Fifth Workshop on Science and Values in Radiological Protection Decision Making

Regulatory Update on RP Issues Related to National Waste Management Activities and Radiation Sources Applications

A. Principe - C. Salierno
The current Italian legislative and regulatory framework, which is applicable to safe management of radioactive wastes, takes into account the Italian previous experience in licensing and operation of NPPs, of different types and generations, and other nuclear installations.

The national regulatory framework is also updated to reflect any change in the nuclear policy.

The source of legally binding rules of the Italian regulatory system is constituted by:

- Act No. 1860/1962 which establishes that the operation of nuclear installations, including those related to spent fuel and radioactive wastes management, is authorized by the Ministry of Economic Development;
- Legislative Decree No. 230/1995, that is the main piece of legislation regulating in particular the licensing process and laying down radiation protection requirements for workers and the public;
- Legislative Decree No. 31/2010 which regulates the siting, construction and operation of the National Repository for radioactive waste;
- Ministerial Decree of August 7, 2015 which establishes a new radioactive waste classification system, also in relation to international standards, replacing the old classification.
In particular...

**Legislative Decree No. 45/2014**, which is the transposition of European Union Directive 2011/70/EURATOM, states that:

**National Programme**

by decree of the President of the Council of Ministers, on the proposal of Ministry of Economic Development and the Ministry for Environment and Land and Sea Protection, taking into account the advice from the Minister of Health, the State Regions Joint Conference and the Competent regulatory Authority, and duly taking into account observations of the public, is defined the national programme for the management of spent fuel and radioactive waste, including all types of spent fuel and radioactive waste subject to national jurisdiction and all stages of management of spent fuel and radioactive waste, from generation to disposal.

**Classification of radioactive waste**

the Ministry of Environment, Land and Sea Protection and the Ministry of Economic Development, upon proposal of the competent regulatory body adopt, with an inter-ministerial decree the classification of radioactive waste, correspondingly to the International standards and taking into account its properties and specific typologies.
In the past
Art. 153 of the Legislative Decree No. 230/95 gives ISIN the mandate to issue technical guides in the field of nuclear safety and radiation protection. Technical guides do not have a mandatory nature during the authorization processes. They however establish specific regulatory requirements the applicant must apply, even through adequate alternative solutions to be justified during the licensing process. Technical Guide No. 26 on "Radioactive waste management" establishes requirements related also to waste originated from decommissioning.

Today
On the basis of the Legislative Decree No. 45/2014, on 7 August 2015 an Economic development and Environmental Ministries joined Decree was issued about a new radioactive waste classification according to IAEA recommendations.

The Decree of 7 August 2015 replaces Technical Guide N0.26 and establishes the final destination of the different waste categories according to the new classification as established by the same decree.

A. Principe - C. Salierno
### Table 1. Final destination of different waste categories (waste with radionuclides of natural origin are not included)

