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PART II

Statutory Notifications (S. R. O.)

GOVERNMENT OF PAKISTAN

PAKISTAN NUCLEAR REGULATORY AUTHORITY

NOTIFICATION

*Islamabad, the 17<sup>th</sup> September, 2016*

**S. R. O. 1196(I)/2016.**— In exercise of the powers conferred by Section-16(2)(a) read with Section-56 of the Pakistan Nuclear Regulatory Authority Ordinance, 2001 (III of 2001), the 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 on Decommissioning of Facilities Using Radioactive Material – (PAK/930)”.

(2) These regulations shall extend to the whole of Pakistan.

(3) These regulations shall come into force at once.

**2. Definitions.**—In these regulations, unless there is anything repugnant in the subject or context,

(a) “*characterization*” means determination of the nature and activity of radionuclides present in a specified place.

(b) “*critical group*” means a group of members of the public which is reasonably homogeneous with respect to its exposure for a given radiation source and is typical of individuals receiving the highest effective dose or equivalent dose (as applicable) from the given source;

(c) “*Chairman*” means Chairman of the Authority;

(d) “*decommissioning*” means administrative and technical actions taken to allow the removal of some or all of the regulatory controls from a facility (except for a repository or for certain nuclear facilities used for the disposal of residues from mining and processing of radioactive materials, which are closed and not decommissioned);

- (e) “*decommissioning plan*” means a document containing detailed information on the proposed decommissioning of a facility;
- (f) “*decontamination*” means the complete or partial removal of contamination by a deliberate physical, chemical or biological process;
- (g) “*deferred dismantling (sometimes called safe storage, safe store or safe enclosure)*” means the strategy in which all or parts of a facility containing radioactive material are either processed or placed in such a condition that they can be safely stored and the facility maintained until they can subsequently be decontaminated and/or dismantled;
- (h) “*dismantling*” means the disassembly and removal of any structure, system or component during decommissioning;
- (i) “*end state*” means a predetermined criterion defining the point at which a specific task or process (i.e. decommissioning) is to be considered completed; and
- (j) “*facilities*” means
  - (i) nuclear installations as defined in the PNRA Ordinance;
  - (ii) radiation facilities as defined in PNRA Regulations PAK/908.

**3. Scope.**— The provision of these regulations shall apply to all aspects of decommissioning of all facilities except radioactive waste disposal facilities and x-ray facilities.

**4. Interpretation.**— The decision of Chairman of the Authority regarding the interpretation of any word or phrase of these regulations or applicability of these regulations shall be final and binding on the licensee/applicant.

**5. General Responsibilities of the Licensee.**— (1) The licensee shall have the overall responsibility for decommissioning of its facilities. To this end, the licensee shall be responsible for all aspects of safety and radiation protection of workers, public and environment during the decommissioning activities. A safety culture shall be fostered and maintained by the licensee in order to encourage a questioning and learning attitude to safety and to discourage complacency. The licensee shall implement planning for decommissioning and shall carry out the decommissioning activities in compliance with the applicable PNRA regulations.

- (2) The prime responsibilities of the licensee shall be to:
  - (a) establish a decommissioning strategy and preparing and maintaining a decommissioning plan throughout the lifetime of the facility;
  - (b) provide financial assurances and resources to cover the costs associated with safe decommissioning, including management of the resulting radioactive waste;
  - (c) notify the Authority prior to shutting down the facility permanently or terminating the activity;
  - (d) identify to the Authority an acceptable destination for all waste arising from decommissioning;
  - (e) perform safety assessments and environmental impact assessments related to decommissioning;

(f) perform appropriate radiological surveys in support of decommissioning and to ensure that end state criteria have been met by performing a final survey; and

(g) keep records and submit reports as and when required by the Authority.

(3) A graded approach shall be applied in all aspects of decommissioning in determining the scope and level of detail for any particular facility, consistent with the magnitude of the possible radiation risks arising from the decommissioning.

(4) A Quality Assurance Program shall provide a single framework for the arrangements and processes necessary to address all the goals of the licensee, including goals relevant to decommissioning. These goals shall include but not limited to safety, health, security, environmental, quality and economic elements.

(5) Individuals performing decommissioning actions shall have the necessary skills, expertise and training to perform decommissioning safely. Provisions shall be made to ensure that institutional knowledge about the facility is obtained and made accessible and, as far as possible, that key staff from the facility are retained.

