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PART II

**Statutory Notification (S.R.O.)**

GOVERNMENT OF PAKISTAN

**PAKISTAN NUCLEAR REGULATORY AUTHORITY**

NOTIFICATIONS

*Islamabad, the 12th of June, 2012*

**S.R.O. 798(I)/2012** -In exercise of the powers conferred by section 56 and section 16(2)(a) of the Pakistan Nuclear Regulatory Authority Ordinance 2001, Pakistan Nuclear Regulatory Authority is pleased to make and promulgate the following Regulations-

1. **Short title, extent and commencement.** - (1) These regulations may be called "Regulations for Licensing of Nuclear Installations in Pakistan-PAK/909 (Rev. 1)".
- (2) These regulations shall come into force at once.
- (3) These regulations extend to the whole of Pakistan.
- (4) These regulations shall supersede "Regulations for licensing of Nuclear Installations in Pakistan-PAK/909 (Rev. 0)

(3819)

2. **Definitions.** -In these regulations, unless there is anything repugnant in the subject or context,
- (a) "Applicant" means a legal person who applies to the Authority for obtaining an authorization or a license to undertake specified activities.
  - (b) "Commissioning" means the process during which components and systems of a nuclear installation, having been constructed, are made operational and verified to be in accordance with design and to have met the performance criteria.
  - (c) "Construction" means the process of manufacturing and assembling the components of a nuclear installation, the carrying out of civil works, the facility of the components and equipment and the performance of associated tests.
  - (d) "Construction license" means the authorization issued by the Authority which allows the licensee to pour concrete in any nuclear safety related structure and/or to start manufacturing of any component or equipment of systems important to nuclear safety.
  - (e) "Closure" means Administrative and technical actions directed at a repository at the end of its operating lifetime e.g. covering of the disposed waste (for a near surface repository) or backfilling and/or sealing (for a geological repository and the passages leading to it) — and the termination and completion of activities in any associated structures.
  - (f) "Decommissioning" means administrative and technical actions taken to allow the removal of some or all of the regulatory controls from an installation (except for a repository or for certain nuclear installation(s) used for the disposal of residues from mining and processing of radioactive materials, which are closed and not decommissioned).
  - (g) "Design" means the process and the result of developing a concept, detailed plans, supporting calculations and specifications for a nuclear installation(s) and its parts.
  - (h) "Incident" means any unintended event, including operating error, equipment failures or other mishaps, the consequences or potential

consequences of which are not negligible from the point of view of protection and safety. .

- (i) "Inspection" means an examination, observation, measurement or test undertaken to assess structures, systems, components and materials, as well as operational activities, technical and organizational processes, procedures and personnel competence.
- (j) "Inspector" means an officer designated by a general or specific order of the Authority to perform such functions as prescribed by section 29 of the Ordinance.
- (k) "Licensee" means the holder of current license.
- (l) "Limit" means the value of quantity used in certain specified activities or circumstances that must not be exceeded and is acceptable to or/and notified by the Authority.
- (m) "Nuclear installation" means:
  - i) any nuclear reactor used as a source of power or for any other purpose;
  - ii) any factory using nuclear fuel for the production of nuclear material, or any factory for the processing of nuclear material including any factory for the reprocessing of irradiated nuclear fuel;
  - iii) any facility where nuclear material or spent fuel is stored other than storage incidental to the carriage of such material; or
  - iv) any radioactive waste management facility.
- (n) "Nuclear fuel cycle" means all the operations associated with the production of nuclear energy, including:
  - i) Mining and processing of uranium or thorium ores;
  - ii) Enrichment of uranium;
  - iii) Manufacture of nuclear fuel;
  - iv) Operation of nuclear reactors (including research reactors);
  - v) Reprocessing of spent fuel;
  - vi) All waste management activities (including decommissioning) relating to operations associated with the production of nuclear energy;

