Ordinance on Prevention of Ionizing Radiation Hazards

Ministry of Labour Ordinance No. 41 of September 30, 1972
Latest Amendments:
Ministry of Health, Labour and Welfare Ordinance No. 172 of July 16, 2001

Japanese

The Ordinance on Prevention of Ionizing Radiation Hazards shall be enacted as follows conforming to the provisions of the Industrial Safety and Health Law (Law No. 57 of 1972) and the Enforcement Order of Industrial Safety and Health Law (Cabinet Order No. 318 of 1972) and in order to enforce the said Law.

Contents

Chapter I. General Provisions

(Basic Principle of Prevention of Ionizing Radiation Hazards)

Article 1. The employer shall endeavour to minimize the exposure of workers to ionizing radiation as low as possible.

(Definition, etc.)

Article 2. "Ionizing radiation" (hereafter called "radiation") as set forth by this Ordinance shall be defined as the following particulate rays and electromagnetic waves:

(1) Alpha-rays, deuteron-rays and proton-rays

(2) Beta-rays and electron-rays

(3) Neutron-rays

(4) Gamma-rays and X-rays

2. In this ministerial ordinance, "radioactive substances" shall be defined as radioactive isotopes (hereinafter referred to as "radioisotopes"), their compounds and the substances containing the radioisotopes which fall under any one of the following categories, except those in a solid state with a concentration of 74 Bq/g or less and those in a hermetically sealed state with a volume of 3.7 MBq or less.

(1) Radioactive substances with one kind of radioisotope: Any substance falling within one of the categories given in the left column of the following table and in quantity equal to or exceeding the quantity given in the right column of the same table corresponding to the category concerned.

Type of radioisotopes	Quantities
Strontium 90 or isotopes which emit alpha-rays (exclusive of thorium and uranium)	3.7 kBq
Isotopes which emit radioactive rays with physical half life of more than 30 days (exclusive of hydrogen 3, beryllium 7, carbon 14, sulfur 35, iron 55, iron 59, strontium 90 and substances which emit alpha-rays)	37 kBq
Isotopes which emit radioactive rays with a physical half life of 30 days or less (exclusive of fluorine 18, chromium 51, germanium 71, thallium 201 and substances which emit alpha-rays), sulfur 35, iron 55 or iron 59	370 kBq
Hydrogen 3, beryllium 7, carbon 14, fluorine 18, chromium 51, germanium 71, thallium 201, thorium or uranium	3.7 MBq

(2) Radioactive substances comprising two or more kinds of radioisotopes: Those which respectively come within the categories given in the left column of the table in the preceding item and in quantities the sum of the respective ratios of which to the quantities corresponding to their respective categories given in the right column of the same table is 1 or more.

3. The types of "radiation work" provided for by this Ordinance correspond to those listed in **Attached Table 2** of the Enforcement Order of Industrial Safety and Health Law (hereafter called "the Cabinet Order").

4. The "radioactive substances" as established by the Ministry of Health, Labour and Welfare Ordinance based on item 4 of **Attached Table 2 of the Cabinet Order** correspond to those provided in paragraph 2.

Chapter II. Controlled Area, Limit and Measurement of Dose

(Indication of a Controlled Area, etc.)

Article 3. An employer whose business involves radiation work (hereinafter referred to as the "employer" except in the case of Article 62) shall demarcate the area (hereinafter referred to as the "controlled area") that falls under any of the following by posting a sign.

(1) The area in which the total of the effective dose due to external radiation and the effective dose due to radioactive substances in the air may exceed 1.3 mSv quarterly.

(2) The area in which the surface density of a radioactive substance may exceed one-tenth of the limit listed in the Attached Table in this ordinance.

2. The calculation of the effective dose due to external radiation as prescribed in item 1 of the preceding paragraph shall be carried out the 1 cm dose equivalent.

3. The calculation of the effective dose due to radioactive substances in the air as prescribed in item 1 of paragraph 1 shall be carried out by multiplying 1.3 mSv by the equivalent of one-tenth of the average limit for three months as designated by the Minister of Health, Labour and Welfare of the average concentration of radioactive substances in the air during the working hours in a week (in the event the number of working hours in a week exceeds 40 hours or is less than 40 hours, the value used shall be obtained by multiplying the average concentration of radioactive substances in the air during the number of working hours in a week by the value obtained by dividing said working hours by 40 hours; hereinafter referred to as the "weekly average concentration")

4. The employer shall not allow persons other than those with business there to enter the controlled area.

5. The employer shall post signs concerning the requirement to wear the radiation measuring instrument specified in paragraph 3 of Article 8, warnings concerning the handling of radioactive materials and the necessary emergency measures in the event of an accident, etc., to be taken to prevent health hazards to workers due to radiation in an easily visible location in the controlled area.

(Limit of Dose in Facilities, etc.)

Article 3-2. With respect to any radiation equipment rooms in paragraph 1 of Article 15, working rooms for handling radioactive substances in paragraph 2 of Article 22, storage

facilities in paragraph 1 of Article 33 or disposal-by-storage facilities in paragraph 1 of Article 36, the employer shall limit the total of the effective dose due to external radiation and the effective dose due to radioactive substances in the air equivalent to 1 mSv or less per week at such sites that are usually entered by workers by installing shielding walls, protective screens or other shielding devices, or by installing local exhaust ventilation system or equipment which seals the emission source of gas, vapour or dust of radioactive substances.

2. The provisions of paragraph 2 of the preceding Article shall apply mutatis mutandis to the calculation of the effective dose to external radiation as prescribed in the preceding paragraph.

3. The calculation of the effective dose due to radioactive substances in the air as prescribed in paragraph 1 of this Article shall be carried out by multiplying 1mSv by the weekly average concentration limit ratio designated by the Minister of Health, Labour and Welfare under the provisions of paragraph 3 of the preceding Article.

(Dose Limit for Radiation Workers)

Article 4. The employer shall take the necessary measures to prevent workers engaging in radiation work in the controlled area (hereinafter referred to as "radiation workers") from being subjected to an effective dose not exceeding 100 mSv during 5years and not exceeding 50 mSv/year.

2. Notwithstanding the provisions of the preceding paragraph, the employer shall take the necessary measures to ensure that the effective dose for the female radiation workers (excluding those who can not become pregnant and those specified by Article 6) does not exceed 5 mSv quarterly.

Article 5. The employer shall take the necessary measures to ensure that the equivalent dose of radiation workers does not exceed 150 mSv/year for the eye lens and 500 mSv/year for the skin.

Article 6. The employer shall take the necessary measures to ensure that pregnant female radiation workers shall not be exposed to a dose that exceeds the value set in each of the following items for the period from the diagnosis of pregnancy to childbirth (hereinafter referred to as "during pregnancy"), as prescribed in the following dose classifications.

(1) 1 mSv for the effective dose due to internal exposure.

(2) 2 mSv for the equivalent dose exposure to the surface of the abdomen.

(Dose Limit in Emergency Work)

Article 7. When carrying out emergency work to protect workers from health hazards due to radiation (hereinafter referred to as "emergency work") in the event of an accident that falls under any of the items of paragraph 1 of Article 42, and in which an area as prescribed in the same paragraph is generated, notwithstanding the provisions of paragraph 1 of Article 4, and of Article 5, the employer may allow male radiation workers and female radiation workers (who can not become pregnant) to be exposed to doses that exceed the limit prescribed in such paragraphs.

2. In the event of any procedures under the preceding paragraph, the exposure dose during any such emergency work shall not exceed the value set in the following items as prescribed for each of the classifications below.

(1) 100 mSv for the effective dose.

(2) 300 mSv for the equivalent dose exposure to the eye lens.

(3) 1 mSv for the equivalent dose exposure to the skin.

3. The provision of the preceding paragraph shall be applied to male workers and female workers (who can not become pregnant) who engage in emergency work.

(Measurement of Dose)

Article 8. The employer shall measure the dose equivalent due to external exposure and the dose due to internal exposure in the controlled area for radiation workers, emergency workers and workers who enter the controlled area temporarily.

2. The dose due to external exposure provided for in the preceding paragraph shall be measured by the unit of 1 cm dose equivalent and 70 μm dose equivalent (in case of neutron radiation, 1 cm dose equivalent), providing that the measurement carried out using the radiation measuring instrument attached to the parts of the body specified in item 3 of the following paragraph in accordance with the provisions of the same paragraph shall be made by the unit of 70 μm dose equivalent.

