1962. No. 123

As this Order has been classified as local it is not printed at length in this volume. A summary is given in the List of Statutory Rules and Orders of a Local Character under the heading URBAN DRAINAGE.

1962. No. 124 [C]

FACTORIES

Ionising Radiations (Sealed Sources)

REGULATIONS, DATED 5TH JULY, 1962, MADE BY THE MINISTRY OF LABOUR AND NATIONAL INSURANCE UNDER THE FACTORIES ACTS (NORTHERN IRELAND), 1938 TO 1959.

The Ministry of Labour and National Insurance for Northern Ireland in exercise of powers conferred by section 65 of the Factories Act (Northern Ireland), 1938(**a**), section 8 of the Factories Act (Northern Ireland), 1949(**b**), section 28 of the Factories Act (Northern Ireland), 1959(**c**), and of all other powers in that behalf, hereby makes the following special Regulations:—

PART I

INTERPRETATION AND GENERAL

Citation and commencement

1. These Regulations may be cited as the Ionising Radiations (Sealed Sources) Regulations (Northern Ireland), 1962. Regulations 1 to 6 shall come into operation at the expiration of fourteen days, and the remainder of these Regulations at the expiration of six months, from the making of these Regulations.

Interpretation

2. For the purposes of these Regulations, unless the context otherwise requires, the following expressions have the meanings hereby assigned to them respectively, that is to say—

"adequate shielding" in relation to any source of ionising radiations means having provided and properly maintained around that source of ionising radiations shielding or a demarcating barrier being shielding or a barrier outside which the radiation dose rate averaged over any one minute does not exceed 0·75 millirads in air per hour or where only classified workers are affected 2·5 millirads in air per hour, and cognate expressions shall be construed accordingly;

"appointed doctor" as respects any factory means—

(*a*) any fully registered medical practitioner who is approved and is

(a) 2 Geo. 6. c. 23 (N.I.).
(b) 1949. c. 6.
(c) 1959. c. 16.

acting within the terms of his approval or (where there is no such practitioner) the appointed factory doctor for the district; or

(*b*) if the prospective employer so requests in the case of an examination in pursuance of Regulation 25(1), the appointed factory doctor for the district in which the person undergoing the examination resides;

"approved" means approved for the time being for the purposes of these Regulations by certificate of the chief inspector;

"authorised person" in any of these Regulations means a person for the time being authorised in writing by the occupier for the purposes of that Regulation;

"calendar quarter" means the period of three calendar months beginning with the first day of January, the first day of April, the first day of July or the first day of October;

"classified worker" has the meaning assigned to it in paragraph (1) of Regulation 11;

"factory" includes any place to which these Regulations apply;

"health register" means the register referred to in Regulation 30;

"ionising radiations" means electromagnetic radiation (that is to say, X- or gamma ray photons or X- or gamma ray quanta) or corpuscular radiation (that is to say, alpha particles, beta particles, electrons, positrons, protons, neutrons or heavy particles) being electromagnetic radiation or corpuscular radiation capable of producing ions and emitted from a radioactive substance or from a machine or apparatus that is intended to produce ionising radiations, or from a machine or apparatus in which charged particles are accelerated by a voltage of not less than five kilovolts;

"the principal Act" means the Factories Act (Northern Ireland), 1938;

"protected employment" means employment as respects which requirements are for the time being imposed under the principal Act (including the requirements of these Regulations) for recording the radiation doses received by the persons employed;

"radiation dose record" means the record referred to in paragraph (1) of Regulation 24;

"radioactive substance" means any substance which consists of or contains any radioactive chemical element whether natural or artificial and whose specific activity exceeds 0·002 of a microcurie of parent radioactive chemical element per gramme of substance;

"sealed source" means any radioactive substance sealed in a container (otherwise than solely for the purpose of storage, transport or disposal) or bonded wholly within material and includes the immediate container or the bonding;

"transfer record" means a record prepared on the termination of any person's employment of radiation doses received by him being a record prepared in accordance with requirements for the time being imposed under the principal Act (including the requirements of these Regulations);

"useful beam" means, in the case of X-rays, that part of the radiation from an X-ray tube that passes through the aperture, cone or other device for collimating the X-ray beam; and, in other cases, any ionising radiations from a sealed source that can be employed for the purposes for which the sealed source is used.

Application of Regulations

3.—(1) Subject to paragraphs (4) and (5) of this Regulation, these Regulations shall apply to—

(*a*) all factories; and

(*b*) all premises, places, processes, operations and works to which the provisions of Part IV of the principal Act with respect to special regulations for safety and health are applied by sections 107 to 112 of that Act,

in which any sealed source is, or is proposed to be, stored, manipulated, maintained, operated, used or installed, or in which there is operated or used, or proposed to be operated or used, any machine or apparatus that is intended to produce ionising radiations or any machine or apparatus (being a machine or apparatus which emits ionising radiations) in which charged particles are accelerated by a voltage of not less than five kilovolts.

