

**Pakistan Nuclear Safety
& Radiation Protection Regulations
1990**

**(Consolidated after incorporating all the amendments, replacements,
additions and repeals till October 5, 2004)**

**Directorate of Policies and Procedures
Pakistan Nuclear Regulatory Authority
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In the name of ALLAH the most gracious and the most merciful

PAKISTAN ATOMIC ENERGY COMMISSION

Pakistan Nuclear Safety & Radiation Protection Regulations, 1990

S.R.O. 957(I)/90 --In exercise of the powers conferred by Section 8 of the Pakistan Nuclear Safety and Radiation Protection Ordinance, No.IV of 1984, the Pakistan Atomic Energy Commission is pleased to make and promulgate the following Regulations-

1. **Short title, extent and commencement.**--(1) These regulations may be called the Pakistan Nuclear Safety and Radiation Protection Regulations, 1990.

- (2) These regulations extend to the whole of Pakistan.
- (3) These regulations shall come into force at once.
- (4) These regulations shall also apply to all the establishments of the Commission.

(Regulation 2 repealed vide PAK/904)

3. **Fixation of date.**---(1) The date of notification of these regulations in the Gazette of Pakistan is hereby fixed as the date for the commencement of Licensing under Section 5 of the ordinance provided that the Licensing of X-ray machines shall commence from 1st day of January 1992.

4. **Power to determine nuclear substance.**--(1) The Director shall have the power and authority to determine and declare, from time to time that any substance or material including any substance obtained or obtainable from the soil, water, or from the atmosphere, which may be used for production of or use in atomic energy or for research into matters connected therewith, whether or not otherwise radioactive, is nuclear substance for the purposes of the ordinance and the regulations.

(2). Natural uranium, depleted uranium, enriched uranium, thorium, plutonium, zirconium, heavy water, tritium and beryllium are hereby determined and declared to be substances which are used for production of or use in atomic energy and shall for all intents and purposes be deemed to fall within the expression "nuclear substance".

5. **Delegation of powers.**--(1) All the powers and functions of the Commission under the ordinance and these regulations shall be exercisable by the Director, provided that the power to make regulations shall not be deemed to have been delegated.

(2). The powers to appoint the advisory committees and to lodge the complaints shall be exercised by the Director with the prior approval of the Chairman.

6. **Designation of Inspectors.**--(1) The following officers shall be Inspectors for whole of Pakistan.

- (a) Director:
- (b) Any other officer designated by the Director to be an Inspector.

(2) An Inspector may be designated for a particular place or area or for specific purpose or the period.

(3) The Inspector shall carry with him a valid identity card of such designation, issued by the Directorate and if so required, he shall show his identity card for identification to any person, in relation to whom he is exercising or proposing to exercise any of his powers.

7. Powers of the Inspectors-- An Inspector may---

(a) carry out periodic inspection of the licensed premises/installation or radiation apparatus and submit a report to the Director.

(b) record the statement of any person in the performance of his duties.

8. Assistance to the Inspectors.--Every licensee and any other person acting for or under him shall be bound to assist and provide all relevant facilities, data, records, information and full access to the necessary areas to the Inspector in performance of his duties and functions without any obstruction, hindrance or delay.

9. Loss of radioactive material etc.-- (1)Where, in the opinion of an Inspector--

(a) any loss, theft, or destruction of any radioactive material or radiation apparatus has occurred or the same has fallen into the possession of some unauthorized person or is so suspected;

(b) a nuclear incident or radiation accident has taken place and has caused or is likely to cause the increase of normal radiation levels,

(c) a violation of any provision of the ordinance, these regulations or of the terms and conditions of a licence has taken place:

he may direct any person whether holding the appropriate licence or not to submit a report pertaining to the circumstances of such loss, theft, occurrence or violation, as the case may be, alongwith any remedial action taken or proposed to be taken in respect thereof, and direct such other action to be taken as he deems necessary to remedy or to prevent the breach of these regulations or the terms and conditions of the licence or to minimize the consequences, if any, of the loss, theft, destruction, occurrence, violation, nuclear incident or radiation accident.

(2) If in his opinion a violation of the terms and conditions of the licence or breach of these regulations has taken place in any premises or nuclear installation, the Inspector may, with the approval of the Director order work to be stopped or suspended in the said premises or the nuclear installation, unless he is satisfied that the risk to the public, workers or the environment by the operation of the installation is not greater than that when the licence was granted.