3. The measurement of the dose due to external exposure provided for in paragraph 1 shall be made by attaching radiation measuring instrument to the parts of the body designated in the following items, providing that the dose may be calculated based on the dose equivalent rate measured by a radiation measuring instrument where measurement using radiation measuring instrument is extremely difficult, and also the same may be determined by calculation only where the application of the former method is also extremely difficult.

(1) Chest for male workers and female workers who can not become pregnant, and abdominal area for other female workers.

(2) Part most likely to be exposed to radiation out of the head, neck, chest, upper arm, abdominal area and thigh (excluding cases where the parts most likely to be exposed to radiation for male workers and female workers who can not become pregnant are the chest and upper arm and cases where the same for other female workers are the abdominal area and the thigh).

(3) Part most likely to be exposed to radiation (excluding neutron-rays), providing that such part is other than the head, neck, chest, upper arm, abdominal area and thigh.

4. The measurement of the dose due to internal exposure under the provisions of paragraph 1 shall be conducted at least quarterly (at least monthly for female workers, whose effective dose exposure may exceed 1.7 mSv in any single month (except for female workers who can not become pregnant) and female workers during pregnancy), for workers who enter sections of the controlled area where there is a possibility of taking in radioactive substances either by inhalation or oral. However, in case said person mistakenly intakes a radioactive substances either by inhalation or oral, the measurement shall be conducted as soon as possible after such intake either by inhalation or oral.

5. In measuring the dose due to internal exposure under the provisions of paragraph 1, the measured value shall be determined by the method designated by the Minister of Health, Labour and Welfare.

6. Radiation workers, emergency workers and workers who enter the controlled area temporarily shall wear radiation measuring instrument , except for cases specified in the proviso of paragraph 3.

(Checking and Recording Measurement of Dose Results)

Article 9. The employer shall check the results of the measurement of the dose due to external exposure under the provisions of paragraph 1 of the preceding Article daily for those workers who are suspected to be exposed to radiation exceeding 1 mSv/day in terms of the 1 cm dose equivalent.

2. The employer shall calculate and record the dose of radiation exposure for radiation workers listed in each of the following items without delay by using the methods designated by the Minister of Health, Labour and Welfare on the basis of the measurement and/or calculation results under the provisions of paragraphs 3 or 5 of the preceding Article, and keep such records for at least 30 years. This provision shall not apply in the event an employer turns over such records to an organization designated by the Minister of Health, Labour and Welfare, after keeping them for a period of 5 years.

(1) Quarterly, annual and 5-year totals of the effective dose for male workers and female workers (who can not become pregnant) (quarterly and annual totals of the

effective dose for workers whose effective dose did not exceed 20m Sv/year in the past five years).

(2) Monthly, quarterly and annual totals of the effective dose for female workers (except those who can not become pregnant) (quarterly and monthly totals for those with no possibility of exceeding an effective dose of 1.7 mSv per month).

(3) Quarterly and annual totals of the tissue dose equivalent by human tissue.

(4) Monthly and the during-pregnancy totals of the effective dose due to internal exposure and the equivalent dose exposure to the abdomen of female workers during pregnancy.

3. The employer shall, without delay, inform each radiation workers of the dose specified in each item of the preceding paragraph based on the records under the provisions of the preceding paragraph.

Chapter III. Protection against External Radiation

(Cylinders for Irradiation, etc.)

Article 10. When an employer uses X-ray equipment, as listed in item 33 of Article 13 of the Cabinet Order (hereafter called specified X-ray equipment) of those (which generate X-rays, and correspond to those other than X-ray equipment as provided by item 2 of **Attached Table 2 of the Cabinet Order**, the same as in the following), he shall use the irradiation cylinder or diaphragm by which the vertical angles of the irradiation areas in the form of a cone in which X-rays are stationed at its apex are made narrower than the angles necessary for actual irradiation for carrying out of radiation work, provided that this does not apply in respect to the case in which the use of the said irradiation cylinder or diaphragm may prevent the said specified X-ray equipment from being properly employed for adequate irradiation.

2. The employer shall make the irradiation cylinders and diaphragm provided by the preceding paragraph conform to the standards established by the Minister of Health, Labour and Welfare.

(Filtering Boards)

Article 11. When the employer uses specified X-ray equipment, he shall use filtering boards for use in it, provided that this does not apply in respect to a case in which the use of soft X-rays is required owing to the nature of work, or a case in which there is no possibility that workers who engage in the said work may be subjected to soft X-rays.

(Measures for Fluorography)

Article 12. In carrying out fluorography by using specified X-ray equipment, the employer shall take the following measures. However, this shall not apply in the case of using specified X-ray equipment that has a shielding structure so that the whole or part of the body of the worker engaged in fluorography work does not enter the exposure field during X-ray irradiation.

(1) With respect to the distance between the X-ray tube and the focal receiving equipment used, the X-ray radiation field shall not exceed the reception area (in case the reception area is circular and the X-ray radiation field is rectangular, the size which circumscribes the reception area).

(2) For fluorography X-ray equipment for mass chest fluorography and specified X-ray equipment other than for medical use (hereinafter referred to as "industrial use"), the primary protection shield of the receiving equipment shall limit the free-air air-kerma at a distance of 17 cm from the possible contact surfaces of the equipment (referred to as the "air-kerma" in the next item) to 1.0 microgray or less per scan.

(3) For fluorography X-ray equipment for mass chest fluorography and specified X-ray equipment for industrial use, box-shaped shielding shall be installed surrounding the irradiated object, and the air-kerma at a distance of 10 cm from the shielding shall be 1.0 microgray or less per scan.

2. Notwithstanding the provisions of the preceding paragraph, the employer may not take the measures listed for any of the following items.

(1) Pursuant to the provisions of the conditional clause in paragraph 1 of Article 15, measures specified in items 2 and 3 of the preceding paragraph in case of using specified X-ray equipment at places other than a radiation equipment room.

(2) Measures specified in item 3 of the preceding paragraph in the event any worker engaged in fluorography work can easily be evacuated to a site as prescribed in paragraph 1 of Article 3-2.

(Measures for Direct Radioscopy)

Article 13. In carrying out direct radioscopy by using specified X-ray equipment, the employer shall take the following measures. However, this shall not apply in the case of using specified X-ray equipment that has a shielding structure so that the whole or part of the body of the worker engaged in the work of direct radioscopy does not enter the exposure field during X-ray irradiation.

(1) The installation of equipment that makes it possible for worker engaged in direct radioscopy to stop the generation of X-rays, or be shielded from the same, from the present position of the operator.

(2) The installation of an automatic device that will immediately open the X-ray tube circuit in the event the current to the X-ray tube exceeds twice the rated current for the tube.

(3) With respect to the distance between the X-ray tube and the focal receiving equipment used, the X-ray radiation field shall not exceed the reception area (in case the reception area is circular and the X-ray radiation field is rectangular, the size which circumscribes the reception area).

(4) The air-kerma rate in the air of X-rays that pass the receiving equipment in the cone (hereinafter referred to as the "air-kerma rate") shall be limited to 150 microgray/h or less at a distance of 10 cm from all possible contact surfaces of the receiving equipment in the cone in the case of specified X-ray equipment for medical use, and to 17.4 microgray/h or less at a distance of 1 m from the focal point of the X-ray tube with respect to specified X-ray equipment for industrial use, etc.

(5) The air-kerma rate of the X-rays that pass any section that exceeds 3.0 cm from the maximum irradiation field at the time of direct radioscopy shall be limited to 150 microgray/h or less at a distance of 10 cm from all possible contact surfaces of the same section with respect to specified X-ray equipment for medical use, and to 17.4 microgray/h or less at a distance of 1 m from the focal point of the X-ray tube with respect to specified X-ray equipment for industrial use, etc.

(6) The installation of appropriate equipment to effectively shield any surface surrounding the irradiated object from other X-rays emanating from than cone.

2. Notwithstanding the provisions of the preceding paragraph, the employer may not take any of the following measures with respect to any of the situations described below.

(1) Measures prescribed under item 2 of the preceding paragraph in the event of installing a timer that keeps a running total of elapsed radioscopy time and issues a warning sound, etc., when a given length of time is exceeded during radioscopy.

(2) Under the provisions of the conditional clause in paragraph 1 of Article 15, measures specified in items 4 through 6 of the preceding paragraph in the event of using any specified X-ray equipment at places other than a radiation equipment room.