(2) Where in any factory the occupier is neither the owner nor the hirer of a sealed source or of such a machine or apparatus as is referred to in paragraph (1) of this Regulation being a sealed source, machine or apparatus which is used by or under the direction of some person other than the occupier or a person in the employment of the occupier, that other person or (if he is in the employment of the owner or hirer) the employer of that other person, shall in relation to that sealed source, machine or apparatus be deemed to be the occupier of the factory for the purposes of these Regulations.

(3) Where in any factory some person other than the occupier is the employer of any classified worker, that other person shall, in relation to that classified worker, be deemed to be the occupier of the factory for the purposes of Part III of these Regulations.

(4) Nothing in these Regulations shall apply with respect to any X-ray apparatus exclusively used in a room specially set apart for the purpose, for the prevention, diagnosis or treatment of illness or injury.

(5) Except as provided in paragraph (6) of this Regulation, nothing in these Regulations shall apply with respect to—

(*a*) any sealed source at or near the surface of which the dose rate of ionising radiations does not exceed ten millirads in air per hour not being one of a number of sealed sources placed together and whose collective dose rate at or near the surface exceeds ten millirads in air per hour; or

(*b*) any ionising radiations that do not arise from a sealed source or from such a machine or apparatus as is referred to in paragraph (1) of this Regulation; or

(*c*) any nuclear fuel element; or

(*d*) any plant or installation of the kind specified in paragraph (*a*) or paragraph (*b*) of sub-section (1) of section one of the Nuclear Installations (Licensing and Insurance) Act, 1959(a), being plant or installation containing any radioactive substance; or

(*e*) any apparatus used only for the purpose of receiving visual images sent by television when operated at a voltage of not more than twenty kilovolts.

(a) 7 & 8 Eliz. 2. c. 46.

In sub-paragraph (*a*) of this paragraph the expression "at or near the surface" means as near the surface as is practicable for the purpose of measuring the dose rate of ionising radiations.

(6) Notwithstanding the provisions of paragraph (5) of this Regulation, where in any factory to which these Regulations apply ionising radiations arise from all or any one or more of the sources referred to in that paragraph, such ionising radiations shall, to the extent to which they are ionising radiations to which the following provisions of these Regulations or either of them respectively relate, be taken into account for the purposes of the said provisions, namely—

(*a*) paragraph (3) of Regulation 26 (which relates to the ionising radiations recorded by the photographic films worn by classified workers); and

(*b*) paragraph 1 of the Schedule (which specifies the ionising radiations that have to be taken into account for the purpose of the maximum permissible radiation doses).

(7) The provisions of these Regulations shall be in addition to and not in substitution for or in diminution of other requirements imposed by or under the principal Act.

Exemption certificates

4. The chief inspector may (subject to such conditions as may be specified therein) by certificate in writing (which he may in his discretion revoke at any time) exempt from all or any of the requirements of these Regulations—

(*a*) any factory or part of any factory; or

(*b*) any class or description of factories or parts thereof; or

(*c*) any machine, plant, apparatus or process or any class or description of machines, plant, apparatus or processes; or

(*d*) the employment of any person or any class or description of persons;

if he is satisfied that the requirements in respect of which the exemption is granted are not necessary for the protection of persons employed. Where such exemption is granted a legible copy of the certificate, showing the conditions (if any) subject to which it has been granted, shall be kept posted in any factory to which the exemption applies in a position where it may be conveniently read by the persons employed.

Preservation of records

5. Every register, certificate or record kept in pursuance of these Regulations and every transfer record and copy transfer record received by an employer in pursuance of Regulation 31 shall be preserved in the factory or in such place outside the factory as may be approved and kept available for inspection by any inspector or by the appointed doctor for at least the following periods after the last entry therein, that is to say, thirty years in the cases of the health register, the radiation dose records, the transfer records and the copy transfer records, three years in the case of the register kept in pursuance of paragraph (5) of Regulation 15 and two years in all other cases.

PART II

PRECAUTIONS OF GENERAL APPLICATION

Notification of use and disuse of ionising radiations

6.—(1) Where at the date of the commencement of this Regulation (that is to say, at the expiration of fourteen days from the making of these Regulations) a factory is being used for work to which this Regulation applies,

or there is merely a temporary cessation in such work, the occupier shall give notice in writing to that effect to the chief inspector within one month from the said date of commencement.

(2) The occupier shall give previous notice in writing to the chief inspector which, except in cases of emergency, shall be not less than one month's notice or such shorter notice as the chief inspector may agree to accept—

(*a*) before undertaking in the factory for the first time after the said date of commencement or for the first time after a notice under paragraph (3) of this Regulation has been given in respect of the factory, work to which this Regulation applies; and

(*b*) before carrying out substantial extensions or modifications to apparatus or plant emitting or protecting against ionising radiations; so, however, that where in any factory such substantial extensions or modifications are frequently carried out it shall be a sufficient compliance with this sub-paragraph if the occupier so informs the chief inspector by a written notice which specifies the period during which the notice is intended to have effect.