(3) A person, who is given any direction or instruction by the Inspector in the execution of his duties, shall comply with such direction or requirement

(Regulations 10 to 17 repealed vide PAK/908)

18. **Record of licences.**--The Directorate shall maintain a record of licences in such form as it may deem fit.

19. **Confidential information.**--The information furnished to the Directorate in pursuance of any order, direction or requirement or in an application made in accordance with these regulations, shall be treated as confidential by the Directorate, and shall not be divulged except for purposes of prosecution, or when the Director himself considers it expedient in the interest of nuclear safety or radiation protection.

(Regulation 20 repealed vide PAK/908)

(21) **Variation of the orders passed.**--The Chairman may call for the records of any application for a licence, renewal or other proceedings pending or disposed of by the Director or any other officer of the Commission, suo moto or on information received, or representation made to him by an aggrieved applicant/ licensee and may--

(a) grant, revoke, suspend, or renew of licence, or change the terms and conditions of any licence;

(b) uphold, reverse or vary any orders passed on that record or may pass any further orders as he may consider appropriate.

(Regulations 22 and 23 repealed vide PAK/904)

(Regulation 24 repealed vide PAK/908)

25. **Disposal order by the court.**--If a person is convicted of an offence under the ordinance which was committed in respect of radioactive material, nuclear substance, radiation apparatus, or contaminated food and the court passes an order for such radioactive material, nuclear substance, radiation apparatus or contaminated food to be handed over to the Director for safe disposal, the Director shall dispose of the same as prescribed in the guidelines.

(Regulations 26 to 32 repealed vide PAK/904)

33. **Planned special exposure for exceptional situations.**--(1) The dose equivalents or the committed dose equivalents incurred in the course of planned exposures shall not exceed twice the relevant annual limit specified in Schedule-III in any single event, and in a lifetime five times this limit.

(2) The licensee shall authorize in writing a planned special exposure only in an exceptional situation.

(3) The licensee shall inform the workers of the estimated radiation doses and potential occupational hazards during the planned operation.

- (4) The worker shall be instructed by the Radiation Protection Officer about the measures to be taken to keep the doses and other risks as low as reasonably achievable.
- (5) The licensee shall ensure that planned special exposures are not authorized for workers who have previously received abnormal exposures resulting in dose equivalents in excess of five times the relevant annual limit and workers who are women of reproductive capacity.
- (6) The licensee shall inform the worker, the approved medical practitioner and to the Director, the dose equivalents or the committed dose equivalents resulting from planned special exposure.
- (7) Planned special exposure for operations involving inhalation risk of radioactive substances, shall be avoided.
- (8) Dose equivalents or the committed dose equivalents resulting from planned special exposure shall be recorded with those from normal exposures, but any excess over the limits prescribed in Schedule-III for radiation workers shall not in itself constitute a reason for removing the worker from his occupation.

(Regulations 34 to 38 repealed vide PAK/904)

39. **Reference levels.**--(1) Reference levels shall be as follows--
- (a) recording level shall be for dose equivalents or effective dose equivalents or intake above which the information is of interest from a radiation protection point of view;
 - (b) investigation levels shall be for dose equivalents or effective dose equivalents or intakes above which, in the opinion of the Directorate, further investigations are justified;
 - (c) intervention levels shall be specified in advance for abnormal situations by licensee with the approval of the Director; and
 - (d) a reference level shall be established by the licensee, with approval of the Director, for any quantity used in radiation protection where limit for the quantity does not exist.
- (2) The level of three-tenths of the dose limits for individual workers aged 18 years and above shall be used as a reference level for administrative classification of conditions of work.
40. **Limitation of radiation exposures (abnormal conditions).**--Radiation emergency plan shall be prepared by the licensee with the approval of the Director which shall include--
- (a) a description of the hierarchy of command for dealing with the emergency;

- (b) an outline of the lines of communication within the facility and with appropriate national, international authorities and the public;
- (c) an outline of the special monitoring needed to assess the situation;
- (d) an indication of the various counter-measures available for minimizing exposures and an explanation of the effectiveness and consequences of these measures under different conditions;
- (e) a general description of the manpower and material resources including sufficient funds necessary to effect such counter-measures;
- (f) the description of intervention levels and derived intervention levels and derived intervention levels;
- (g) provisions for demonstrating the efficiency of the planned counter measures;
- (h) provisions for special monitoring and data collection following the accident; and
- (i) any other provisions considered necessary by the Director.