(Posting of Notice)

Article 14. The employer shall make up notices for the equipment or the machines listed in the left column of the following table to indicate the matters correspondingly listed in the right column of the same table according to their classifications and post each of such notices on or near the corresponding equipment or machine where the notice can be seen easily.

Machines or equipment	Items to be indicated
Cyclotrons, betatrons, and other machines to accelerate charged particles (hereafter called charged particle accelerator).	Types of machines, types of radioactive ray, and maximum energy.
Equipment loaded with radioactive substances.	Types of equipment, types and quantities of radioisotopes contained in radioactive substances loaded in the said equipment (in units of becquerel), date on which the said radioactive substances were loaded in the equipment, name of the owner of the equipment.

(Radiation Equipment Room)

Article 15. The employer intending to install the equipment or the machines listed hereunder (hereinafter referred to as "radiation equipment") shall provide an exclusive room (hereinafter referred to as "radiation equipment room") for installation except in the cases where the radiation equipment to be installed is covered with a shield capable of restricting the 1 cm dose equivalent rate due to external radiation to 20 μ Sv/hour or less at the outside, where the radiation equipment has to be moved from one place to another for use and where installing the radiation equipment stationary in an exclusive room severely hinders the effective use of the equipment or causes substantial inconvenience for the operator of the equipment.

(1) X-ray equipment.

(2) Charged particle accelerator.

(3) Equipment for removing gases from X-ray tubes or kenotron, or for inspecting these devices from which X-rays are generated.

(4) Equipment loaded with radioactive substances.

2. The employer shall put up notices which indicate a radiation equipment room at the entrance of the said rooms.

3. The provision of paragraph 4 of Article 3 shall be applied with necessary modification to the radiation equipment room.

Article 16. Deleted

(Warning Devices, etc.)

Article 17. In the events listed hereunder, the employer shall notify the persons concerned to that effect. In notifying the said events, however, the notification shall be

made by means of an automatic alarm system except in the cases where the radiation equipment has to be used in any place other than the radiation equipment room, where the X-ray equipment with the tube voltage of less than 150 kV is to be used and where the radiation equipment to be used is loaded with radioactive substances of less than 370 GBq in quantity.

(1) When the power is supplied to the X-ray equipment or charged particle accelerator.

(2) When the power is supplied to testing equipment for removing gases from X-ray tubes or kenotrons, or for inspecting these devices.

(3) When radiation equipment loaded with radioactive substances is in operation to emit the radiation.

2. The employer shall install an interlock to the entrance, where persons regularly enter from such entrance, to the radiation equipment room where the charged particle accelerator or the equipment loaded with radioactive substances of more than 111 TBq is installed.

(Entry Prohibited)

Article 18. When the X-ray equipment (restricted to those for fluorography in the case of medical X-ray equipment) or the equipment loaded with radioactive substances has to be used at any place other than the radiation equipment room, conforming to the proviso of paragraph 1 of Article 15, the employer shall prohibit workers from entering within 5 m from the focal point of the X-ray tube or the radiation source (not including places where the effective dose due to external radiation is 1 mSv/week or less) except in the cases of the entries of the workers for the preparatory work for removing the radiation source from the radiation source container, inspection of the radiation source and other necessary work, providing that the radiation source is securely contained in the radiation source container where the radiation source container, and the shutters, if provided in the said container, have closed.

2. The provisions of the preceding paragraph shall apply mutatis mutandis to cases in which the employer uses medical-use X-ray equipment for X-ray photography at places other than a radiation equipment room. In such a case, the term "5 m" in the paragraph shall be read as "2 m."

3. The provisions of paragraph 2 of Article 3 shall apply mutatis mutandis to the calculation of the effective dose due to external radiation as prescribed in paragraph 1 (including cases in which the provisions of the preceding paragraph are applied; the same shall also apply in the case of the following paragraph).

4. The employer shall put up notices which state the prohibition or stop the workers from entering into places in accordance with the provision of the paragraph 1, at the places concerned or in their vicinity.

(Measures for Transmissive Photography)

Article 18-2. When the employer uses specified X-ray equipment or gamma-ray radiation equipment for transmissive photography (which correspond to the ones used for transmissive photography, same as in the following) at the places other than the radiation equipment rooms (excluding the case in which there is no possibility that the workers are exposed to radiation) in compliance with the proviso of paragraph 1 of Article 15, the radiation shall be emitted in a direction to the places out of which said workers enter, or measures shall be taken by which to shield the X-rays for the said radiation.

(Taking out of Radiation Sources, etc.)

Article 18-3. When the employer uses gamma-ray radiation equipment for transmissive photography, he shall not take radiation sources out of the radiation source containers unless he uses source carrier devices (composed of operation devices (devices which send out and wrap up wire-release), operation tubes (tubes into which the wire-releases are guided) and also transmission tubes (tubes into which the radiation sources and wire-releases are guided, same as hereinafter) to take the radiation sources out of the containers and to place the radiation sources in the said containers, same as hereinafter).

2. Notwithstanding the provision of the preceding paragraph, the employer may take out the radiation source from the container using a remote controller other than the radiation source carrier devices when using gamma-ray radiation equipment for transmissive photography inside radiation equipment room.

Article 18-4. When the employer uses gamma-ray radiation equipment with the source carrier devices, he shall comply with the provisions as given below.

(1) The movement of the said transmission tubes shall be made after the radiation sources have been placed securely in the said radiation source containers, and after the shutters, if provided in the said radiation source containers, have closed properly.

(2) The employer shall make the angles of the apex of the cone formed by X-rays radiated narrower than those necessary for the purpose of the actual radiation with the said equipment, and make the exposure rate of gamma rays, which are radiated covering areas other than those covered by the said cone, minimized by means of collimators, etc., provided that this does not apply in respect to the case in which the purposes or aims of the said equipment are markedly hindered when using the said collimators, etc.

(Periodical Voluntary Inspection)

Article 18-5. The employer shall make voluntary inspection of gamma-ray radiation equipment for transmissive photography periodically at least once a month in terms of

the items as given below, provided that this does not apply in respect to the case in which the said equipment not used for periods of time which are longer than a month is not required to be inspected for the said period of time.

(1) The presence or absence of abnormalities in the shutters of radiation source container and devices thereby to open and shut the said containers, and also in the shutters.

(2) The presence or absence of abnormalities in the devices thereby to fasten the holder of radiation sources.

(3) For those that have source carrier devices, the presence or absence of abnormalities in the connecting portion between said devices and the radiation source container.

(4) The presence or absence of abnormalities in the source carrier devices and in the remote-control devices thereby to adjust the locations of radiation sources, if provided.

2. The employer shall make inspection of the equipment, as set forth in the proviso of the preceding paragraph in terms of each of the items of the same paragraph, before resuming the use of this equipment.

Article 18-6. The employer shall make voluntary inspection of the gamma-ray radiation equipment used for transmissive photography periodically at least once every six months in terms of the presence or absence of abnormalities in the performance thereby to shield the radiation source containers, provided that this does not apply in respect to cases in which the equipment which has not been used for periods of time which are longer than six months is not required to be subjected to the said inspection for the said periods of time.

2. The employer shall make voluntary inspection of the equipment as set forth in the proviso of preceding paragraph in terms of the presence or absence of abnormalities in the performance thereby to shield radiation source containers before resuming the use of this equipment.

(Recording)

Article 18-7. When the employer carries out voluntary inspection as stated in the preceding two Articles, he shall record the items as given below and shall keep the record in custody for the period of three years.

(1) Date of inspection.

(2) Method of inspection.

(3) Parts of equipment inspected.

(4) Results of inspection.

(5) Names of those who carry out the inspection.

(6) The contents of measures such as repair, etc., if taken on the basis of the results of the said inspection.

(Checkup)

Article 18-8. When the employer first uses gamma-ray radiation equipment for transmissive photography, when the employer repairs or improves the said equipment after the said equipment has been dismantled, or when the employer replaces previous radiation sources by new ones, he shall make a checkup in terms of each item of paragraph 1 of Article 18-5 and of the presence or absence of abnormalities in the performance thereby to shield the radiation source containers.

(Repair, etc.)

Article 18-9. When the employer has periodic voluntary inspection as provided by Article 18-5 or Article 18-6 or a checkup as set forth in the preceding Article, he shall quickly make the repair of abnormalities, if found, or assume other measures for countering the abnormalities.