- vii) Any related research and development activities.
- (o) "Nuclear safety (safety)" means the achievement of proper operating conditions, prevention of accidents or mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation hazards.
- (p) "Operating license" means the license issued by the Authority for the operation of a nuclear installation.
- (q) "Operation" means all activities performed to achieve the purpose for which a nuclear installation is constructed. These include maintenance, refueling, in-service inspection and other associated activities.
- (r) "Ordinance" means Pakistan Nuclear Regulatory Authority Ordinance No. III of 2001.
- (s) "Periodic Safety Review (PSR)" means a systematic reassessment of the safety of an operational installation carried out at regular intervals to deal with the cumulative effects of ageing, modifications, operating experience, technical developments, and siting aspects, and aimed at ensuring a high level of safety throughout the operating lifetime of the installation.
- (t) "Probabilistic Safety Assessment (PSA)" means a comprehensive, structured approach to identifying failure scenarios, constituting a conceptual and mathematical tool for deriving numerical estimates of risk.
- (u) "PSA level-1" means the full scope assessment of plant failure leading to the determination of core damage frequency. This shall include an assessment of internal initiating events in full power operating conditions, low power and shutdown modes, internal and external hazards such as fire, flood and earthquakes etc.
- (v) "Quality assurance" means all those planned and systematic actions necessary to provide adequate confidence that an item, process or service will satisfy the given requirements for quality, for example, those specified in the license.

- (w) "Radioactive waste" means waste that contains, or is contaminated with, radio nuclides at concentrations or activities greater than clearance levels as established by the Authority.
- (x) "Site" means the geographical area containing the nuclear installation(s), and within which the management of the installation(s) may directly initiate emergency actions.
- (y) "Siting" means the process of selecting a suitable Site for a nuclear installation(s), including appropriate assessment and definition of the related design bases.
- (z) "Site personnel" mean all persons working in the site area of the authorized installation(s), either permanently or temporarily.
- (aa) "Site registration" means the authorization issued by the Authority to an applicant to allow preparation of site for the construction of a nuclear installation.
- (bb) "Testing" means the determination or verification of the capability of an item to meet specified requirements by subjecting the item to a set of physical, chemical, environmental or operational conditions.

**3. Scope.-** (1) These regulations shall apply to the licensing of nuclear installations including nuclear power plants, research reactors, spent fuel storage facilities, waste management facilities etc.

**4. Interpretation. -** (1) The decision of Chairman regarding the interpretation of any word or phrase of these regulations or applicability of these regulations shall be final and binding upon the applicant and licensee.

**5. General. -** (1) The licensee shall be directly responsible for the safety of its nuclear installation(s). To this end, the licensee shall:

- (a) comply with national laws and technical standards to ensure the safety of the nuclear installation(s);
- (b) be subject to regulatory supervision of the Authority and to report promptly the actual safety condition in case of nuclear incidents;
- (c) seek permission of the Authority for transporting nuclear/radioactive material to/from a nuclear installation.

(2) A separate licence shall be required for establishment of independent spent fuel storage or a pre-disposal radioactive waste management installation in case the

installation is not covered under license of any operating nuclear power plants or a research reactor.

(3) No licensee shall transfer or assign a license to any other person without the prior approval of the Authority.

(4) The applicant/licensee shall submit fifteen copies of each document and/or report, at least eight (08) of which shall be hard copies, duly signed by the applicant or his authorized agent to the Authority. The submission requirements are specified in different sections and Appendices of these Regulations. The Appendices related to different nuclear installations are described below:-

(a) Appendix-I for licensing of nuclear power plants & research reactors.

(b) Appendix-II for licensing of other nuclear fuel cycle facilities

(5) The Authority may also require the applicant/licensee to submit any other relevant document/information at any stage during the licensing process.

(6) The application for acquiring an authorization/license shall be accompanied by such fee as prescribed by the "Regulations on Licensing Fee by Pakistan Nuclear Regulatory Authority - (PAK/900).

**6. Interface.** - (1) Except where otherwise specified, all communications and reports concerning these regulations shall be addressed to Chairman or an officer duly authorized on his behalf.

(2) The applicant/licensee shall keep the Authority informed of the schedule and progress of its activities during all phases of nuclear installation(s) such as siting, design, construction, commissioning, operation, and decommissioning/closure.

**7. Issuance of Authorization or a Licence.** - (1) On the basis of the safety reviews performed by the Authority and all other information that the Authority may have, the decision will be made regarding issuance of the authorization/Licence or otherwise. The Authority may attach such terms and conditions to the authorization/Licence as deemed necessary.