(3) The occupier shall either before or within seven days after ceasing to use the factory (otherwise than merely temporarily) for work to which this Regulation applies give notice in writing to that effect to the chief inspector.

(4) In this Regulation the expression "work to which this Regulation applies" means work involving the storage, manipulation, maintenance, operation, use or installation of sealed sources or the operation or use of any machine or apparatus of the kind to which paragraph (1) of Regulation 3 relates.

Instruction of persons employed

7. No person employed shall be exposed to ionising radiations unless he has received appropriate instruction (to the extent that this is necessary having regard to the circumstances of his employment) concerning the hazards involved and the precautions to be observed.

Restriction of exposure to ionising radiations

8.—(1) Without prejudice to the other requirements of these Regulations, the occupier shall do all that is reasonably practicable to restrict the extent to which the persons employed are exposed to ionising radiations; and no person employed shall expose himself to ionising radiations to a greater extent than is reasonably necessary for the purposes of his work.

(2) No person shall receive any radiation dose in excess of that permitted in the case of that person under the Schedule to these Regulations.

Shielding against ionising radiations

9. Without prejudice to the other requirements of these Regulations as to adequate shielding, all sources of ionising radiations shall, where reasonably practicable, be adequately shielded.

Direction and size of useful beam

10.—(1) Wherever practicable the useful beam shall be directed away from adjacent occupied areas.

(2) The useful beam shall be limited by appropriate means to the minimum size reasonably necessary for the work.

(3) Where appropriate, suitable measures shall be taken to limit scattered radiation.

Classified workers

11.—(1) The following persons employed shall for the purposes of these Regulations be designated as classified workers, that is to say—

(*a*) persons who are employed in work involving the storage, manipulation, maintenance, operation, use or installation of sealed sources or the operation or use of any machine or apparatus of the kind to which paragraph (1) of Regulation 3 relates, and who do not at all times work outside shielding or a demarcating barrier being shielding or a barrier outside which the radiation dose rate averaged over any one minute does not exceed 0·75 millirads in air per hour; and

(*b*) persons, whatever the nature of their work, who have attained the age of eighteen and whose designation as classified workers by the occupier is for the time being approved,

not being persons employed in accordance with an approved scheme of work within the meaning of the next following paragraph; and in these Regulations the expression "classified worker" shall be construed accordingly.

(2) In the preceding paragraph of this Regulation "an approved scheme of work" means an approved scheme of work as respects which the chief inspector is satisfied that the operating and working conditions and the system of control and instruction are such that the radiation doses received by a person working in accordance with the scheme will not exceed the doses permitted in the Schedule to these Regulations for persons other than classified workers.

(3) No person under the age of eighteen shall be employed on work which requires him to be designated as a classified worker.

(4) The names of all persons designated as classified workers shall be entered in the health register.

Arrangements for protection of workers

12.—(1) Without prejudice to the other requirements of these Regulations, where the chief inspector has reasonable cause to believe as respects any factory that any person employed has been, or is likely to be, exposed to ionising radiations to a greater extent than is reasonably necessary for the purposes of his work, the chief inspector may serve on the occupier a written notice requiring him to make approved arrangements as respects all or any of the following matters, that is to say—

(*a*) for the wearing by any person employed of photographic film or an appropriate radiation dosemeter, and for the keeping and preserving of records of doses received;

(*b*) for the monitoring of workplaces, and for the keeping and preserving of records of measurements obtained by such monitoring; and

(*c*) for the medical examination of any person employed.

(2) It shall be the duty of every person employed to comply with the requirements of any such approved arrangements in so far as they require the wearing by him of photographic film or a radiation dosemeter or require him to be medically examined.

Measurement of radiation

13.—(1) The occupier shall provide and properly maintain an appropriate and efficient radiation dosemeter or dose rate meter by means of which appropriate measurements shall be made at such intervals as are necessary for the purpose of ascertaining the efficacy of methods for the restriction of exposure to, and for shielding against, ionising radiations.

(2) All measurements under this Regulation shall be made by the competent person appointed in accordance with Regulation 21 or by an authorised person.

(3) Any dosemeter or dose rate meter provided under this Regulation may be provided for use in more than one factory. The occupier shall ensure that every such radiation dosemeter and dose rate meter is tested by a qualified person when first taken into use in the factory or, as the case may be, in the first of the factories for which it is provided, and that it is subsequently retested by a qualified person at least once in every period of fourteen months and also after any repair of a defect which could affect its accuracy. There shall be kept a register containing the prescribed particulars of every test carried out in pursuance of this paragraph.

