Management of spent fuel and radioactive waste: EU legal framework

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Under Council Directive 2011/70/Euratom on the responsible and safe management of spent fuel and radioactive waste, the Commission is required to submit to the European Parliament and Council, every three years, a progress report on the implementation of this Directive and an inventory of radioactive waste and spent fuel present in the Community's territory, with a view to future developments.

The first report presented a comprehensive overview of the situation, which covered a reporting period until August 2015 with a reference date of December 2013.

The present report provides an update of progress accomplished by Member States in implementing the Directive, in particular on the measures put in place to ensure that workers and the general public are protected against dangers arising from ionising radiation now and in the future, through the highest safety standards for radioactive waste and spent fuel management, and to avoid imposing undue burdens on future generations.

Situation in the EU

The report noted that all Member States generate radioactive waste through various activities ranging from medical applications to electricity generation. 21 Member States also manage spent nuclear fuel on their territory. Owing to its radiological properties and the potential hazard it poses to workers, the general public, and the environment, the safe management of such material from generation to disposal must be ensured.

Each Member State defines its own electricity generation mix and as of the reporting date nuclear power plants are in operations in 14 countries. Two other Member States, Lithuania and Italy, have terminated their nuclear power programmes and are decommissioning their nuclear installations. These 16 Member States with nuclear power programmes together account for 99.7% in volume of the radioactive waste inventory in the EU.

At the time of reporting, 126 nuclear power reactors were in operation, with a total capacity of about 119 GWe, 90 nuclear power reactors were shut-down, and 3 were decommissioned. In addition, there were 82 research reactors in 19 Member States either in operation, long-term shutdown, or under decommissioning.

Inventory estimates and trends

The estimated total inventory of radioactive waste on the EU territory at the end of 2016 was 3 466 000 m3 (4.6 % increase over three years), corresponding to an average of about 7 liters per-capita in the EU. On average the amount of the radioactive waste in storage (983 000 m3) did not significantly change in comparison to 2013. Low-level waste dominates EU radioactive waste inventory. Intermediate-level waste and high-level waste are generated and stored predominantly in the Member States with nuclear power programmes. At the end of 2016, approximately 58 000 tHM of spent fuel was stored in the EU, (7% increase over three years).

According to the Commission, by 2030 very-low-level waste amounts are expected to double, while the other waste classes are expected to increase by 20-50%. Therefore, attention should be paid to the minimisation of radioactive waste at the origin, development and implementation of predisposal options to reduce waste volumes and the development of new storage or disposal facilities.

Measures taken by the Member States

The report noted that in the last three years Member States have made a number of steps towards demonstrating that they have been taking reasonable actions to ensure that no undue burden is passed to future generations and that radioactive waste and spent fuel is managed safely. Member States need to further accelerate in addressing key challenges.

The Commission encourages Member States, which have not yet done so, to take a swift decision on their policies, concepts and plans for the disposal of radioactive waste, in particular intermediate-level waste and high-level waste. Member States that consider shared solutions, should cluster up and take practical measures, including site-specific matters. Another key challenge remains ensuring that adequate funds will be available for the costs of national programmes.

National Programmes

The Commission noted different stages of implementation of the national programmes. Several Member States reported a few years' delays in the implementation of programmes, including for the first geological disposal facilities. In most Member States, further work is needed in developing and implementing clear key performance indicators to monitor progress in effective and transparent ways, and to ensure timely accomplishments.

Further efforts are also needed to:

- improve the inventory projections for the scope of the national programmes, including decommissioning waste, institutional waste and waste from remediation activities, and the demonstration of sufficient capacities for storage and disposal;

- specify, demonstrate or guarantee the functional independence of the competent regulatory authority;

establish adequate arrangements requiring sufficient human and financial resources for the competent national authorities;

- share the outcomes of self-assessments and international peer reviews, engage in a transparent dialogue with stakeholders and facilitate the exchange of good practice and knowledge at Union level;

- continue research, development and training which play an important role in defining long-term solutions for the management of intermediate and high-level waste and spent fuel;

- to improve the quality of the national reports which they notify to the Commission.

The Commission intends to follow up on the infringement procedures and legal actions initiated in the previous reporting cycle and will continue to assist Member States in fully implementing the legislation.