<table>
<thead>
<tr>
<th>Category</th>
<th>Conditions and/or Activity concentrations</th>
<th>Final destination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exempt materials (EW)</strong></td>
<td>• Art. 154 Section 2, Legislative Decree No. 230/1995&lt;br&gt;• Art. 30 or Article 154, paragraph 3-bis, of Legislative Decree No. 230/1995</td>
<td>Compliance with the provisions of the Legislative Decree No. 152/2006</td>
</tr>
<tr>
<td><strong>Very short lived waste (VSLW)</strong></td>
<td>• $T_{1/2} &lt; 100$ days&lt;br&gt;Reaching the following conditions in 5 years:&lt;br&gt;• Art. 154 paragraph 2 of Legislative Decree No. 230/1995&lt;br&gt;• Art. 30 or Art. 154 paragraph 3-bis of Legislative Decree No. 230/1995</td>
<td>Temporary storage (art. 33 Legislative Decree No. 230/1995) and disposal in compliance with the provisions of the Legislative Decree No. 152/2006</td>
</tr>
<tr>
<td><strong>Very low level waste (VLLW)</strong></td>
<td>• $\leq 100$ Bq/g (with alpha contribution $\leq 10$ Bq/g)&lt;br&gt;Achievement in $T \leq 10$ years of the condition:&lt;br&gt;• Art. 30 or Art. 154 paragraph 3-bis of Legislative Decree No. 230/1995</td>
<td>Surface, or small depth, disposal facilities with engineered barriers&lt;br&gt;(National Repository according to Legislative Decree No. 31/2010)</td>
</tr>
<tr>
<td><strong>Low Level Waste (LLW)</strong></td>
<td>• short-lived radionuclides $\leq 5$ MBq/g&lt;br&gt;$^{38}$Ni, $^{65}$Ni $\leq 40$ kBq/g&lt;br&gt;long-lived radionuclides $\leq 400$ Bq/g</td>
<td></td>
</tr>
<tr>
<td><strong>Intermediate Level Waste (ILW)</strong></td>
<td>• short-lived radionuclides $&gt; 5$ MBq/g&lt;br&gt;$^{38}$Ni, $^{65}$Ni $&gt; 40$ kBq/g&lt;br&gt;long-lived radionuclides $&gt; 400$ Bq/g&lt;br&gt;No heat production</td>
<td>temporary storage facility of the National Repository (Legislative Decree No. 31/2010) waiting for the geological disposal</td>
</tr>
<tr>
<td><strong>High Level Waste (HLW)</strong></td>
<td>Heat production or high concentrations of long-lived radionuclides, or both such characteristics.</td>
<td></td>
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</tbody>
</table>
Table 2. Correlation between T.G. No.26 and the new classification

<table>
<thead>
<tr>
<th>Old waste Classification Tecnical Guide No. 26, 1987</th>
<th>Current waste classification</th>
</tr>
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<tbody>
<tr>
<td>1st Category</td>
<td>VSLW—Very Short Lived Waste</td>
</tr>
<tr>
<td>2nd Category</td>
<td>VLLW—Very Low Level Waste</td>
</tr>
<tr>
<td>3rd Category</td>
<td>LLW—Low Level Waste</td>
</tr>
<tr>
<td></td>
<td>ILW—Intermediate Level Waste</td>
</tr>
<tr>
<td></td>
<td>HLW—High Level Waste</td>
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</tbody>
</table>
Radioactive wastes containing naturally occurring radionuclides arise from the extraction and/or processing of materials that happen to be rich in naturally occurring radioactive materials; these materials include phosphate minerals, mineral sands, some gold-bearing rocks, coal and hydrocarbons, and contain long lived radionuclides at relatively low concentrations.

The concentration of the radionuclides in these waste streams may exceed the levels for exempt waste.

In recent years an increasing awareness has arisen that action is required to reduce doses due to exposure to such waste and that regulatory control is necessary to ensure safety.

According to EURATOM Directive 2013/59 NORM industries shall be managed within the same regulatory framework as other practices.
Today
there is not any legislative provision on the management of waste originated from NORM activities. Waste management is established on case by case basis.

Future
Requirements on NORM Waste management will be implemented with the transposition of Euratom Directive 2013/59.

Challenge issue in the transposition:
- long half-lives radionuclides
- large volumes of materials and low concentration of activity
- the characteristics of such waste are sufficiently different from those of other waste and specific regulatory considerations may be required
(They also include chemical pollution. Approach, responsibilities and methods are generally different for chemical and radiological aspects. Legislative Decree No. 152 of 3 April 2006 and subsequent amendments, concerning environmental regulations, is the legislative framework of reference for all aspects related to chemical pollution)
New radiation source applications
Non-medical imaging

In recent years practices involving the exposure of persons — both workers and members of the public — for non-medical purposes, such as security screening and detection of drugs being trafficked, have been proposed or introduced.

Human imaging for purposes other than medical diagnosis, medical treatment or biomedical research is being performed for many different purposes.

Provisions relating to these types of exposure — referred to as human imaging using radiation for purposes other than medical diagnosis, medical treatment or biomedical research — are stated in Euratom Directive 2013/59 and will be implemented in the national legislation by the transposition.

Euratom Directive 2013/59 provides different dispositions for the justification of practices involving non-medical imaging depending if the imaging is carried by medical or non-medical devices.
THANK YOU FOR YOUR ATTENTION