(4) Where in any factory the occupier is neither the owner nor the hirer of a dosemeter or dose rate meter provided under this Regulation, which is used by or under the direction of some person other than the occupier or a person in the employment of the occupier, that other person or (if he is in the employment of the owner or hirer), the employer of that other person, shall in relation to that dosemeter or dose rate meter be deemed for the purpose of this Regulation to be the occupier of the factory.

Handling of sealed sources

14. No sealed source shall be handled by direct contact with the bare hand.

Construction and maintenance of sealed sources

15.—(1) The immediate container or the bonding of every sealed source shall be of adequate mechanical strength, and free from patent defect.

(2) A distinguishing number or other identifying mark shall be on or attached to every sealed source.

(3) The prescribed test for leakage of radioactive substance shall be made by a qualified person at least once in every period of twenty-six months of—

(*a*) every immediate container or bonding which forms part of a sealed source not being a sealed source permanently installed in a leak-proof container which does not form part of the sealed source; and

(*b*) every leak-proof container not forming part of the sealed source in which a sealed source is permanently installed.

(4) Where there are reasonable grounds to believe that any radioactive substance is leaking, or is likely to leak, beyond the prescribed extent from the immediate container or the bonding which forms part of a sealed source, that immediate container or bonding shall be placed in a leak-proof container forthwith and shall not be brought into use until any necessary repairs have been effected.

(5) There shall be kept a register containing the prescribed particulars of every test carried out in pursuance of paragraph (3) of this Regulation,

Breakage of a sealed source

16. In the event of the immediate container or the bonding which forms part of a sealed source being broken—

(*a*) all practicable measures shall be taken forthwith to safeguard the persons employed including, where necessary, the immediate vacation of all appropriate areas;

(*b*) notification of the breakage shall be made forthwith to the competent person appointed in accordance with Regulation 21 and to the chief inspector; and

(*c*) effective steps shall be taken as soon as practicable by or under the supervision of an authorised person to clean up areas affected by the radioactive substance. Any person taking part in such work shall be properly equipped for the purpose.

Storage of sealed sources

17.—(1) Every sealed source when not in use shall be securely stored.

(2) Where any sealed source is liable to release a radioactive gas its place of storage shall be efficiently ventilated to the open air by mechanical means for not less than two minutes before that place is opened.

(3) A sealed source shall be removed from its place of storage only by or under the supervision of an authorised person.

Register of sealed sources

18.—(1) Subject to the provisions of paragraph (3) of this Regulation, a register shall be kept showing the following particulars in respect of every sealed source in the control of the occupier, that is to say—

(*a*) the distinguishing number or other identifying mark;

(*b*) the date of receipt into the control of the occupier;

(*c*) the nature of the radioactive substance in the sealed source at the date referred to in sub-paragraph (*b*);

(*d*) the radioactive strength of the radioactive substance in the sealed source at a date specified by the occupier in the register; and

(*e*) the date, and manner of disposal of the sealed source, when it leaves the control of the occupier.

For the purposes of this paragraph whenever a sealed source is reactivated or, as the case may be, received back into the control of the occupier after reactivation, it shall be treated as in the control of the occupier for the first time.

(2) Subject to the provisions of paragraph (3) of this Regulation, an authorised person shall keep a record of the whereabouts of all sealed sources, and shall keep the record up to date on each working day.

(3) Nothing in this Regulation shall apply to sealed sources—

(*a*) in the course of their being manufactured; or

(*b*) while stored, without having been used, on the premises in which they were manufactured or in which their manufacture was completed.

Loss of a sealed source

19. If the occupier has reasonable grounds for believing that any sealed source has been lost or mislaid, he shall make immediate enquiries with a

view to finding the sealed source; and if the sealed source is not accounted for within twenty-four hours, the occupier shall notify the chief inspector forthwith. It shall be the duty of every person employed to notify the occupier forthwith if he has reasonable grounds for believing that any sealed source has been lost or mislaid.

Transfer of sealed sources

20.—(1) Sealed sources shall be transferred to and from the storage place—

(*a*) by or under the supervision of an authorised person; and

(*b*) within appropriate protective receptacles, or by other appropriate methods.

(2) All protective receptacles used to contain sealed sources shall be distinguished by orange coloured markings.

Appointment of a competent person

21.—(1) The occupier shall appoint in writing one or more competent persons to exercise special supervision with regard to the requirements of these Regulations and to assist in enforcing the observance of them.

(2) The name or names of the person or persons so appointed shall be kept posted in the factory where it or they can be conveniently read by the classified workers. Where different persons are appointed under this Regulation for different parts of the factory or for different processes the names shall be posted in such a manner that the classified workers can readily identify the competent person or competent persons appointed under this Regulation for the part of the factory or for the processes in which they are employed.