(Placement of Radiation Sources)

Article 18-10. When the employer has workers engage in work to place the radiation sources into their containers or the other containers in the case in which there occur the accidents set forth in item 4 of paragraph 1 of Article 42, he shall assume measures thereby to shield the said radiation sources and shall also have the workers use forceps, etc., to provide proper distance between the said workers and the radiation sources.

(Checkup of Radiation Sources)

Article 19. When the employer uses the equipment provided with radioactive substances by moving them, he shall make a checkup, using radiation measuring instruments, in terms of whether the radiation sources has been lost or is missing, leaking out, or spilling out, and also of whether radiation sources are securely placed in the radiation source containers, if provided in the said devices, and also of whether the shutters, if provided in the radiation source containers, are securely closed immediately just after the said equipment have been used, and also when they are put into the storage place after the daily work.

2. In a case in which confirmation is made of a loss or missing, leakage or spilling of radiation sources, radiation sources being not placed securely in the radiation source containers, and the non-or half-closure of shutters of the radiation source containers,

the employer shall look for the lost or missing radiation sources, repair the said container, or assume measures necessary for prevention of health impairment of the workers concerned.

Articles 20 and 21. (Deleted)

Chapter IV. Prevention of Contamination

(Working Rooms for Handling Radioactive Substances)

Article 22. When the employer handles radioactive substances which are not tightly closed, he shall provide a working room used exclusively for the handling of the said radioactive substances, and shall handle the said radioactive substances in the said room, provided that this does not apply in respect to a case in which use is made of radioactive substances by distributing or moving the said radioactive substances in extensive areas for carrying out of investigations into water leakage, epidemiological investigations with insects, investigations into moving statuses in the manufacturing processes of raw materials, etc., and in which use as specified above is temporary, or a case in which mining is made of nuclear raw materials (nuclear raw materials shall be defined as those provided for by item 3 of Article 3 of the Atomic Energy Basic Law (Law No. 186, 1955), same as in the following).

2. The provisions of paragraph 4 of Article 3 and paragraph 2 of Article 15 shall be applied with necessary modification to the work room where radioactive substances are handled (meaning the work room defined in the preceding paragraph and the exclusive passage for the workers to engage in the work defined in provision of the same paragraph).

(Structures of Working Rooms for Handling Radioactive Substances)

Article 23. In terms of the portions which may be contaminated with radioactive substances, comprising walls, floors, etc., in the inside of the said working rooms therein to handle radioactive substances, the employer shall provide the said walls, floors, etc., in a structure as provided below:

(1) The walls, floors, etc., shall be made of materials which are extremely resistant to permeation by gas or fluid, and also which are corrosion-proof.

(2) The said walls, floors, etc., shall have smoothly finished surfaces.

(3) The walls, floors, etc., shall be in a structure in which the said walls, floors, etc., have only necessary number of concave-convex portions, and crevices.

(Concentrations of Radioactive Substances in the Air)

Article 24. The employer whose employees engage in the mining of nuclear raw materials in mine shall control the average of the daily averages of the concentration of such substance in three months to the level or lower than the level designated by the Minister of Health, Labour and Welfare under paragraph 3 of Article 3.

Article 25. The employer shall control the three-month average of the weekly average concentration in workplaces other than working rooms for handling radioactive substances and/or the inside of quarries for mining nuclear raw materials to one-tenth or less of the limit designated by the Minister of Health, Labour and Welfare under paragraph 3 of Article 3.

(Facilities to Prevent Dispersion)

Article 26. When there may occur a case in which dispersion is made of spray or powder of radioactive substances resulting from handling of the said radioactive substances, the employer shall install or provide facilities with boards, curtains, etc., thereby to prevent the said spray or powder of radioactive substances from adhering to the bodies of workers, or clothes, footwear, working clothes, personal protective equipment, etc., which the said workers wear (hereafter called "equipment worn"), provided that this does not apply in respect to a case in which installation of the said facilities are extremely difficult resulting from the conditions under which the said work is being carried out and also a case in which the employer has the said workers concerned wear personal protective equipment as provided for by paragraph 1 of Article 39.

(Tools to Handle Radioactive Substances)

Article 27. The employer shall post written notices which state the exclusive use of forceps, pincettes, etc., in handling of radioactive substances, and attach the notices to the said forceps, pincettes, etc. In addition, he shall not allow workers concerned to use these tools for other purposes.

2. When the employer does not use the said forceps, pincettes,, etc., he shall keep the forceps, pincettes, etc., in custody, using tool-storing hanger, boxes, etc., which are of a structure such that easy removal can be made of contaminated radioactive substances and also which are made of materials thereby to enable the said contaminated radioactive substance to be easily removable.

(Measures Assumed when Radioactive Substances Spill, etc.)

Article 28. When the workplace is contaminated with radioactive substances, either in liquid form or powder form, by means of an accident such as spilling, the employer shall immediately take measures for preventing the spread of the contamination, indicate the area where contamination is likely by putting up warning notices and remove the contaminant until the degree of the contamination is reduced to the limit or less than the limit listed in the **Attached Table**, providing that the level to which the contamination is

to be reduced may be one tenth of the limit listed in the said table where the contamination has occurred in the place other than working rooms for handling radioactive substances.

(Inspection into Contamination in Working Rooms for Handling Radioactive Substances)

Article 29. The employer shall inspect the ceiling, floor, walls and facilities, etc. of working rooms for handling radioactive substances at least monthly, and, if said objects are found to be contaminated to the levels exceeding the limits listed in the **Attached Table**, the employer shall remove the contaminant until the levels of the contamination of the said objects are reduced to the limits or below the limits listed in the annexed table.

2. When the employer has workers clean the said objects to remove the radioactive substances as set forth in the preceding paragraph, he shall use methods thereby to invite no dispersion of radioactive substance dust.

(Inspection of Contamination of Contamination Removing Tools, etc.)

Article 30. When the removal of the contamination or the cleaning for the objects designated in Article 28 or paragraph 1 of the preceding article is done, the employer shall inspect the tools used for such removal of contamination or cleaning inspected for contamination each time when such contamination removing or cleaning work is done, and, if the tools are found contaminated to levels exceeding the limits listed in the **Attached Table**, the employer shall prohibit the workers from using such tools until the contamination of the tools is reduced to the levels lower than those listed in the said table.

2. The employer shall post a written notice which states that the tools have been contaminated with radioactive substances at locations or places where the said devices are kept in custody.

3. The provision of paragraph 2 of Article 27 shall apply correspondingly in respect to the tools as provided by the paragraph 1.

(Contamination Inspection of Workers Leaving Working Rooms)

Article 31. The employer shall provide a contamination inspection room at the entrance to working rooms for handling radioactive substances in order to inspect the contamination of workers' bodies and equipment worn carried by the individual workers who are to leave the said working room.

2. When the levels of the contamination of the workers' bodies and equipment worn carried by the individual workers are found to exceed one tenth of the limits listed in the **Attached Table** through the inspection, the employer shall not permit the contaminated

workers to leave the working room for handling radioactive substance unless the workers go through the following contamination removing requirements:

(1) Wash the body until the level of contamination is reduced to less than one tenth of the limit designated in the **Attached Table**, if the body is contaminated.

(2) Take off or remove equipment worn from their bodies, if such equipment worn are contaminated.

3. In accordance with instructions as provided by the preceding paragraph, the workers shall wash their bodies or take off or remove their equipment worn from their bodies.

(Inspection of Contamination of Goods Taken out of Working Rooms)

Article 32. In terms of goods which the workers take with them out of the working rooms for handling radioactive substances, the employer shall inspect the status of contamination of the said goods with radioactive substances at contamination inspection room as described in the paragraph 1 of the preceding Article when the workers take the goods with them leaving the said working rooms.

2. Both the employer and its employees shall not be allowed to bring out the goods found to be contaminated respectively to the levels exceeding one tenth of the limit designated in the **Attached Table** through the inspection conforming to the provision of the preceding paragraph except where such contaminated goods are to be carried to the contamination removing facilities, contaminated objects storage facilities, contaminated objects disposal facilities or other working room for handling radioactive substances in which they use the containers as provided for by the text of paragraph 1 of Article 37 or assume measures for the proviso of the same paragraph.

(Storage Facilities)

Article 33. The employer intending to store the objects found to be contaminated respectively to the level exceeding one tenth of the limit designated in the **Attached Table** (hereinafter referred to as "contaminated objects") shall store the contaminated object in such a storage facility separated from external circumstances, and also which are provided with a locking mechanism and other closing devices or tools at the portions which lead to the outside of the said facilities such as doors, covers, etc.