**6. Decommissioning Strategy.**— (1) The licensee shall define a decommissioning strategy on which the planning for decommissioning will be based.

(2) The licensee shall demonstrate that, for the selected strategy, the facility will be maintained in a safe configuration at all times and will be adequately decommissioned in the future and that no undue burdens will be imposed on future generations.

(3) The decommissioning strategy shall take into account that, until authorization has been given to implement the final decommissioning plan, the facility shall be considered an operating facility. All regulatory requirements prescribed by the PNRA regulations shall remain applicable unless the Authority has agreed to their reduction on the basis of a reduction of the hazards (e.g. the removal of nuclear material from the facility).

(4) For sites with more than one facility, a site strategy for decommissioning shall be developed to ensure that interdependences between the facilities are taken into account in the planning for individual facilities that will lead to final decommissioning plans for each facility (e.g. by means of release of parts of the site from regulatory control, if justified).

(5) If permanent shutdown of a facility is sudden, the decommissioning strategy shall be reviewed on the basis of the situation that initiated the sudden shutdown, to determine whether revision of the strategy is required. If shutdown is caused by an accident, the facility shall be brought to a safe configuration before an approved final decommissioning plan is implemented.

**7. Decommissioning Planning.**— (1) The licensee shall prepare and maintain a decommissioning plan throughout the lifetime of the facility in order to show that decommissioning can be accomplished safely to meet the defined end state.

(2) For a new facility, planning for decommissioning shall begin early in the design stage and shall continue through to termination of the authorization for decommissioning. The licensee/applicant shall take into account eventual decommissioning activities in the design, construction and operation of the facility, including features to facilitate decommissioning, the maintenance of records of the facility, and consideration of physical and procedural methods to prevent the spread of contamination.

(3) For existing facilities where a decommissioning plan does not exist, a suitable plan for decommissioning shall be prepared and submitted, within one year after the promulgation of these regulations.

(4) The initial decommissioning plan shall be required in order to identify decommissioning options, to demonstrate the feasibility of decommissioning, to ensure that sufficient financial resources will be available for decommissioning, and to identify categories and estimate quantities of waste that will be generated during decommissioning.

(5) The decommissioning plan shall be reviewed and updated periodically, as follows:

- (a) every five years for nuclear installations;
- (b) as prescribed by the Authority for other facilities;
- (c) when specific circumstances warrant, such as if changes in an operational process lead to significant changes to the plan.

(6) The decommissioning plan shall be updated as necessary in the light of relevant operational experience gained, available lessons learned from the decommissioning of similar facilities, new or revised safety requirements, or technological developments relevant to the selected decommissioning strategy. If an accident occurs or a situation arises with consequences relevant for decommissioning, the decommissioning plan shall be updated by the licensee as soon as possible and shall be submitted to the Authority for approval.

(7) If deferred dismantling has been selected as a decommissioning strategy, the licensee shall demonstrate in the final decommissioning plan and supporting documents that such an option will be implemented safely. The availability of adequate financial resources to ensure that the facility is maintained in a safe condition during the deferral period and for subsequent decontamination and/or dismantling shall be demonstrated.

(8) The final decommissioning plan shall be supported by an appropriate safety assessment covering the planned decommissioning activities and abnormal events that may occur during decommissioning. The assessment shall address amongst others occupational exposures and potential releases of radioactive substances with resulting exposure of the public.

(9) During the preparation and updating of the final decommissioning plan, the extent and type of radioactive material at the facility (e.g. activated and contaminated structures and components) shall be determined by means of a detailed characterization, survey and on the basis of records collected during the operational period. If contamination or radioactive waste from operations remains at the facility (and/or in subsurface soils and groundwater), such radioactive material shall be included in the characterization survey. Additional characterization of the site for the purpose of evaluating and preventing the potential migration of radionuclides shall be considered.

(10) The final decommissioning plan and supporting documents shall at least cover the following: the selected decommissioning strategy; the schedule, type and sequence of decommissioning actions; the waste management strategy applied, including clearance, the proposed end state and how the licensee will demonstrate that the end state has been achieved; the storage and disposal of the waste from decommissioning; the timeframe for decommissioning; and financing for the completion of decommissioning.

(11) Appropriate records and reports that are relevant to decommissioning (e.g. records on the use of the facility, events and incidents, radionuclide inventories, dose rates and contamination levels) shall be retained during the lifetime of the facility.

