPS, one of the appointees must be designated as the principal RPS, with the others being considered to have the role of deputy.* The purpose of the RPS is to ensure that the radiation operation is controlled in line with the local rules. Governors should generally therefore appoint someone with supervisory authority over the area in which the radiation equipment is used. The automatic assumption that an HS specialist has to be the RPS is incorrect.
- 7.2 *Where medical or dental x-ray equipment and security x-ray equipment are present in a prison an RPS must be appointed for each area. Where the equipment is owned by the healthcare provider they will provide the RPS and the establishment must merely monitor that equipment and local rules are maintained. Where legacy medical x-ray equipment remains in the legacy ownership of NOMS, a local agreement as to its management must be made.* It is likely in the latter circumstances that NOMS will remain the radiation employer for the provision of the RPA services but that healthcare staff should take on the RPS role as they will be proximate to the operation of the equipment.
- 7.3 *The RPS must have sufficient line management authority and time to undertake the relevant duties.*
- 7.4 *The RPS must be adequately trained to carry out this role as soon as possible following his/her appointment.* Training for Security RPSs is a one-day course and is available through Newbold Revel.
- 7.5 *RPSs must receive refresher training every five years.*
- 7.6 RPSs are responsible for:
- Ensuring that adequate Local Rules are available and are being complied with;
 - Making arrangements for the appropriate operational training of all staff who work with the equipment;
 - Ensuring that adequate arrangements have been made for the supervision of contractors, visitors and other persons who may come into contact with the x-ray equipment;
 - Ensuring that the daily checks on the correct operation of the safety features (warning lights, emergency stop buttons) are carried out and the findings recorded;
 - Ensuring the satisfactory operation of suitable maintenance contracts for all security x-ray equipment;
 - Notifying the RPA of the impending purchase of any new security equipment which may emit ionising radiation or/and incorporate radioactive material;
 - Being the principal point of contact for liaison with the RPA;
 - Maintaining the RPA Operational file;
 - Ensuring that remedial action required as the result of an RPA inspection is completed and recorded.

8. Maintenance of equipment

- 8.1 *Governing Governors and Heads of Groups must ensure that all security x-ray equipment is fit for the purpose for which it was purchased and is properly maintained.*
- 8.2 *Security x-ray equipment must be recorded on the Planet FM planned maintenance system and inspection, test and maintenance work recorded on same, irrespective of whether undertaken by direct or contracted services.*
- 8.3 *The RPA is not responsible for the maintenance of x-ray equipment and Governors must ensure that a contract for maintaining this equipment is in place with a suitable supplier.*

9. Purchase/replacement of equipment

- 9.1 *Governing Governors and Heads of Groups must inform the RPA of the impending purchase of any new or replacement security x-ray equipment and must ensure that there is adequate co-operation and communication with the equipment supplier.*

10. Critical examination

- 10.1 Regulation 31(2) of the IRR 1999 requires equipment installers to undertake a “critical examination” of the way in which new equipment is installed for the purpose of ensuring, in particular, that:
- The safety features and warning systems operate correctly;
 - The equipment provides sufficient protection for all persons against exposure to Radiation.
- 10.2 This applies to new equipment, to equipment that is transferred from another location (including within the same establishment), and following replacement of any component that directly affects radiation exposure.
- 10.3 *The installer must be asked to provide a written report of the critical examination, which must include the minimum information specified in [Annex A](#).*
- 10.4 Generally, the requirement for a Critical Examination only applies in respect of x-ray inspection units, which are “installed” on the premises.
- 10.5 *The installer will generally be a representative of the supplier. Prison Service personnel must not undertake this work.*
- 10.6 *When new x-ray equipment is installed or existing equipment is moved to a new location Governing Governors and Heads of Groups must ensure that a critical examination is carried out by the installer before the equipment goes into use.*

11. Checks of Security X-ray Equipment by the RPA

- 11.1 Radiation dose rate measurements and checks on the safety and warning systems (including statutory checks for leakage of radioactive material where appropriate) will be carried out by the RPA during their regular visits to determine whether or not:
- The equipment continues to meet relevant standards,
 - Operation of the equipment can be achieved whilst restricting doses to staff and other persons as far as is reasonably practicable.
- 11.2 A report of the measurements and checks undertaken will be included in the visit report, which will include any recommendations for remedial action where this is required.

12. Local Rules (Procedures)

- 12.1 *Work with ionising radiation must be carried out in accordance with written safety procedures, referred to as Local Rules.*
- 12.2 Local rules are a set of instructions laying down how the work should be carried out so as to restrict exposure to radiation (and ensure compliance with relevant legislation).
- 12.3 The RPA will provide local rules based on a standard template. It is the responsibility of the Governing Governor to ensure that local rules adequately reflect local conditions.
- 12.4 Local rules should include:
- Details of the RPS(s);
 - Description of any designated areas (see section 12 below);
 - General operational procedures (which are pertinent to radiation safety);
 - Actions to be taken in the event of a radiation accident;
 - Dose investigation level.
- 12.5 *The RPS must ensure that adequate local rules are available and are being complied with by all staff and others who may come into contact with the x-ray equipment.*

13. Designated Areas

- 13.1 In certain circumstances an area where x-ray equipment is used may be designated as a controlled or supervised area.
- 13.2 A controlled area is designated if the risk assessment has shown that it is necessary to follow special procedures to restrict exposures or to limit the possibility of an accident.
- 13.3 Supervised areas are designated on the basis that it would be prudent to keep conditions under review.
- 13.4 The RPA will advise on the need to designate areas. These will be identified in the local rules.
- 13.5 *The RPS must ensure that any additional measures required when an area is designated are in place and enforced.*