(3) Where in any factory more than one competent person is appointed under this Regulation, any reference in these Regulations to the competent person appointed in accordance with this Regulation shall be deemed to include a reference to any one of those persons or, as the case may be, to the person appointed, or to any one of the persons appointed, for the part of the factory or for the processes concerned.

PART III

TESTING OF PERSONAL EXPOSURE TO IONISING RADIATIONS AND MEDICAL SUPERVISION

Current employment in more than one factory

22. Where any person is or is to be currently employed as a classified worker in more than one factory by the same employer—

(*a*) all the factories in which that person is or is to be so currently employed shall in relation to that person be deemed, for the purposes of Regulations 25 to 27, to constitute one factory; and

(*b*) references in this Part of these Regulations to the appointed doctor shall be construed as references to the appointed doctor for any one of those factories; and

(*c*) the reference in sub-paragraph (*b*) of paragraph (1) of Regulation 25 to the health register shall be taken as a reference to the health register for any one of those factories, so, however, that as respects any period only one health register shall be used in respect of that person; and

(*d*) the reference in paragraph (1) of Regulation 27 to the factory shall be taken as a reference to any one of those factories.

Tests of personal exposure to ionising radiations

23.—(1) The occupier shall make suitable arrangements for the wearing by every classified worker of a suitable photographic film or films on an appropriate part or parts of his person and in an appropriate holder or holders during the full working period in which that worker is liable to be exposed to ionising radiations. It shall be the duty of every classified worker to wear in a proper manner any film provided for him in pursuance of this Regulation.

(2) The occupier shall obtain the films and the film holders from an approved laboratory and arrange for the films, identified by reference to the particular wearer, to be returned at appropriate intervals to that laboratory for examination and for the issue to the occupier, by the director or other responsible person at the laboratory, of certificates containing the prescribed particulars as to any radiation dose received by the wearer as indicated by the results of the examination of each film.

Radiation dose records

24.—(1) A radiation dose record shall be kept containing as respects each classified worker the prescribed particulars of the maximum radiation doses permitted under the Schedule in the case of that worker and of the radiation doses received by him whilst in protected employment.

(2) The radiation dose record as respects any worker shall be kept up to date, and shall be open to the inspection of that worker at all reasonable times.

(3) For the purposes of the radiation dose record a dose received during any period as indicated by a certificate issued in pursuance of paragraph (2) of Regulation 23 which did not fall wholly within one calendar quarter shall be deemed to have been received at a uniform rate on all the days (whether working days or not) throughout that period.

Medical examination of persons before employment as classified workers

25.—(1) Subject to paragraph (2) of this Regulation, no person shall be employed in any factory as a classified worker unless within the period of four months immediately preceding his first employment in that factory—

(*a*) he has undergone a blood examination; and

(*b*) he has been examined by the appointed doctor and, by signed entry by the appointed doctor in the health register, certified fit for employment as a classified worker.

(2) In the case of any person who, at the date of commencement of this Regulation, is employed in any factory on work as respects which he is required under these Regulations to be designated as a classified worker, paragraph (1) of this Regulation shall not apply until his next first employment in that factory; so, however, that his first examination in pursuance of Regulation 26 shall include a blood examination unless there are available to the appointed doctor as respects that worker the particulars specified in the proviso to paragraph (3) of Regulation 27.

(3) In this Regulation the expression "first employment in that factory" means first employment in that factory as a classified worker or re-employment in that factory as a classified worker following any cessation of such employment in that factory for a period exceeding fourteen months.

Medical supervision and examination of classified workers

26.—(1) The occupier shall make arrangements for medical supervision by the appointed doctor of all classified workers, including specific arrangements for medical examinations as provided in this Regulation.

(2) The occupier shall arrange for every classified worker to be examined by the appointed doctor at intervals of not more than fourteen months so long as his employment as a classified worker continues and at such other times as the appointed doctor at his discretion may determine.

(3) If at any time it appears from the certificates issued in pursuance of paragraph (2) of Regulation 23 that any classified worker has received a radiation dose in excess of that permitted under the Schedule to these Regulations, or, as the case may be, in excess of that which would be so permitted if all the ionising radiations recorded by the photographic films worn by that person were ionising radiations that have to be taken into account for the purpose of assessing the maximum permissible radiation dose under the Schedule to these Regulations, then—

(*a*) the occupier shall forthwith notify the chief inspector,

(*b*) that person employed shall undergo without delay a medical examination by the appointed doctor, and

(*c*) the competent person appointed by the occupier in accordance with Regulation 21 shall examine the circumstances of the exposure to ionising radiations and report to the occupier the action recommended in respect of the requirements of these Regulations.