(2) The authorization/licence issued by the Authority shall remain valid for the duration specified in the license subject to:

(a) compliance with the requirements of sections 10 and 11 of these regulations, terms and conditions of the license or authorization, and any

other requirements as may be formally notified by the Authority from time to time; and

- (b) payment of such annual renewal fee as may be prescribed by the PNRA regulations.

**8. Authorization and Licensing Process.** - (1) The applicant shall notify in writing to the Chairman of his intention to establish and operate the nuclear installation.

(2) The authorization/licensing process shall consist of the following stages, detailed in sub-sections 8(3) to 8(11):

- (a) Site Registration
- (b) Construction License
- (c) Permission for Commissioning
- (d) Permission to Introduce Nuclear Material into the Installation
- (e) Operating License
- (f) Revalidation of Operating License
- (g) Licensing Beyond Design Life
- (h) License for Decommissioning of a Nuclear Installation or Closure of a Waste Repository
- (i) Removal from Regulatory Control

(3) Site Registration:

- (a) The applicant shall submit an application to the Authority for the registration of site for nuclear installation alongwith the following documents:
  - i) Site Evaluation Report (SER)
  - ii) No Objection Certificates (NOC) from relevant departments of the federal, provincial and/or local governments
  - iii) Quality Assurance Program applied during site evaluation for reference and record.
- (b) On approval of SER, the site will be registered which will allow preparation of the site for construction of nuclear installation.

(4) Construction License:

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- (a) After registration of the site, the applicant shall establish design and safety criteria in accordance with the nuclear safety standards specified in clause 10 of these regulations and submit the same for approval of the Authority.
- (b) After completion of the preliminary design, the licensee shall submit the documents indicated in the relevant Appendix to the Authority for issuance of construction license.
- (c) On approval of these documents the construction license may be issued by the Authority. The applicant shall not begin the construction of nuclear installation on the site until a construction license has been issued. The pouring of the concrete in the foundation shall be deemed to be the beginning of construction.
- (d) The construction license shall normally be valid for a period of 10 years or as specified in the license.
- (e) After the expiry of construction license, the construction activities may only continue/commence after revalidation of the construction license. The licensee shall submit a request to the Authority for revalidation of the construction license alongwith the following documents:
- i) Updates of all the documents and reports submitted for the grant of construction license
  - ii) Reasons for the delay alongwith justification for continuing/commencing the construction
  - iii) An evaluation of the impact in design as a result of changes such as changes in the design, nuclear safety standards, industrial standards, experience feedback.
- (f) In case the licensee is unable to start construction of the nuclear installation within a period of five (05) years after the issuance of construction license, the same shall be deemed to have been cancelled. In such a case, the applicant shall have to re-submit the case for issuance of construction license.
- (5) Permission for Commissioning:
- a) At least six months before the proposed starting date of commissioning of the installation, the licensee shall submit a request



for permission of commissioning alongwith the commissioning program and quality assurance program for the commissioning phase.

- b) Upon approval of the commissioning program, the Authority may allow commissioning without introducing nuclear material into the system of the installation.

(6) Permission to Introduce Nuclear Material into the Installation:

- (a) After completion of the detailed design and the safety analysis, the licensee shall apply for permission to introduce nuclear material into the system of the installation, where applicable, alongwith the documents listed in the relevant Appendix within the specified time frame.
- (b) On approval of these documents and demonstration of the implementation of Emergency Preparedness Plans and Physical Protection Program in drills/exercises, permission to introduce nuclear material into the systems of nuclear installation may be granted by the Authority to complete nuclear commissioning and perform subsequent operation until the issuance of Operating License subject to the availability of the required number of licensed/authorized operating personnel.

(7) Operating License:

- (a) Within six months after completion of the commissioning, the licensee shall apply for the Operating License and shall submit the documents given in relevant Appendix.
- (b) On acceptance of reports, results and documents mentioned in the relevant Appendix, the Operating License may be granted by the Authority subject to the availability of required number of licensed operating personnel.
- (c) The Operating License shall normally be valid for a period up to a maximum of ten (10) years.

(8) Revalidation of Operating License:

- (a) During the design life of the nuclear installation and at least one year before the expiry of Operating License, the licensee shall apply for

revalidation of the license alongwith the documents mentioned in relevant Appendix of these Regulations.