14. Dose assessment

- 14.1 Risk assessments of security x-ray equipment used in the Prison Service, except for flash x-ray equipment (see below) indicate that the work is not likely to result in significant radiation doses to operators or other personnel. It is not necessary, therefore to designate any staff as "classified" radiation workers, and it is not considered necessary to issue operators with personal radiation dosimeters.
- 14.2 Due to the low risk from security x-ray equipment it is not necessary to place restrictions on female employees who are, or may become, pregnant. Though any concerns they raise should be addressed considerately.
- 14.3 *Due to the slightly higher potential for exposure to radiation, staff using portable flash x-ray equipment must be issued with personal dosimeters for wear during periods of equipment use (on advice from the RPA).*
- 14.4 *Dosimeters must be appropriate for the type of radiation in use and advice should be sought from the RPA.* Usually, passive, TLD dosimeters should be used when using portable flash x-ray equipment.
- 14.5 TLD dosimeters are available on advice from NOMS' contracted RPA.
- 14.6 Used dosimeters should be returned in line with the RPA's advice.
- 14.7 The RPS is responsible for ensuring that dosimeters are worn when this work is carried out, returning the dosimeters for assessment and keeping records of the name of the member of staff who wore the dosimeter, the period of wear and the results.
- 14.8 The results should be compared with the dose investigation level. If results indicate that any individual has received a dose above this level in a calendar year the RPA should be informed and an investigation into the circumstances carried out.
- 14.9 *The report of any such investigation must be retained on the RPA file for at least two years.*

15. Adverse Incidents

- 15.1 *The event of any incident involving x-ray equipment the contingency plans given in the local rules must be followed.*
- 15.2 If any x-ray equipment or associated safety or warning systems are faulty they should be repaired immediately. *Unless the fault is of a minor nature (e.g. light bulb or trefoil warning label) the unit must be taken out of use until repaired.*
- 15.3 If it is suspected that any person (employee or other) may have received a radiation dose above the dose investigation level the RPA should be contacted for further advice. The RPA will decide whether further investigation is required.

16. RPA Operational File

16.1 The RPA, with the co-operation of the RPS, will compile and update the RPA Operational File. One copy will be held by the RPA and another held and maintained by the RPS. The file will include:

- A description of each item of equipment and its location;
- Names, addresses and contact numbers for all persons having a radiation protection role in the use of security x-ray equipment;
- The training schedule for all persons involved in the work with the equipment;
- Risk assessments;
- A description of designated (controlled or supervised) areas;
- The local rules for radiation safety, including contingency plans;
- Copies of the RPA's reports and any other relevant correspondence;
- Results of the checks on the safety and warning system/s or reference to where the results of these checks can be found;
- Results of critical examination and service reports provided by the service engineer.

NOTIFICATION OF IONISING RADIATION EQUIPMENT TO THE HSE

The following particulars on ionising radiation must be provided to the HSE:

- a) *The name and address of employer and a contact telephone number or fax number or electronic mail address;*
- b) *The address of the premises where or from where the work activity is to be carried out and a telephone number or fax number or electronic mail address at such premises;*
- c) *The nature of business of the employer;*
- d) *Into which of the following categories the source or sources of ionising radiation falls*
 - 1. *sealed source;*
 - 2. *unsealed radioactive substance;*
 - 3. *electrical equipment;*
 - 4. *an atmosphere containing the short –lived daughters of radon 222;*
- e) *whether or not any source is to be used at premises other than the address given at (b) above; and*
- f) *dates of notification and commencement of the work activity.*

Additional particulars that the HSE may require

The following additional particulars may also be required by the HSE:

- a) a description of the work with ionising radiation;
- b) particulars of the source or sources of ionising radiation including the type of electrical equipment used or operated and the nature of any radioactive substance;
- c) the quantities of any radioactive substance used in the work;
- d) the identity of any person engaged in the work;
- e) the date of commencement and the duration of any period over which the work is carried on;
- f) the location and description of any premises at which the work is carried out on each occasion that it is so carried out;
- g) the date of termination of the work;

ANNEX B

CRITICAL EXAMINATIONS OF X-RAY SECURITY EQUIPMENT

Installers undertaking a critical examination in respect of the installation of new x-ray inspection equipment, or relocation of existing equipment should be asked to provide a written report of the examination. As a minimum this should include the following:

- Full details of the equipment in question: make, model, serial number and year of manufacture;
- Full details of the manufacturer, supplier, installer;
- Name(s) of the person(s) undertaking the critical examination;
- Name of the Radiation Protection Adviser (RPA) for the installer;
- Signed confirmation that:
 - a) A Critical Examination has been carried out in accordance with Regulation 31(2) of IRR99
 - b) The results of the examination are satisfactory, in that
 - I. dose-rates around all exterior surfaces, including surfaces of input and exit tunnels on conveyor units, the plane of the open end of these tunnels and the outer surfaces of any lead/plastic curtains should be less than 1.0 μ Sv/h (both with and without a package in the x-ray beam);
 - II. all warning lights are observed to function correctly;
 - III. all safety mechanisms operate in accordance with the equipment specification;
 - IV. all warning notices are in place, legible and unambiguously worded.