(7) Japanese regulations for waste management

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Abstract–NRA is preparing new regulatory framework for the Intermediate Depth Disposal which will be located at least 70 m below the ground level, and contain core internals etc. arouse from decommissioning of nuclear power plants (NPP)s. NRA has considered the combination of the requirements for siting, design, radiation protection, and limitation of inventory for this type of disposal with institutional control for after closure. Because the waste for the Intermediate Depth Disposal contains relatively high concentration of short-lived nuclides, significant amounts of long-lived nuclides, and nuclides having half-lives of longer than 100,000 years, disposal facility should be met below requirements; (i) Disposal facility shall be designed so that to confine nuclides within the engineered barrier, until the termination of the license (about 300 years after closure). (ii) Disposal facility shall be isolated from natural disruptive events and human activities such as constructing buildings or excavating tunnels, at least 100,000 years. For this reason, disposal should not be located in the area where volcanic eruption or faulting activities would directly affect, and it should be located more than 70 m below ground level until 100,000 years after closure. Nuclear Reactor Regulation Act was amended in April 2017, to restrict the land use of the site after the termination of licence to avoid inadvertent human intrusion. (iii) Disposal facility shall be designed and natural barrier shall be selected so that the release of nuclides from the disposal would be As Low As Reasonably Achievable. The dose for the representative person shall not exceed dose constrain. (iv) Inventory of long-lived nuclides shall be limited below the level derived from safety assessment which the person hypothetically would contact with wastes at 100,000 years after closure and the dose of the person wouldn't exceed 20 mSv/y. NRA is preparing a guide for the design requirements, which shows items to be studied, features to be functioned, and index to be used in the selection process of preferable design option. Design process is as follows; (i) Design concept to show the function and barrier to contain each nuclide. (ii) Selection of preferable place for disposal within the site area, considering ground water flow, distance to the biosphere, geochemical stability etc.. (iii) Selection of preferable engineered barrier design to contain nuclides, considering Best Available Technique applied at the similar facilities. NRA is considering the way to take these regulation framework to that of shallow land disposal, even though they wouldn't have much design options and most of radio activities will decay by the termination of licence.