- (b) On approval of these documents, the Operating License may be revalidated by the Authority for another period up to a maximum of ten (10) years.

(9) Licensing Beyond Design Life:

- (a) In case the licensee intends to operate the nuclear installation beyond its design life he shall apply at least three (03) years before the end of design life alongwith the documents listed in the relevant Appendix of these regulations
- (b) On approval of these documents the Authority may grant license to operate the nuclear installation beyond its design life for the duration requested in the application or as determined by the Authority.

(10) License for Decommissioning/Closure of the Installation:

- (a) In case the licensee intends to permanently shutdown/close the installation, he shall apply for decommissioning/closure at least three years before terminating the operation of the nuclear installation. The application shall accompany the documents mentioned in relevant Appendix.
- (b) Upon approval of these documents, the Authority may terminate the Operating License and issue license for decommissioning/closure of the installation.

(11) Removal from Regulatory Control:

- (a) After the completion of all decommissioning activities to the satisfaction of the Authority and restoring the site to condition such that the site can be used for any other purposes, the licensee may apply for removal of the installation from regulatory control. The application shall accompany a "Decommissioning Completion Report" and "Final Radiological Survey Report".
- (b) Upon approval of these documents by the Authority and satisfaction that no potential for radiation hazard exists for using the site for any

other purposes, the site may be removed from the regulatory control of the Authority.

**9. Amendment in Authorization/Licence** – (1) The holder of an authorization or a license intending to incorporate a modification which may lead to changes in the existing design/licensing basis of the installation, shall submit an application to the Authority for amendment in the license. The application shall accompany the documents fully describing the desired changes, safety analysis and justification for the modification alongwith parts of the revised safety analysis report.

(2). Upon approval of the submissions, the Authority may amend the authorization/licence. The licensee shall implement the modification only after the amendment of the license.

**10. Applicable Nuclear Safety and Security Standards** – (1) All nuclear installations, for the purposes of siting, design, construction, commissioning, operation and decommissioning/closure, shall conform to the existing PNRA regulations.

(2) In areas where the PNRA regulations are not available, relevant latest US Nuclear Regulatory Commission regulations shall be deemed to be applicable. Alternately, the licensee may choose to follow the latest revisions of the applicable IAEA Safety and Security Standards.

(3) In case the nuclear safety and security standards of another country are proposed to be followed, the applicant/licensee shall demonstrate to the entire satisfaction of the Authority that the standards, proposed to be followed, offer the same or better standards of safety, security, quality and reliability than would have been offered by the nuclear safety and security standards mentioned in clauses 10(1) and 10(2) of these regulations.

**11. Inspections** - (1) The licensee shall submit its detailed program of how it intends to inspect various activities during siting, manufacturing, construction, commissioning, operation and decommissioning/closure of the nuclear installation prior to starting the activity. Thereafter, the Authority may provide its regulatory inspection program to the licensee.

(2) The Authority may send inspector(s) to the sites to perform the following functions:

- (a) to inspect whether the information submitted relating to safety is in conformity with the actual conditions;
  - (b) to ensure and verify that activities related to siting, construction, commissioning, operation and decommissioning/closure of the nuclear installation comply with PNRA regulations, licensing submissions approved by the Authority, and/or the terms and conditions of the authorization/licence;
  - (c) to exercise any other regulatory function.
- (3) The inspector(s) (which term shall also include third party personnel acting on behalf of the Authority) while performing their functions shall have the right of access to investigate and collect information related to safety and physical protection.
- (4) The Authority may also require its inspectors to visit the manufacturing works, where equipment for the nuclear installation is being fabricated, assembled, manufactured or tested. However, such visits will be by prior arrangement and advance notice to the licensee. All cost in this regard shall be borne by the licensee.

#### **APPENDIX-I**

##### (Nuclear Power Plants & Research Reactors)

The Appendix provides the list of documents that shall be submitted by the applicant during different stages of the licensing process for reference, record and approval (as the case may be) of the Authority and subsequent grant of various Authorizations/Licenses.