2. The employer shall post notices which state the existence of the storing facilities at places from which the notices can easily been seen outside the said storage facilities.

3. The provision of paragraph 4 of Article 3 shall be applicable with necessary modification to the storage facilities set forth in paragraph 1.

(Facilities for Exhausted Air or Fluid)

Article 34. When the employer draws exhausted air or fluid out of working rooms for handling radioactive substances, stores the said exhausted air or fluid, or purifies the said exhausted air or fluid, he shall draw, store or purify the said exhausted air or fluid in the facilities in a structure in which the facilities have no fear that there may occur discharge of air or fluid from the said facilities, also in which the facilities are made of materials which are extremely resistant to corrosion and impermeable by the said discharged fluid.

2. The provisions of paragraph 2 of the proceeding Article shall apply correspondingly in respect to the facilities as set forth in the storage and disposal facilities set forth in the proceeding paragraph.

(Incinerators)

Article 35. When the employer incinerates radioactive substances or contaminated objects, he shall use the incinerator in a structure in which there is no possibility that leakage or dispersion may take place of air or ashes, respectively, from the said incinerator.

2. The provision of paragraph 2 of Article 33 shall be applicable with necessary modification to the incinerator set forth in the preceding paragraph.

(Disposal-by-Storage Facilities)

Article 36. When the employer dispose radioactive substances or contaminated objects by storage, he shall do the said disposal- by-storage in the said facilities, separated from external circumstances, and also which are provided with a locking mechanism and other closing devices or tools at the portions which lead to the outside of the said facilities such as doors, covers, etc.

2. The provisions of paragraph 4 of Article 3 and paragraph 2 of Article 33 are respectively applicable with necessary modifications to the disposal-by-storage facilities set forth in the preceding paragraph.

(Containers)

Article 37. When the employer stores or keeps radioactive substances, or carries radioactive substances or contaminated objects, stores these substances to dispose, or stores temporarily these substances for a while to dispose, he shall use containers, provided that this does not apply in respect to a case in which it is extremely difficult to store these substances in the said containers, he assumes effective measures thereby to shield external radiation, to prevent spreading of contamination with radioactive substances, or carries radioactive substances in working rooms for handling radioactive substances.

2. When using the containers designated in the preceding paragraph for the purposes listed in the left column of the following table, the employer shall make sure that each of such containers has the structure correspondingly listed in the right column of the same table according to the classified uses.

Usage	Structure
To contain radioactive substances or contaminated objects that may cause air pollution	To be made of corrosion-resistant material and to be air tight
To contain liquid radioactive substances or wet contaminated objects by such radioactive substances.	To be made of material capable of resisting corrosion and impermeable to the liquid and have a liquid-tight construction
To contain radioactive substances or contaminated objects in order to transport them to outside of the controlled area	1) To meet the requirement that the 1 cm dose equivalent at the surface of the container (at the surface of the packing when packed, the same shall apply below in this item) is less than 2 mSv/hour or10 mSv/hour where transportation is by exclusive freight under the provisions of item 6 of Article 1 of the Ordinance on Transport of Containers Outside of Nuclear Fuel, etc., Factories and Facilities (Ordinance of Prime Minister's Office No. 57, 1978) (called "exclusive freight" below) where the technical standard of the transportation complies with paragraph 2 of Article 4 and each item of paragraph 3 of Article 19 of the Ordinance on Vehicular Transport of Nuclear Fuel Material, etc. (Ministry of Transport Ordinance No. 72, 1978) and paragraph 2 of Article 4 and each item of paragraph 3 of Article 18 of the Ordinance on the Vehicular Transport of Radioactive Isotopes (Ministry of Transport Ordinance No. 33, 1977) and Minister of Health, Labour and Welfare approval that there are no obstacles to preventing health hazards for workers is received. 2) The 1 cm dose equivalent rate at a distance of 1 m from the surface of the container is 0.1 mSv/hour or less. This shall not apply when the container is transported using exclusive freight and Minister of Health, Labour and Welfare approval that there are no obstacles to prevent health hazards for workers is received.

3. The employer shall put notices on the containers as described in paragraph 1, which say that the containers are those therein to contain radioactive substances or contaminated objects.

4. The employer shall indicate the items, as given below, on the containers in which to store, keep or carry the substances, or store temporarily the substances for a while to dispose of the said substances.

(1) Types of radioactive substances and classification of gas, liquid or solid of the radioactive substances.

(2) Types of radioisotopes contained in the radioactive substances and quantities of the radioisotopes.

(Personal Protective Equipment)

Article 38. When the employer whose workers engage in the work in the area designated in the provision of Article 28 or emergency work in which the workers may inhale the air contaminated to the level exceeding that designated by the Minister of Health, Labour and Welfare under paragraph 3 of Article 3, such employer shall provide the effective personal respiratory protective equipment depend on the level of contamination such as the dust masks, gas masks, hose masks, oxygen breathing apparatus, etc., to the workers.

2. While the workers are engaging in the work as provided for by the preceding paragraph, they shall use the personal protective equipment described in the same paragraph.

Article 39. The employer whose workers engage in the work in which the workers may be contaminated to the level exceeding one tenth of the limit designated in the **Attached Table** shall provide effective protective clothes, gloves and shoes to the workers.

2. While the workers engage in the work as provided by the preceding paragraph, they shall use the personal protective equipment described in the same paragraph.

(Working Clothes)

Article 40. When the employer has workers engage in the work in the working rooms for handling radioactive substances, he shall provide working clothes used exclusively for work in the said rooms, and shall have the workers use the said working clothes when the workers engage in the said work.

(Decontamination of Personal Protective Equipment, etc.)

Article 41. When the personal protective equipment or working clothes to be used conforming to the provisions of the preceding three articles are found to be contaminated to the levels exceeding those designated in the **Attached Table** (to one tenth of the limit designated in the same table for the parts of the personal protective equipment or working clothes which directly come into contact with the bodies of the

workers, which applies hereinafter in this article), the employer shall not allow the workers to use such objects unless they are decontaminated by cleaning, etc., to the levels less than the limit designated in the said table.

(Prohibition of Smoking, etc.)

Article 41-2. The employer shall prohibit workers from smoking, drinking or eating in working rooms for handling radioactive substances or any other work room where there is a possibility that workers may inhale or take in a radioactive substance and put up warning notices to such effect in easily visible locations in the work rooms concerned.

2. The workers shall not smoke, drink or eat in the work rooms specified in the preceding paragraph.

Chapter IV-II. Control of Special Work

(Working Rules at Processing Facilities, Etc.)

Article 41-3. In carrying out work involving the handling of nuclear fuel materials (such as those prescribed in paragraph 2 of Article 3 of the Atomic Energy Basic Law (Law No. 186, 1955); hereinafter the same), spent fuel materials (such as those prescribed in paragraph 8 of Article 2 of the Law Concerning Regulations on Nuclear Raw Materials, Nuclear Fuel Materials and Nuclear Reactors; hereinafter the same), or anything contaminated by such materials (including fission products; hereinafter the same) within a controlled area of a processing facility (such as those prescribed in item 2, paragraph 2 of Article 13 of the Law Concerning Regulations on Nuclear Raw Materials, Nuclear Fuel Materials and Nuclear Reactors (Law No. 166, 1957), which are the same as in paragraph 1 of Article 52-6), reprocessing facilities (such as those prescribed in item 2, paragraph 2 of Article 44 of the same law, which are the same as in Paragraph 1 of Article 52-6), or facilities that use such materials, etc. (such as those prescribed in paragraph 3 of Article 53 of the same law [limited to those using nuclear fuel materials as prescribed in Article 16-2 of the Cabinet Order Concerning the Regulations on Nuclear Raw Materials, Nuclear Fuel Materials and Nuclear Reactors (Cabinet Order No. 324, 1957)]; which are the same as in paragraph 1 of Article 52-6), the employer shall formulate regulations necessary to protect workers from hazards due to radiation for such work with respect to the following matters, and shall carry out such work according to such regulations.

(1) Operations of processing facilities, reprocessing facilities or facilities that use such materials, etc.

(2) Coordination and adjustment of safety devices and automatic alarm devices.

(3) Steps to prevent nuclear fuel materials from accidentally reaching a critical state.

(4) Operational methods and procedures.

(5) Measures concerning the monitoring of dose equivalent rates due to external radiation and the concentration of radioactive substances in the air.

