National Profile

a. **National framework for management of radioactive waste and spent fuel** (policies, strategies, roles, and responsibilities of different stakeholders(e.g. institutions overview, implementing organizations))

Iran Radioactive Waste Management Company (IRWA) is designated by the AEOI as the national waste management organization in I.R. of Iran to be responsible for managing all aspects of radioactive waste activities in the country, including transportation, treatment and storage of institutional radioactive waste received from the minor waste generators. The IRWA was established in 1983 in order to perform all required activities and task for fulfillment of its responsibilities under framework of Iran Nuclear regulatory Authority (INRA). The IRWA is the only authorized organization responsible for safe disposal of radioactive waste including operational and decommissioning waste generated in the country in accordance with the requirements set by the INRA.

Mission

IRWA as the only responsible organization for safe and long term management of Radioactive Waste and Spent Fuel in I.R. of Iran is committed to protect human health, future generations and the environment from hazards of radioactive waste at the present and in the future. IRWA, by development and application of sustainable and modern technology, relying on suitably qualified and experienced human resources as the main asset and the observance of national and international standards, manages all generated radioactive waste from nuclear facilities and other industries in the country in a safe, transparent and reliable method.

Vision

One of the advanced companies in the nuclear waste management technology among developing countries, and the owner of low and intermediate radioactive waste storage technology in the next 10 years.

RADIOACTIVE WASTE MANAGEMENT POLICIES AND PROGRAMMES

IRWA Policies in Brief:

- Protection of the human health
- Protection of the environment
- Protection beyond the national borders
- Protection of the future generations
- No burden on the future generations
- Managing radioactive waste based on national legal framework
- Minimization of radioactive waste generation
- Establishing radioactive waste generation and management interdependencies

- Ensuring the safety of the waste management facilities

IRWA Core Tasks:

- Transportation, storage, treatment and disposal of radioactive waste
- Site selection, construction, operation and post-closure management of radioactive waste disposal facility
- Design and construction of near surface disposal facility
- Public relation for radioactive waste management
- Performance of related R&D
- Human resources development and training
- International cooperation on radioactive waste management
- Administration and management of funds available for relevant radioactive waste management activities
- Management of NORM waste from gas and oil and other industries
- Liquid waste treatment, Collection & Conditioning of disused sealed sources
- Transportation of institutional wastes and interim storage

Sources of Radioactive Waste In I.R. of Iran:

- Nuclear research centers and research reactors
- Nuclear medical and industrial centers
- Other Nuclear fuel cycle facilities
- NORM and TENORM producing industries

b. **National legal and regulatory framework** (primary legislation, regulations, regulatory organization, specific activities and facilities under regulation, and guidance on implementation)

The Iranian Regulatory Authority (INRA) is responsible for preparing the necessary technical standards, regulation and procedures in all fields related to safety, radiation protections and to supervise radioactive waste producers.

➢ **Laws and Acts**

1. Atomic Energy Act of Iran (legislated in 1974);
2. Radiation Protection Act of Iran (legislated in 1989).
3. Safe and Peaceful Utilization of Nuclear Energy in the I.R. of Iran(in the Approval stage)
4. Safeguards Agreement between IRAN and IAEA Act, 1974

➢ **Regulations**

1. Basic Radiation Safety Standards (BRSS) (legislated in 1999).

2. Radiation Protection Regulations (legislated in 1990).

3. Radiation Protection Criteria for the Bushehr Nuclear Power Plant (BNPP-1) (legislated in 1999).

4. Radioactive Wastes and Discharges (medical centers), Feb. 2002, NRPD-RWD-1.

5. Regulations on the Physical Protection Nuclear Material and Nuclear Facilities NNSG-RE-083-50/01-2-Jun. 2013

Guidance documents

1. Licensing Procedure for Nuclear Fuel Cycle Facilities, July 2001, No. NNSD-RG-FCF-0020-01/07.

2. Quality Assurance Criteria for Nuclear Facilities, No. NSD-R-0090-98

3. Licensing Procedures for the Bushehr NPP Unit 1, Sept. 1999, No. NNSD-R-0050-99/09.

4. Guidelines and Format for Establishing a System of Accounting for and Control of Nuclear Material and Nuclear Facilities INRA-SG-RG-081-55/1-1-Jul. 2010

c. **Radioactive waste management, decommissioning and spent fuel strategy and current practice and technologies** (waste and spent fuel management activities/facilities programs, overview of research and development programs, overview of financing of waste and spent fuel management)

Followings are the most important and useful experiences of IRWA:

- Design and construction of near surface repository for L/IL radioactive wastes;
- Design, construction, and operation of treatment systems for liquid radioactive wastes;
- Handling, storage, and management of solid and solidified radioactive wastes;
- Design and construction of transportation system for radioactive wastes;
- Development of operational and post-closure safety assessment reports for all waste management operations and facilities;
- Management of disused radioactive sealed sources;
- Performing site selection activities by surveying the whole country to select the most suitable site that can provide adequate isolation of radioactive waste from the human and environment;

d. **Radioactive waste classification, waste and spent fuel quantities** (inventory, including disused sources that are declared Radioactive waste)

Classification of Radioactive Waste in Iran

As established by INRA, radioactive waste, on the basis of its radioactivity level, can be classified as follows:

WASTE CLASSES	TYPICAL CHARACTERISTICS	DISPOSAL OPTIONS
1. Exempt Waste (EW)	Activity levels at or below clearance	No radiological restrictions
2. Low and Intermediate Level Waste (LILW)	Activity levels above clearance levels and residual heat generation below 2 kW/m^3.	
2.1. Short Lived Waste (LILW-SL)	Restricted long-lived radionuclide.	Surface, near surface or geological disposal facility
2.2. Long Lived Waste (LILW-LL)	Long-lived radionuclide concentrations above limitations for short lived waste.	Geological disposal facility
3. High Level Waste (HLW)	Residual heat generation above 2 kW/m^3 and long-lived radionuclide concentrations above limitations for short lived waste.	Geological disposal facility

Inventory of radioactive Waste At IRWA (2015)

Radionuclide	Activity (range)	number	Action plan
Cs-137	0.9 GBq to 74 GBq	About 200	Reuse
Co- 60	0.18 GBq to 1.3 GBq	About 315	Reuse and condition
Teletherapy head	About 30 TBq	32	storage
Ir -192	10 GBq to 400 GBq	About 4000	condition
Sr-90	0.48 MBq to 0.9 MBq	44	storage
Ra-226	Unknown/ untreated About 1.5 GBq	198	condition
Am-241	37 GBq	2	storage
Am-Be	1.4 GBq	16	storage
Cf-251	0.7 GBq	5	storage
Smoke detectors	25 KBq	2500	storage
Nuclear fuel cycle facilities	0.5 KBq	195 m^3	storage
Research Reactor solidified Waste	100 Mq	50 m^3	storage