#### **1. Construction Licence:**

Before the proposed starting date of the construction, the licensee shall submit the following documents:

- (a) Preliminary Safety Analysis Report (PSAR)
- (b) Design Probabilistic Safety Assessment (PSA) of full power internal initiating events (for NPPs only)
- (c) Quality Assurance Program for design and construction phases (for reference and record)

**2. Permission to Introduce Nuclear Material in the Installation**

Before the proposed date of introducing nuclear material into the system(s) of the nuclear installation, the licensee shall submit an application for introduction of nuclear material alongwith the following documents:

- (a) Final Safety Analysis Report (FSAR)
- (b) Probabilistic Safety Analysis (PSA) Level-I (for NPPs only)
- (c) Physical Protection Program
- (d) Emergency Preparedness Plans
- (e) Radiation Protection Program
- (f) Environmental Monitoring Program
- (g) Radioactive Waste Management Program
- (h) Initial Decommissioning Plan
- (i) Pre-Service Inspection/In-Service Inspection Program
- (j) Quality Assurance Program for Operation

In addition, the following documents shall also be submitted alongwith the application for reference and record:

- (a) Programs for maintenance, testing, surveillance and inspection of structures, systems and components important to safety
- (b) Fire Protection Program

As the cold and hot commissioning (without introducing nuclear material in the systems) proceeds, the licensee shall regularly submit commissioning reports up to introduction of nuclear material to the Authority for information, reference and record.

**3. Operating License**

- (a) Results of the first start-up, criticality, low power tests, power ascension tests and full power tests;

- (b) Updates of all documents mentioned in section (2) of this Appendix on which amendments have been carried out.

4. **Revalidation of Operating License**

- (a) Latest report of Periodic Safety Review (PSR)

5. **Licensing Beyond Design Life**

- (a) Latest report of Periodic Safety Review (PSR).
- (b) Updates of all documents mentioned in section 3 (b) of this Appendix.

6. **License for Decommissioning:**

- (a) Final Decommissioning plan
- (b) Technical Specifications during decommissioning
- (c) Quality Assurance Program for decommissioning
- (d) Emergency Preparedness Plan
- (e) Physical Protection Program
- (f) Radiation Protection Program
- (g) Radioactive Waste Management Program
- (h) Environmental Monitoring Program

**APPENDIX-II**

(Licensing of other Nuclear Fuel Cycle Facilities)

This Appendix provides the list of documents that shall be submitted by the applicant during different stages of the licensing process for reference and record/approval of the Authority and subsequent grant of various Authorizations/Licenses

1) **Construction License**

Before the proposed starting date of the construction, the licensee shall submit the following documents:

- (a) Preliminary Safety Analysis Report (PSAR)
- (b) Quality Assurance Program for design and construction phases

**2) Permission to Introduce Nuclear Material in the Installation**

Before the proposed date of introducing nuclear material into the system of the nuclear installation, the licensee shall submit an application for introduction of nuclear material alongwith the following documents:

- (a) Final Safety Analysis Report (FSAR)
- (b) Physical Protection Program
- (c) Emergency Preparedness Plans
- (d) Radiation Protection Program
- (e) Radioactive Waste Management Program
- (f) Environmental Monitoring Program
- (g) Initial Decommissioning/Closure plan
- (h) Quality Assurance Program for Operation

In addition, the following documents shall also be submitted alongwith the application for reference and record:

- (a) Programs for maintenance, testing, surveillance and inspection of structures, systems and components
- (b) Fire Protection Program

**3) Operating License**

- (a) Commissioning reports
- (b) Updates of all documents mentioned in Section 2 of this appendix on which amendments have been carried out.

**4) Revalidation of Operating License**

- (a) Latest Periodic Safety Review (PSR)

**5) Licensing beyond design life (where applicable)**

- (a) Latest report of Periodic Safety Review (PSR).

(b) Updates of all documents mentioned in section 3(b) of this Appendix.

**6) License for decommissioning (where applicable)**

- (a) Final Decommissioning Plan
- (b) Technical Specifications during decommissioning
- (c) Quality Assurance Program for Decommissioning
- (d) Emergency Preparedness Plan
- (e) Physical Protection Program
- (f) Radiation Protection Program
- (g) Environmental Monitoring Program
- (h) Radioactive Waste Management Program

**7) Authorization for Closure (where applicable)**

- (a) Final Closure plan
- (b) Post Closure plan

[Ref PNRA-PPD-02 (09)/06.]

MOHAMMAD IQBAL,  
*Member (Corporate).*