(6) Measures concerning inspections with respect to the contamination of surface areas of the ceilings, floors, walls, facilities, etc., and the removal of such contamination.

(7) Emergency measures at the time any abnormal event occurs.

(8) In addition to each item above, the measures necessary to protect workers from radiation hazards.

2. When formulating the regulations prescribed in the preceding paragraph, the employer shall take steps to ensure that the workers involved become fully aware of each item in the same paragraph.

(Working Rules at Nuclear Reactor Facilities)

Article 41-4. In carrying out work involving the handling of nuclear fuel materials, spent fuel materials, or anything contaminated by such materials within a controlled area of nuclear reactor facilities (such as those prescribed in item 5, paragraph 2 of Article 23 of the Law Concerning Regulations on Nuclear Raw Materials, Nuclear Fuel Materials and Nuclear Reactors; which are the same as in paragraph 1 of Article 52-7), the employer shall formulate regulations necessary to protect workers from hazards due to radiation for such work with respect to the following matters, and shall carry out such work according to such regulations.

(1) Operational methods and procedures.

(2) Measures concerning the monitoring of dose equivalent rates due to external radiation and the concentration of radioactive substances in the air.

(3) Measures concerning inspections with respect to the contamination of surface areas of the ceilings, floors, walls, facilities, etc., and the removal of such contamination.

(4) Emergency measures at the time any abnormal event occurs.

(5) In addition to each item above, the measures necessary to protect workers from radiation hazards.

2. When formulating the regulations prescribed in the preceding paragraph, the employer shall take steps to ensure that the workers involved become fully aware of each item in the same paragraph.

Chapter V. Emergency Measures

(Evacuation)

Article 42. When an accident under any one of the following categories has occurred, the employer shall have the workers immediately evacuate the area in which the effective dose resulting from the accident may exceed 15 mSv.

(1) The shield installed conforming to the provision of paragraph 1 of Article 3-2 is broken in the middle of the handling of the radioactive substance or in the middle of irradiation using the radioactive substance, and the irradiation cannot be stopped immediately.

(2) The local exhaust ventilation system or the emission source enclosure system installed conforming to the provisions of paragraph 1 of Article 3-2 does not function properly due to faults or damage.

(3) A great deal of radioactive substance has leaked, spilled or been scattered.

(4) The radiation source loaded with the radioactive substance has fallen from the radiation source container or the radiation source taken out of its container has become unable to be returned into the housing due to the radiation source carrier device or the remote control system to control the position of the radiation source.

(5) Accidents other than those described above.

2. The employer shall put up a notice which indicates the existence of the areas described in the preceding paragraph.

3. The employer shall not have workers enter into the areas as described in paragraph 1, provided that this shall not apply in respect to the case in which the employer has the workers engage in emergency work.

(Report on Accidents)

Article 43. When there occur areas as provided for by paragraph 1 of the preceding Article, the employer shall submit a report to the chief of the Labour Standards Inspection Office with jurisdiction of the vicinity of the districts in which the workplace exists (hereafter called the Chief of the competent Labour Standards Inspection Office).

(Medical Examination, etc.)

Article 44. The employer shall immediately have those workers falling under any one of the following categories receive the medical examination or treatment of a medical doctor.

(1) Those who were in the area designated in paragraph 1 of Article 42 when any one of the accidents designated in the items of the said paragraph of the said article occurred.

(2) Those who have been exposed to the effective dose or equivalent dose exceeding the limit specified in paragraph 1 of Article 4, or Article 5.

(3) Those who accidentally inhaled or orally took in a radioactive substance.

(4) Those who have been unable to reduce the contamination of their bodies to one tenth of the limit specified in the **Attached Table** by washing their bodies, etc.

(5) Those with wounded parts of their bodies contaminated by a radioactive substance.

2. When the employer finds the case in which there are workers falling in any items of preceding paragraph, he shall make a report on that fact to the Chief of the competent Labour Standards Inspection Office without delay.

(Measurement and Recording of Accidents)

Article 45. When an accident falling in any one of the categories designated in the items of paragraph 1 of Article 42 has occurred, and the area designated in the said paragraph has come to exist as a result, the employer shall measure the effective dose and equivalent dose for eye lens and skin to which each of the workers present in the said area or each of those who have engaged in emergency work in the said area has been exposed, and make up the records of the following matters, and keep them on file for at least five years.

(1) Time, date and place of the accident

(2) Cause and condition of the accident

(3) Condition of the impairments caused by the radiation

(4) Emergency measures taken by the employer

2. When the effective dose or equivalent dose is not known for those workers provided for in the preceding paragraph, the employer shall measure the dose equivalent rate due to the external radiation at the main spots in the area designated in paragraph 1 of Article 42, the concentration of the radioactive substances in the air or the surface density of the radioactive substances with the appropriate radiation measuring instruments and calculate the effective dose equivalent and equivalent dose defined in the preceding paragraph based on the result of the said calculation.

3. When it is extremely difficult to measure the dose equivalent rate provided for in the preceding paragraph using the radiation measuring instrument, it may be determined by calculation, notwithstanding the provision of the said paragraph.

Chapter VI. Operations Chief of Work with X-ray and Operations Chief of Transmissive Photography with Gamma-Rays

(Appointment of an Operations Chief of Work with X-rays)

Article 46. In terms of the work as provided for by item 5 of Article 6 of the Cabinet Order, the employer shall appoint on operations chief of work with X-rays from among those who have been granted the license for operations chief of work with X-rays in each of the controlled areas.

(Duties of Operations Chief of Work with X-rays)

Article 47. The employer shall have the operations chief of work with x-rays perform the following functions:

(1) Make sure that the notices conforming to paragraph 1 of Article 3 or paragraph 4 of Article 18 are put up as provided for in said paragraph.

(2) Make sure that the irradiation cylinder or diaphragm conforming to paragraph 1 of Article 10 or the filtration plate conforming to Article 11 are used properly.

(3) Make sure that the measures conforming to each item of Article 12 or 13 , or Article 18-2 are taken accordingly.

(4) Control the irradiation condition so that the dose of the exposure to the radiation workers can be minimized as low as possible, in addition to the measures as provided for by the preceding two items.

(5) Inspect whether the measures provided for in paragraph 1 of Article 17 is taken conforming to the provision of the said paragraph of the said article.

(6) Make sure that the place designated in paragraph 1 of Article 18 is cleared of workers before the start of and during the irradiation.

(7) Inspect whether the radiation measuring instrument provided for in paragraph 3 of Article 8 is in conformity to the provision of the said paragraph.

(License for Operations Chief of Work with X-rays)

Article 48. The license for operations chief of work with X-rays shall be granted to those who have passed the license examination for operations chief of work with X-rays

and also to those as listed in the following items by the Director General of the Prefectural Labour Bureau.

(1) Those who have been granted the license as provided for by the provisions of paragraph 1 of Article 3 of the Law concerning Technicians Responsible for Medical Treatment with Radioactive Substances (Law No. 226, 1951).

(2) Those who are granted the license for chief technicians responsible for operation of nuclear reactors as provided for by paragraph 1 of Article 41 of the Law concerning Regulation of Nuclear Raw Materials, Nuclear Fuel Materials, and Nuclear Reactors (Law No. 166, 1957).

(3) Those who are granted the license for first class chiefs responsible for handling of radioactive substances as provided for by paragraph 1 of Article 35 of the Law concerning Prevention of Radiation Hazards due to Radioisotopes, etc. (Law No. 167, 1957).

(Reasons for Not Granting a License for Operations Chief of Work with X-rays)

Article 49. Those who are so designated by the Ministry of Health, Labour and Welfare Ordinance based on the provisions of item 2 of paragraph 2 of Article 72 of the Industrial Safety and Health Law (hereafter called "the Law"), concerning licenses for operations chief of work with X-rays, shall be younger than 18 years old.

(Subjects, etc., in License Examination for Operations Chief of Work with X-rays)

Article 50. The license examination for operations chief of work with X-rays shall be conducted in terms of the following subjects in the form of paper tests:

(1) Knowledge of control of X-rays

(2) Knowledge of measurements of X-rays

(3) Knowledge of effects of X-rays on organisms

(4) Related laws and ordinances

(Exemption of Examination Subjects for License Examination of Operations Chief of Work with X-rays)

Article 51. The Director General of the Prefectural Labour Bureau may exempt those who fall under any one of the categories set forth in the following items from the examination subjects designated in each of the said paragraphs in the license examination for the operations chief of work with x-rays.