41. **Actions to be taken following abnormal exposure.**--(1) Where individual workers are seriously exposed or contaminated as a result of abnormal situations, there shall be taken the following actions, namely--

- (a) collecting dosimeters and information that will help in estimating doses and intakes;
 - (b) obtaining, as appropriate, excreta sample for bio- assay;
 - (c) initiating medical tests and making subsequent diagnosis;
 - (d) collecting information about the circumstances of the accident.
- (2) (a) causes and consequences of doses or intakes to workers incurred during abnormal events shall be subject to investigations;
- (b) an occupationally exposed worker incurring a dose or intake of radioactive material, exceeding twice the annual limit, shall be referred for appropriate medical examination by the approved medical practitioner;
 - (c) the administrative arrangements to be made following an accident shall include decision for any restriction on the future occupational exposure of those involved in the event. The worker shall still be allowed to continue routine work if there is no objection from the medical standpoint, due account having been taken of previous exposures, health, age, special skills as well as social and economic responsibilities;
 - (d) all emergency and accidental doses and emergency and accidental intakes shall be recorded together and clearly distinguished from normal exposure.

(3) In case an exposure in excess of the dose limits occurs, or is suspected to have occurred, an investigation shall be made of the circumstances in which the exposure took place, and the results shall be reported by the management to the Director.

42. **Abnormal exposure to members of the public and countermeasures.--(1)**

Any accident involving the exposure of the population to abnormal levels of radiation shall be immediately reported by the management of the installation to the Director.

(2) The measures to mitigate the consequences of an accident shall be taken by the management in consultation with the Directorate.

(Regulation 43 repealed vide PAK/904)

44. **Duties of the physical surveillance service.--**The physical surveillance service shall provide--

(a) facilities located within the site for the de- contamination of personnel, equipment and areas;

(b) all persons who carry out remedial actions, with individual dosimeters, suitable protective clothing and respiratory protective equipment as appropriate to the situation;

(c) sufficient quantities of various protective equipments, readily available to meet at least the minimum requirements foreseen in the emergency plan;

(d) high range radiation monitoring instruments including dose rate instruments with or without a warning signal, battery operated air samplers; and

(e) in selected areas, pre-installation of fixed monitoring instruments with high level detection capabilities for rapid assessments of an emergency situation.

(Regulations 45 to 57 repealed vide PAK/904)

58. **Storage of radioactive material.--(1)** The licensee shall provide adequate facilities for storage of any radioactive material within his possession in such a manner that--

(a) special containers and secure places approved by the Radiation Protection Officer are used;

(b) it is kept away from inflammable substances;

(c) no person is exposed to radiation resulting in doses in excess of the authorized limits; and

(d) in the event of any breakage or rupture of the container, its entire contents are retained in appropriately designed receptacle.

(2) Every container used for storage of any radioactive material shall have affixed to it in addition to the symbol of ionizing radiation, a label indicating--

- (a) nature and activity of the contents:
- (b) date measurement of activity;
- (c) name of the person in charge of container; and
- (d) special safety instructions.

59. **Record Keeping of Radioactive Material.**--(1) Records of the radioactive materials as stored shall be kept by the licensee in a form and in a manner prescribed by the Directorate.

(2) The storage site shall be adequately protected to be inaccessible to unauthorized personnel.

60. **Radioactive waste disposal.**--(1) The licensee shall follow the guidelines to be issued by the Directorate for management and disposal of radioactive waste.

(2). The licensee shall take such measures to ensure that no authorized limits as laid down in these regulations or in the operating licence are exceeded.

61. **Authorization for radioactive waste disposal.**--The Directorate shall examine and approve the methods proposed by the licensee for waste disposal.

62. **Transport of radioactive material.**-- The transport of radioactive material shall be regulated by the guidelines issued by the Directorate.

63. **Additional Requirements.**--During the transport of radioactive materials any other hazardous characteristics of these materials such as explosiveness, inflammability, phrophoricity, chemical toxicity and corrosiveness shall be taken into account in such a manner as to be in conformity with the regulations already in force for the transport of dangerous goods.

64. **Radiation Protection in mining and milling of radioactive ores.**--The licensee shall carry out all activities related to the development, excavation, production, processing and handling of radioactive ores and other prescribed substances in accordance with--

- (a) The guidelines issued by the Directorate; and
- (b) instructions and supervision of a Radiation Protection Officer.

(Regulations 65 to 69 repealed vide PAK/904)

70. **Physical protection of nuclear material and nuclear facilities.** – The licensee shall be responsible to organize and ensure the physical protection of the nuclear material in use and storage and during transport and of nuclear facilities, including radioactive

waste belonging to these facilities in accordance with the provisions of these regulations and guidelines to be issued by PNRB from time to time.