Medical examinations

27.—(1) Except—

(*a*) where otherwise authorised or directed in writing by the chief inspector; or

(*b*) where at the request of the prospective employer (in pursuance of sub-paragraph (*b*) of the definition of the expression "appointed doctor") the examination is being carried out by the appointed factory doctor for the district in which the person undergoing the examination resides,

any medical examination by the appointed doctor for the purposes of these Regulations shall take place at the factory and due notice of the examination shall be given by the occupier to those concerned. It shall be the duty of the persons employed or about to be employed as classified workers to submit themselves for examination by the appointed doctor at the appointed time.

(2) As respects any medical examination for the purposes of these Regulations the appointed doctor may at his discretion require an examination of the blood or any other special examination. Any such special examination may be carried out at a place other than the factory.

(3) Every blood examination for the purposes of these Regulations shall be made by an approved laboratory or an approved person and shall be in accordance with the requirements of the appointed doctor:

Provided that any blood examination in pursuance of Regulation 25 shall (according as the appointed doctor may require) either consist of or include—

(*a*) in the case of red blood cells a measurement of the packed cell volume or an estimate of the number present per cubic millimetre of whole blood;

(*b*) in the case of white blood cells an estimate of the number present per cubic millimetre of whole blood;

(*c*) a differential white cell count;

(*d*) a search for abnormal cells and a description of any seen; and

(*e*) an estimation of the haemoglobin in grammes per one hundred millilitres of whole blood.

(4) The report of every blood examination shall be sent to the appointed doctor.

Appointed doctor's powers of suspension

28.—(1) The appointed doctor shall have power, to be exercised by written certificate in the health register signed by him, to suspend from employment as a classified worker any worker examined by him under these Regulations.

(2) No person so suspended shall be employed as a classified worker without the written approval of the appointed doctor entered in the health register.

(3) The occupier shall forthwith notify the chief inspector whenever any worker is suspended from employment in accordance with this Regulation.

Facilities for appointed doctor

29.—(1) For the purpose of examinations conducted at a factory to which these Regulations apply, the occupier shall provide for the exclusive use of the appointed doctor on the occasion of the examination a room properly cleaned and adequately warmed and lighted and furnished with a screen, a table with writing materials, chairs, an examination couch, and a wash basin with a supply of clean running hot and cold or warm water.

(2) The occupier shall afford to the appointed doctor adequate facilities for inspecting any process, operation or work in which a person being or to be examined by the appointed doctor is or is proposed to be or has been employed.

Health register

30. A health register shall be kept containing the prescribed particulars of all classified workers; and the appointed doctor shall enter in the health register the dates and results of examinations of those persons.

Transfer records

31.—(1) Where any person ceases to be employed by an employer by whom he has been employed as a classified worker that employer shall forthwith prepare a transfer record in the prescribed form and containing the prescribed particulars of the sums of radiation doses received by that person as indicated in his radiation dose record. The employer, if he knows the whereabouts of that person, shall forthwith supply him with the transfer record and shall in any case forthwith send a copy of it to the chief inspector.

(2) Before any person who was previously in protected employment with another employer is employed, or engaged for employment, as a classified worker that person shall notify his employer or, as the case may be, prospective employer of the said previous protected employment; and shall, if he has received from his employer in that previous employment a transfer record and that record is still in his possession, produce it to his employer or, as the case may be, prospective employer and make it available to the appointed

doctor. In the event of that person being employed, or engaged for employment, as a classified worker the transfer record shall be retained by the employer.

(3) When the occupier is aware that any person employed or engaged for employment, as a classified worker was previously in protected employment with another employer and that person does not produce a transfer record in pursuance of the preceding paragraph of this Regulation, the occupier shall forthwith apply to the chief inspector for a copy of that record.

PART IV

PRECAUTIONS RELATING TO CERTAIN PROCESSES

Application of Part IV of these Regulations

32. The processes to which this Part of these Regulations applies are—

(*a*) the use of ionising radiations in radiography;

(*b*) the testing of X-ray tubes and X-ray machines, being tubes and machines intended to produce ionising radiations; and

(*c*) the use of ionising radiations in the irradiation of materials for the purpose of inducing chemical, physical or biological changes, including the irradiation of materials for the purpose of sterilisation, disinfection or disinfestation or for the purpose of preserving food but not including changes induced solely for the purpose of measuring ionising radiations.

Provision of enclosure for ionising radiations

33.—(1) The processes to which this Part of these Regulations applies shall be carried on only—

(*a*) within a walled enclosure set apart for the purpose which provides adequate shielding and from which are effectively excluded all persons while any machine or apparatus therein is energised and all persons other than authorised persons when a sealed source is exposed; or

(*b*) in accordance with an approved scheme of work as respects which the chief inspector is satisfied that the operating and working conditions and the system of control and instruction are such that the radiation doses received by a person working in accordance with the scheme will not exceed the doses permitted in the case of that person under the Schedule to these Regulations:

Provided that (except in cases to which sub-paragraph (*b*) applies) where ionising radiations are being used in radiography and the provision of such a walled enclosure is not reasonably practicable, effective steps shall be taken to isolate the radiography from other work and to exclude all except authorised persons from a suitable enclosure or, where the provision of such an enclosure is not reasonably practicable, from a suitably marked area round the work.