(1) Those who have been granted the license of the class-2 radiation-related work supervisor conforming to paragraph 1, Article 35 of the Law concerning Prevention of Radiation Hazards Due to Radioisotopes, etc. and the class-2 radiation-related work supervisor (general license) conforming to paragraph 1, Article 17-5 of the Enforcement Order (Cabinet Order No. 259 of 1960) of the said Law may be exempted from the examination subjects designated in items 2 and 3 of the preceding Article.

(2) Those who have been granted the license of operations chief of transmissive photography with gamma-rays may be exempted from the examination subjects designated in item 3 of the preceding paragraph.

(Details on License Examination for Operations Chief of Work with X-rays)

Article 52. In addition to the items as provided by Article 71 of the Ordinance on Industrial Safety and Health (Ministry of Labour Ordinance No. 32, 1972, hereafter called "Safety and Health Ordinance") and also by the preceding two Articles, the items necessary for carrying out of the license examination for operations chief of work with X-rays will be established by the Minister of Health, Labour and Welfare.

(Appointment of Operations Chief of Transmissive Photography with Gamma-Rays)

Article 52-2. In terms of the work listed in item 5-2 of Article 6 of the Cabinet Order, the employer shall appoint an operations chief of transmissive photography with gamma-rays from among those who have been granted the license for operations chief of transmissive photography with gamma-rays in each of the controlled areas.

(Duties of Operations Chief of Transmissive Photography with Gamma-Rays))

Article 52-3. The employer shall have the operations chief of transmissive photography with gamma rays perform the following functions:

(1) Make sure that the notices provided for in paragraph 1 of Article 3 or paragraph 4 of Article 18 are put up conforming to the provision of the said paragraph of the said Article.

(2) Inspect the performance of the radiation source carrier devices or remote control system to adjust the position of the radiation source before starting its operation.

(3) Check whether the transmission tube is moved conforming to the provision of item 1 of Article 18-4 and also whether the radiation source is taken out conforming to the provision of Article 18-3.

(4) Make sure that the place designated in paragraph 1 of Article 18 is cleared of the workers before and during the irradiation.

(5) Inspect whether the measures provided for in paragraph 1 of Article 17 are executed accordingly and also whether the radiation measuring instrument designated in paragraph 3 of Article 8 is installed accordingly.

(6) Take the measures provided for in Article 18-2.

(7) Take the measures provided for in item 2 of Article 18-4.

(8) Control the irradiation condition so that the dose of the radiation workers can be minimized as low as possible, in addition to taking the measures of the above two items.

(9) Inspect the position of the radiation source and the condition of the shield using the measuring instrument during the operation.

(10) Conduct the inspection provided for in paragraph 1 of Article 19.

(11) Take the measures provided for in item 4 of paragraph 1 of Article 42 when the accident designated in the said article occurs and notify the employer to that effect.

(12) Take the measure provided for in Article 18-10 in carrying out the work for putting the radiation source into the radiation source container or other container and have the workers use the forceps, etc., in order to keep an appropriate distance between the workers and the radiation source at the time of the accident designated in item 4 of paragraph 1 of Article 42.

(License for Operations Chief of Transmissive Photography with Gamma-Rays)

Article 52-4. The license for operations chief of transmissive photography with gamma-rays shall be granted by the Director General of the Prefectural Labour Bureau to those who have passed the license examination of operations chief of transmissive photography with gamma rays and those who fall under any one of the following categories:

(1) Those who have the license conforming to paragraph 1, Article 3 of the Law concerning Technicians Responsible for Medical Treatment with Radioactive Substances.

(2) Those who have the license of the Nuclear Reactor Operation Supervisor conforming to paragraph 1, Article 41 of the Law concerning Regulation of Nuclear Raw Material, Nuclear Fuel Materials and Nuclear Reactors.

(3) Those who have the license for the class 1 radiation-related operation supervisor conforming to paragraph 1, Article 35 of the Law concerning Prevention of Radiation Hazards Due to Radioisotopes, etc. or the license (general license) of class-2 radiation-related operation supervisor conforming to paragraph 1, Article 17-5 of the Enforcement Order of the said Law.

(Reasons for Not Granting a License for Operations Chief of Transmissive Photography with Gamma-Rays)

Article 52-4-2. Those who are designated as such by the Ministry of Health, Labour and Welfare Ordinance based on the Provisions of item 2 of paragraph 2 of Article 72 of the Law concerning licenses for operations chief of transmissive photography with gamma-rays, shall be younger than 18 years old.

(Subjects, etc., in License Examination for Operations Chief of Transmissive Photography with Gamma-Rays)

Article 52-4-3. The license examination for operations chief of transmissive photography with gamma-rays shall be conducted in terms of the following subjects in the form of paper tests:

(1) Knowledge on work to undertake transmissive photography with gamma-rays.

(2) Knowledge on gamma-rays radiation equipment.

(3) Knowledge on effects of gamma-rays on organisms.

(4) Related laws and ordinances.

(Exemption of Subjects in License Examination for Operations Chief of Transmissive Photography with Gamma Rays)

Article 52-4-4. The Director General of the Prefectural Labour Bureau may grant exemptions in the subjects for examination listed in item 3 of the preceding Article out of the subjects of examination in the license examination for operations chief of transmissive photography with gamma rays for those who have passed the license examination for operations chief of work with X-rays.

(Details on License Examination for Operations Chief of Transmission Photography with Gamma Rays)

Article 52-4-5. In addition to the items as provided by Article 71 of the Safety and Health Ordinance and also by the preceding two Articles, the items necessary for carrying out of the license examination for operations chief of transmissive photography with gamma rays will be established by the Minister of Health, Labour and Welfare.

Chapter VI-II. Special Education

(Special Education Concerning Work to Undertake Transmissive Photography)

Article 52-5. When the employer has workers engage in work to undertake transmissive photography with X-ray equipment or with gamma-ray radiating equipment, he shall give special education to the said worker in terms of the subjects as given below:

(1) Methods for carrying out the work thereby to undertake transmissive photography.

(2) Structure of X-ray equipment and gamma-ray radiating equipment, and on how to operate this equipment.

(3) Effects of ionizing radiation on organisms.

(4) Related laws and ordinances.

2. In addition to the items as provided for by Article 37 and 38 of the Safety and Health Ordinance and also by the preceding paragraph, the details necessary for carrying out the special education as provided for by the same paragraph will be established by the Minister of Health, Labour and Welfare.

(Special Education Concerning Work Involving the Handling of Nuclear Fuel Materials, etc., at Processing Facilities, etc.)

Article 52-6. When the employer assigns workers to engage in work involving the handling of nuclear fuel materials, spent fuel materials, or anything contaminated by such materials within a controlled area of processing facilities, reprocessing facilities, or facilities that use such materials, etc., the employer shall provide special education to said workers in terms of the subjects as given below.

(1) Knowledge about nuclear fuel materials, spent fuel materials, or anything contaminated by such materials.

(2) Knowledge about work methods at processing facilities, reprocessing facilities, or facilities that use such materials, etc.

(3) Knowledge about equipment structure and handling method concerning processing facility, reprocessing facility, or facilities that use such materials, etc.

(4) Effects of ionizing radiation on organisms.

(5) Related laws and ordinances.

(6) Work method at processing facility, reprocessing facility, or facilities that use such materials, etc., and the handling of equipment concerning such facilities.

2. In addition to the items specified in Articles 37 and 38 of the Safety and Health Ordinance and also in the preceding paragraph, the details necessary for carrying out

the special education as provided for under the same paragraph shall be established by the Minister of Health, Labour and Welfare.

(Special Education Concerning Work Involving the Handling of Nuclear Fuel Materials, etc., at Nuclear Reactor Facilities)

Article 52-7. When the employer assigns workers to engage in work involving the handling of nuclear fuel materials, spent fuel materials, or anything contaminated by such materials within a controlled area of nuclear reactor facilities, the employer shall provide special education to said workers in terms of the topics itemized below.

(1) Knowledge about nuclear fuel materials, spent fuel materials, or anything contaminated by such materials.

(2) Knowledge about work methods at nuclear reactor facilities.

(3) Knowledge about the equipment structure and handling methods concerning nuclear reactor facilities.

(4) Effects of ionizing radiation on organisms.

(5) Related laws and ordinances.

(6) Work methods at nuclear reactor facilities and the handling of equipment concerning such facilities.