Addition of Regulation No. 70 vide S.R.O.1406 (I)/98 dated 22 December 1998 in the Gazette of Pakistan published on 31 December 1998 (page 2575).

SCHEDULE-I

LICENSING AND RENEWAL FEE

No.	Facility	License fee (Rupees)	Annual renewal fee (Rupees)
1.	<p>Full-fledged medical centre which include:</p> <p>a. Radiotherapy centre where radiation apparatus such as Linear Accelerator, Betatron, Cobalt-60, Cesium-137, Deep X-ray therapy etc., are installed.</p> <p>b. Nuclear Medical Centre, where diagnostic apparatus such as Gamma Camera, Linear Scanner, RIA equipment etc., are installed.</p>	150,000	75,000
2.	Radiotherapy Centre or Nuclear Medical Centre or Nuclear Cardiology Centre.	100,000	50,000
3.	Laboratory used for Radio-Immuno-Assay(tests), research, teaching etc.,	20,000	10,000
4.	<p>X-ray machine used for diagnosis in clinics, hospitals, nursing homes etc., having tube current of:</p> <p>50 mA or less</p> <p>From 51 mA to 200 mA</p> <p>From 201 mA to 500 mA</p> <p>More than 500 mA</p> <p>C.T. Scanner</p>	<p>1,000</p> <p>2,000</p> <p>3,000</p> <p>5,000</p> <p>10,000</p>	<p>500</p> <p>1,000</p> <p>1,500</p> <p>2,500</p> <p>5,000</p>
5.	X-ray therapy unit	10,000	5,000
6.	Industrial Radiography unit and other related facility such as gas mantle manufacturer, oil well logging etc.,	75,000	37,500
7.	<p>Nuclear power plant:</p> <p>a. Construction license</p> <p>b. Operating license per unit</p>	<p>60,000,000</p> <p>75,000,000</p>	<p>6,000,000</p>
8.	<p>Nuclear research reactor</p> <p>a. Construction license</p> <p>b. Operating license per unit</p>	<p>2,100,000</p> <p>3,300,000</p>	<p>300,000</p>
9.	<p>Nuclear fuel enrichment & fabrication facility:</p> <p>a. Construction license</p> <p>b. Operating license per unit</p>	<p>24,000,000</p> <p>30,000,000</p>	<p>3,000,000</p>

No.	Facility	License fee (Rupees)	Annual renewal fee (Rupees)
10.	Mining & Milling facility a. Construction license b. Operating license per unit	2,880,000 3,600,000	600,000
11.	Conversion facility a. Construction license b. Operating license per unit	4,800,000 6,000,000	1,500,000
12.	Waste repository operating license Construction license Operating license per unit	14,400,000 18,000,000	600,000
13.	Entry into Pakistan and stay of nuclear powered vehicle per visit per week or part of week thereof	100,000	
14.	Food irradiation facility and sterilization of medical products facility.	100,000	50,000
15.	Importers/exporters/manufacturers of radioisotopes/ radiation apparatus	50,000	25,000
16.	License amendment fee	Half the amount of the renewal fee of that license.	
17.	Re-license of nuclear installation (para 7 to 12)	To be decided by PNRA on case to case basis, but in any case not less than fifty percent (50%) of the current fee for issuance of an operation license.	
18.	Any type of license not covered above	To be decided by PNRA on case to case basis.	

LATE PAYMENT

The fees described above are for calendar year January-December, and are due on 1st January of each year. In case of late payment of license renewal fee, the following schedule shall apply.

1.	Renewal fee credited to PNRA account in the month of February	Renewal fee + 5% of the renewal fee as surcharge in the year in which it falls due
2.	Renewal fee credited to PNRA account in the month of March	Renewal fee + 10% of the renewal fee as surcharge in the year in which it falls due
3.	Renewal fee credited to PNRA account in the month of April	Renewal fee + 20% of the renewal fee as surcharge in the year in which it falls due
4.	Renewal fee credited to PNRA account in the month of May	Renewal fee + 30% of the renewal fee as surcharge in the year in which it falls due
5.	Renewal fee credited to PNRA account in the month of June	Renewal fee + 40% of the renewal fee as surcharge in the year in which it falls due

Thereafter, cases of non-payment of license renewal fee will be dealt as per section 44 of the Ordinance III of 2001 dated 22nd January 2001.

Amendment of schedule 1 vide S.R.O. 901(I)/2003 dated 10 September 2003 published in The Gazette of Pakistan on 11 September 2003. (pages 2 134-2136).

(Schedule II to XVI repealed vide PAK/904)