(2) Where a walled enclosure is provided—

(*a*) effective devices shall be provided and maintained to ensure that if any door of the walled enclosure is opened while any machine or apparatus therein is energised the machine or apparatus is automatically de-energised and cannot be energised so long as that door is open; and

(*b*) the machine control panel shall be situated outside the walled enclosure.

(3) For the protection of persons who may be accidentally shut inside a walled enclosure there shall be provided and properly maintained one or more of the following, that is to say—

(*a*) means of exit so constructed that those persons can leave the enclosure without delay;

(*b*) means whereby those persons can quickly control all the sources of ionising radiations within the enclosure;

(*c*) shielding for such persons within the enclosure appropriate to the circumstances.

(4) Suitable means of communication shall be provided and maintained to enable persons shut inside a walled enclosure to summon help from outside the enclosure.

Warning signals and notices

34.—(1) Adequate warning to all persons in the vicinity shall be given by appropriate light or audible signals or by both when a sealed source is about to be exposed and while it is exposed or when a machine or apparatus is about to be energised and while it is energised:

Provided that this paragraph shall not apply where ionising radiations are about to be used, or are being used, in radiography in an enclosure or marked area in pursuance of the proviso to paragraph (1) of Regulation 33.

(2) In the case of X-ray machines or apparatus the warning signals shall be arranged to operate automatically.

(3) Suitable warning notices capable of being easily read by persons in the vicinity shall be displayed when ionising radiations are about to be used in, and while they are being used in, an enclosure or marked area in pursuance of the proviso to paragraph (1) of Regulation 33.

Operational precautions

35.—(1) Every sealed source shall be moved only by the use of a handling rod, remote controls, or an automatic method.

(2) In all the processes (other than radiography) which are carried on within a walled enclosure, while a sealed source is exposed or a machine or apparatus is energised, no material shall be brought into the beam of radiation except by the use of mechanisms operated from outside the walled enclosure.

(3) In radiography, the radiographic set-up shall be completed before the machine or apparatus is energised or before the sealed source is exposed and no changes in the set-up shall be made while the machine or apparatus is energised or otherwise than by the use of remote controls while the sealed source is exposed.

PART V

X-RAY FLUOROSCOPY AND CRYSTALLOGRAPHY

X-ray fluoroscopy

36.—(1) Every X-ray apparatus used for fluoroscopic examination shall be installed within a cabinet providing adequate shielding. Every such cabinet shall be fitted with effective devices to ensure that when any part of the cabinet is opened for any purpose the X-ray tube is automatically de-energised and cannot be energised so long as that part of the cabinet is open.

(2) While the X-ray tube is energised no article shall be inserted into, manipulated within or removed from the cabinet except by the use of devices operated from outside the cabinet.

(3) Wherever practicable, fluorescent screens shall be viewed indirectly by the use of inclined mirrors or other means.

X-ray crystallography

37.—(1) Every X-ray crystallographic apparatus shall be adequately shielded. Where access to the inside of the X-ray crystallographic apparatus is necessary, either—

(*a*) the apparatus shall be fitted with effective devices to ensure that the X-ray tube is automatically de-energised and cannot be energised so long as such access is obtained; or

(*b*) effective arrangements shall be provided, maintained and used to prevent insertion of fingers or any other part of the body into a useful beam.

(2) Where an X-ray diffraction camera or slit collimating system is in use the useful beam passing between the X-ray tube aperture and the camera or collimating system shall be completely enclosed so as to provide adequate shielding.

(3) An appropriate warning light shall be arranged to operate automatically when the X-ray tube of an X-ray crystallographic apparatus is about to be energised and while it is energised.

(4) For the purposes of this Regulation, the expression "X-ray crystallographic apparatus" includes apparatus used for X-ray spectroscopic analysis.

PART VI

MEASURING AND DETECTING DEVICES AND STATIC ELIMINATORS

Requirements as to sealed sources

38.—(1) This Regulation applies to sealed sources used in static eliminators, thickness gauges, density gauges, package monitors or level gauges.

(2) Every sealed source shall be provided with an adequate and efficient cover plate, shutter or shield capable of being easily, securely and quickly placed or moved so as to attenuate the useful beam as far as is reasonably practicable.

(3) Every such cover plate, shutter, or shield provided under paragraph (2) of this Regulation shall be used whenever practicable to attenuate the useful beam. When it is not being so used the sealed source shall be protected as far as practicable against accidental damage and abrasion.