**8. Decommissioning Funding.**— (1) The licensees of nuclear installations and radiation facilities where the Authority deems necessary, shall establish a mechanism to provide and ensure adequate financial resources for safe and timely decommissioning which shall not be used for any other purpose.

(2) If financial assurance for the decommissioning of an existing facility has not been obtained, suitable funding provision shall be put in place. Provisions for financial assurance shall be required prior to license renewal or extension.

(3) The cost estimate for decommissioning shall be updated on the basis of the periodic update of the initial decommissioning plan or on the basis of the final decommissioning plan. The mechanism used to provide financial assurance shall be consistent with the cost estimate for the facility and shall be changed if necessary.

(4) Adequate financial resources to cover the costs associated with safe decommissioning, including the management of the resulting waste, shall be available when needed, even in the event of premature shutdown of the facility. The licensee shall provide financial assurance in this regard before operating the facility.

**9. Conduct of Decommissioning.**— (1) The licensee shall implement the decommissioning and related waste management activities in compliance with the applicable PNRA Regulations.

(2) Prior to using any new or untried methods for decommissioning, it shall be demonstrated that the use of such methods is justified and is addressed within the optimization analysis supporting the decommissioning plan. Such analyses shall be subject to review and approval by the Authority.

(3) Emergency planning arrangements, commensurate with the hazards, shall be established and maintained and incidents significant to safety shall be reported to the Authority in a timely manner.

(4) A proper waste management path shall be established for all waste streams arising from decommissioning activities.

(5) Prior to starting decommissioning, the licensee shall ensure the availability of adequate processing and storage capabilities and transport packages for the radioactive waste.

(6) In accordance with the final decommissioning plan, decommissioning techniques shall be selected such that protection and safety is optimized, protection of the environment is ensured, the generation of waste is minimized and any potential negative impact on the storage and disposal of waste is minimized. As decommissioning actions progress, such as decontamination, cutting and handling of large components, new hazards may arise. The impact of these actions on safety shall be assessed and managed so that the potential consequences of such new hazards are prevented or are detected and mitigated.

(7) During decommissioning, the licensee shall maintain an up to date list of structures, systems and components important to safety. Such structures, systems and components can progressively be declassified and dismantled as the decommissioning progresses, provided that the facility's inspection and maintenance program is updated accordingly.

(8) If a facility undergoes a sudden or unintended shutdown, the final decommissioning plan shall be submitted to the Authority for approval within two years of the cessation of the authorized activities, unless an alternative schedule for the submission of the final decommissioning plan is specifically authorized by the Authority. The licensee shall not implement the decommissioning plan until the Authority has approved it.

(9) In case of deferred dismantling, the licensee shall ensure that the facility has been placed, and will be maintained, in a safe configuration and will be appropriately decommissioned in future. In order to ensure safety during the period of deferment, the licensee shall submit surveillance program for approval of the Authority and maintenance program for reference and record.

(10) The licensee shall report the following to the Authority:

- (a) The declaration of any of the emergency classes specified in the licensee's approved Emergency Plan;
- (b) Other events, within sixty (60) days after the discovery, such as:
  - (i) The serious illness or injury or death of any person incurred as a result of the decommissioning;
  - (ii) The occurrence of an event that has resulted, that is likely to result, or that may result, in the exposure of a person or organ or tissue to radiation in excess of the applicable radiation dose limits.

**10. Completion of Decommissioning.**— (1) On completion of decommissioning actions, it shall be demonstrated that the end state criteria as defined in the decommissioning plan and any additional regulatory requirements have been met in accordance with the applicable PNRA Regulations. A decommissioning completion report shall be prepared and submitted to the Authority for review and approval. The Authority may decide for the release of facility/site or part thereof, from regulatory control for unrestricted use if the residual radioactivity, distinguishable from background radiation, results in a total effective dose to a member of the critical group not greater than 0.3 mSv per year.

(2) A system shall be established to ensure that all records are maintained in accordance with the records keeping requirements of the approved quality assurance program of the facility/site and applicable PNRA Regulations.

(3) If radioactive waste or spent fuel is stored on the site after completion of the decommissioning, the said storage facility will be licensed by the Authority as per PNRA Regulations for Licensing of Nuclear Installations in Pakistan – (PAK/909).

(4) In case of release of part of the site/facility from regulatory control, a revised authorization/licence for the remainder of the site shall be sought from the Authority.

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ZAHEER AYUB BAIG,  
*Member (Corporate).*