2. In addition to the items specified in Articles 37 and 38 of the Safety and Health Ordinance and also in the preceding paragraph, the details necessary for carrying out the special education as provided for under the same paragraph shall be established by the Minister of Health, Labour and Welfare.

Chapter VII. Working Environment Measurement

(Workshops Where the Working Environment Measurement Shall Be Done)

Article 53. The workshops as established by the Ministry of Health, Labour and Welfare Ordinance based on the item 6 of Article 21 of the Cabinet Order are as given below:

(1) The portion which corresponds to the controlled area of workshops therein to carry out the radiation work.

(2) Work rooms for handling radioactive substances.

(3) Workshops therein to carry out work as listed in item 7 of Attached Table 2 of the Cabinet Order.

(Measurement, etc., of Dose Equivalent Rate)

Article 54. The employer shall periodically measure the dose equivalent rate or dose equivalent due to the external radiation in the controlled area designated in item 1 of the preceding article by using radiation measuring instrument at least monthly (at least in every 6 months where the stationary radiation equipment is provided with the fixed shield or where the radiation equipment is loaded with the radioactive substance of less than 3.7 GBq) and record the following matters for each measurement and file for at least five years.

(1) Time and date of measurement.

(2) Method of measurement.

(3) Kind, type and performance of radiation measuring instrument.

(4) Measured parts.

(5) Conditions of measurement.

(6) Result of measurement.

(7) Name of measurer.

(8) Outline of the measures taken according to the result of the measurement.

2. Notwithstanding the provision of the preceding paragraph, the dose equivalent rate and dose equivalent set forth in the preceding paragraph may be determined by calculation where measurement by the measuring instrument is extremely difficult.

3. The measurements specified in paragraph 1 or the calculations specified in the preceding paragraph shall be made for a 1-cm dose equivalent rate or 1-cm dose equivalent. However, in places where a 70-micrometer dose equivalent rate may exceed 10 times the 1-cm dose equivalent rate, or a 70-micrometer dose equivalent may exceed 10 times the 1-cm dose equivalent among the controlled areas prescribed in item 1 of the preceding article, the same shall be made for the 70-micrometer dose equivalent rate or the 70-micrometer dose equivalent as well.

4. The employer shall inform workers who enter the controlled area of the result of the measurement provided for in paragraph 1 or the result of calculation provided for in paragraph 2 by posting it, etc., in an easily visible location.

(Measurement of Concentrations of Radioactive Substances)

Article 55. In terms of the workshops as provided for by item 2 or 3 of Article 53, the employer shall make measurements of contaminations of radioactive substances in the air periodically, once at an interval which is shorter than a month by radiation measuring instruments, and shall make records on the matters as given in the respective items of paragraph 1 of the preceding Article and keep the records in custody for a period of five years.

Chapter VIII. Medical Examination

(Medical Examination)

Article 56. The employer shall periodically provide medical examinations by a medical doctor of the following checkup items to those workers who regularly engage in the radiation work and enter the controlled area, at the time of employment, before the transfer to the said work, and then periodically in every six months.

(1) Previous exposure (The place, kinds and duration of exposure and the impairment caused by the exposure to the radiation and the presence of subjective symptoms and other effects of the exposure shall be checked for those who have experienced exposure previously.)

(2) Examination of white blood cell count and white blood cell percentage.

(3) Examination of red blood cell count, hemoglobin content and hematocrit value.

(4) Examination of eyes for cataracts.

(5) Dermatological examination.

2. Among the checkup items in the preceding paragraph, those prescribed in item 4 of the paragraph may be omitted depending on the type, etc., of radiation sources used with respect to medical examinations required at the time of employment or reassigned to said work.

3. All or some of the checkup items 2 to 5 to be carried out periodically in the medical examination in the preceding paragraph 1 may be omitted if deemed unnecessary by the physician.

4. Notwithstanding the provisions prescribed in paragraph 1, medical examinations for workers whose effective dose exposure does not exceed five mSv over the one year ending on the day that the medical examination specified in the same paragraph (limited to those to be carried out periodically; hereinafter the same in this paragraph) is scheduled to be carried out, and also whose effective dose exposure is unlikely to exceed five mSv over the following one year starting on the day that said medical examination is scheduled to be carried out, shall not require the inclusion of items 2 through 5 if deemed unnecessary by the physician.

5. At the time of the medical examination under the provisions of paragraph 1, the employer shall submit data showing the dose to which said workers have been exposed since the last medical examination to the physician (or the necessary data to estimate the dose in case such volumes cannot be derived by calculation [e.g., the necessary data to describe the situation in which said workers have been exposed to said radiation in case such data is not available]).

(Recording of Results of Medical Examinations)

Article 57. The employer shall prepare the Individual Ionizing Radiation Medical Examination Cards (Form No.1) based on the results of the medical examinations provided for by paragraph 1 of the preceding Article (including medical examinations received by workers under the proviso of paragraph 5 of Article 66 of the Law and called the "Ionizing Radiation Medical Examination" in the following Article and Article 59) and keep the cards for a period of 30 years. However, it is not applied when the employer hands over those Individual Ionizing Radiation Medical Examination Cards to the institutions designated by the Minister of Health, Labour and Welfare after the custody for 5 years.

(Hearing the Views of the Physician Concerning the Results of the Medical Examination)

Article 57-2. Under the provisions of Article 66-4 of the Law, the views of the physician based on the results of the ionizing radiation medical examination shall be heard in compliance with the following stipulations:

(1) Within three months of the date when the ionizing radiation medical examination was carried out (where the proviso of paragraph 5 of Article 66 of the Law applies, the date when said worker submitted the document showing the results of the medical examination to the employer).

(2) The views of the physician shall be recorded on the Individual Ionizing Radiation Medical Examination Cards.

(Reports on Results of Medical Examinations)

Article 58. When the employer has medical doctors carry out medical examinations, as provided for by paragraph 1 of Article 56, (restricted only to those done periodically), he shall submit without delay the Report on the Results of the Medical Examinations on Ionizing Radiation (Form No. 2) to the Chief of the competent Labour Standards Inspection Office.

(Measures based on Medical Examination, etc.)

Article 59. In terms of those in whom there have occurred radiation hazards or if there is doubt about the development of the said hazards, or there may occur the said

hazards, when judged there is no possibility of doubt and fear, the employer shall assume measures necessary for maintenance of health of those individuals, thereby to change the working place or the type of work, shorten the periods of time for which the said ones, change working methods into new ones, etc.

Chapter IX. Miscellaneous Provisions

(Installation of Radiation Measuring Instruments)

Article 60. The employer shall install radiation measuring instruments concerning radiation to carry out the duties as provided for by this Ministry of Health, Labour and Welfare Ordinance, provided that this shall not apply in respect to a case in which he assumes measures thereby to easily make use of the said instruments when necessary.

(Notification concerning Gamma-Ray Radiation Equipment for Transmissive Photography)

Article 61. When the employer has workers engage in work with gamma ray radiation equipment for transmissive photography at places other than his workplace, he shall submit to the Chief of the competent Labour Standards Inspection Office the notification (Form No. 6) together with drawings showing the controlled area along with a sketch of the vicinity, in which the said work is carried out, before the said work is started.

(Application to Other Cases)

Article 62. The provisions of paragraph 4 of Article 3 (including the applications to the cases of the provisions of paragraph 3 of Article 15, paragraph 2 of Article 22, paragraph 3 of Article 33 and paragraph 2 of Article 36), paragraph 3 of Article 7, Article 8, Article 9, the text of paragraph 1 of Article 18 (including the applications to the cases of the provisions of paragraph 2 of same Article), Articles 31 and 32, paragraph 1 of Article 33, paragraph 1 of Article 34, paragraph 1 of Article 35, paragraph 1 of Article 36, Article 38, 39 and 41, Article 41-2, paragraphs 1 and 3 of Article 42, Article 44, paragraph 1 of Article 45 and paragraph 4 of Article 54 shall be applicable with necessary modifications to the cases of the employer undertaking work other than the radiation work and its employees within the working place where the radiation work is performed.

Attached Table (Refer to Articles 3, 28, 29, 30, 31, 32, 33, 39, 41 and 44)

Limits on Surface Contamination

Classification	Restriction (Bq/cm^2)
Radioisotopes emitting alpha-rays	4
Radioisotopes not emitting alpha-rays	40

Remarks: Unit of restriction Bq/cm^2: Becquerels per square centimeter