(4) The housing of each sealed source—

(*a*) shall be legibly engraved, stamped or otherwise permanently marked to give a warning that it is radioactive; and

(*b*) shall be distinguished by orange coloured markings.

X-ray thickness gauges

39.—(1) All practicable steps shall be taken to isolate work with X-ray thickness gauges within a suitably marked area away from other work.

(2) Shielding appropriate to the circumstances shall be provided and properly maintained for the operator of an X-ray tube forming part of a thickness gauge.

(3) When an X-ray tube forming part of a thickness gauge is energised, effective arrangements shall be made to exclude from the marked area all persons other than the operator referred to in paragraph (2) of this Regulation.

(4) A warning light shall be arranged to operate automatically when an X-ray tube forming part of a thickness gauge is about to be energised and while it is energised.

(5) Suitable notices capable of being easily read by persons in the vicinity shall also be displayed when an X-ray tube forming part of a thickness gauge is about to be energised and while it is energised.

Sealed with the Official Seal of the Ministry of Labour and National Insurance for Northern Ireland this fifth day of July, nineteen hundred and sixty-two.

(L.S.) *W. Slinger,*
Assistant Secretary.

Regulations 3(6), 8(2), 11(2), 24(1), 26(3) and 33(1)

SCHEDULE

Maximum Permissible Radiation Doses

Application of Schedule

1. The doses specified in this Schedule have been determined in relation to X-rays, gamma rays, beta particles, electrons and positrons that originate in the factory—

(*a*) from any radioactive substance; or

(*b*) from any machine or apparatus that is intended to produce ionising radiations or in which charged particles are accelerated by a voltage of not less than five kilovolts not being X-ray apparatus exclusively used (in a room specially set apart for the purpose) for the prevention, diagnosis or treatment of illness or injury,

and for the purposes of this Schedule other ionising radiations shall not be taken into account.

Maximum permissible doses for classified workers

2.—(1) In any calendar quarter, the maximum permissible sum of doses for classified workers from all or any one or more of the following, that is to say, X-rays, gamma rays, beta particles, electrons and positrons shall be—

(*a*) twenty rads in air at or near the hands, forearms, feet and ankles; and

(*b*) eight rads in air at or near other parts of the body of which not more than three rads in air shall be from X-rays and gamma rays:

Provided that at or near the surface of the eyes the maximum permissible sum of doses as aforesaid (excluding beta particles of maximum energy not exceeding 2·5 MeV) shall not exceed three rads in air.

The provisions of paragraph (*b*) of this sub-paragraph shall be without prejudice to sub-paragraph (2) of this paragraph.

(2) The number of rads in air in the total cumulative dose received by any classified worker—

(*a*) at or near parts of the body other than the eyes, hands, forearms, feet and ankles from X-rays and gamma rays; or

(*b*) at or near the surface of the eyes from all or any one or more of the following, that is to say, X-rays, gamma rays, beta particles of maximum energy exceeding 2·5 MeV, electrons and positrons,

shall not, in either case, at any time exceed five times the number of years from the first day of January of the year in which that worker attained the age of eighteen. For the purpose of calculating the said total cumulative dose a part of a year shall be counted as a year.

(3) If the occupier is aware that any classified worker was during any period—

(*a*) in protected employment; or

(*b*) in employment which, if it had occurred after the coming into operation of any Regulations under the principal Act, would have been protected employment,

for which no information is available to the occupier as to the doses that worker received during that period of the kinds, and at or near the parts of the body, specified in sub-paragraph (2)(*a*) or sub-paragraph (2)(*b*) of this paragraph, that worker shall (for the purposes of the said sub-paragraph (2)(*a*) or the said sub-paragraph (2)(*b*) or, as the case may be, for the purposes of each of the said sub-paragraphs) be deemed to have received doses at the rate of five rads in air a year during that period.

Maximum permissible doses for persons other than classified workers

3. In any calendar year the maximum permissible sum of doses for persons other than classified workers from all or any one or more of the following, that is to say, X-rays, gamma rays, beta particles, electrons and positrons shall be three rads in air of which not more than one-and-a-half rads in air (or, in the case of persons who have not attained the age of sixteen, not more than half a rad in air) shall be from X-rays and gamma rays:

Provided that at or near the surface of the eyes the maximum permissible sum of doses as aforesaid (excluding beta particles of maximum energy not exceeding 2·5 MeV) shall not exceed one-and-a-half rads in air (or, in the case of persons who have not attained the age of sixteen, half a rad in air).

EXPLANATORY NOTE

(This Note is not part of the Regulations, but is intended to indicate their general purport.)

These Regulations impose requirements for the protection of persons employed in factories and other places to which the Factories Act (Northern Ireland), 1938, applies, against ionising radiations arising from—

(*a*) sealed sources; and

(*b*) machines or apparatus intended to produce ionising radiations or in which charged particles are accelerated by a voltage of not less than five kilovolts.