RADIOACTIVE WASTE MANAGEMENT IN THE EUROPEAN UNION - PROGRESS TOWARDS NEW LEGISLATION

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ABSTRACT

In January 2003, the European Commission adopted, as part of what was known as a "nuclear package", a proposal for legislation on radioactive waste management. The background to the proposal and the approach followed were described in detail at WM'03. Since that time, the proposal has been extensive debated with many organisations, institutions and national authorities and been the subject of presentations and discussions in a wide range of conferences and other forums.

The discussions on the "Waste Directive", as it is commonly known, quickly focussed on a relatively limited number of issues. Some of these were clearly technical while others were political in nature. Some issues were very specific and could be precisely defined while others were rather vague. Incorrect perception or misunderstanding also played a role in forming opinions about the proposal.

The most controversial – and most debated - issue was that of common deadlines for the identification of disposal sites and for their licensing for operation. However, the most difficult issue to resolve has been that related to the export of radioactive waste from one State to another. This has been variously interpreted by some as allowing dumping of radioactive waste in third countries and by others as opening the door to a Member State being forced to take another State's waste. Neither interpretation is correct but they have served to launch an extensive, but inconclusive, debate on regional repositories.

The proposed legislation has also been interpreted as identifying geological disposal as the unique method of long-term management of high-level waste. This is not what it does, though the Commission has made it clear that it believes that geological disposal is the only safe and sustainable option available based on our present level of knowledge.

In the light of all the discussions, the Commission has revised its original proposal concerning these and some other specific issues.

After briefly summarising the background and content of the original Waste Directive, the main elements of the discussions that followed are described. Particular emphasis is placed on the political aspects of the debate. The changes that have been made to the Commission's proposal are explained and a report made on the progress towards adoption of the legislation.

Radioactive Waste Management in the European Union – The Present Situation

In April 2003, the Commission published its fifth "Situation Report" on radioactive waste management in the European Union (1). For the first time, the report covered radioactive waste management in both what were then the Member States (EU-15) but also in the Accession Countries (now new Member States - EU-10) and the other application countries with nuclear power plants (Bulgaria and Romania). The full report can be downloaded from the Commission's web site.

Annual production of all conditioned radioactive waste in the EU-15 was reported at around 40,000m^3. This is around 10,000 m^3 year less than was reported in the fourth situation report in 1999. To this amount can be added 5,000 m^3 of low and intermediate level waste that is produced each year in EU-10, to give a total for the enlarged European Union (EU-25) of around 45,000 m^3/year.

Quantities of high level waste and spent fuel are somewhat more difficult to calculate as it depends on the actual technology used for the management of the spent fuel – the reprocessing or direct disposal route. Some States calculate the actual amount of glass containing the waste for disposal rather than the volume of the original waste material on its own. Others calculate the weight of heavy metal contained in the fuel elements rather than the volume of the conditioned and packaged waste. It is estimated that the total volume of such waste – once it is in a form for disposal – would be in the region of 400 to 500 m^3/year for EU-15 and between 50 and 70 m^3/year for EU-10. Around 250 m^3/year of this would be vitrified waste and the remainder spent fuel.

We should keep these quantities in perspective. It is estimated that approximately 2 billion tonnes of waste are produced in the Union every year – close to 4 tonnes per inhabitant. Around 35 million tonnes of this is "hazardous waste" – 80 kg per inhabitant.

Of the radioactive waste, a very large percentage of it is now disposed of in very closely regulated sites. By now, close to 2 million m^3 of low and some intermediate level wastes have been finally disposed of. A large majority of the wastes have been disposed of at Drigg in the UK and at the Centre de la Manche and Centre de l'Aube in France. Near surface and shallow disposal are still the main techniques used. In EU-15, Finland, France, Spain, Sweden and the United Kingdom operate surface- and shallow-disposal facilities for radioactive waste containing only small quantities of long-lived radionuclides. In the new Member States, only two countries – the Czech Republic and Slovakia – have repositories for low and intermediate level nuclear waste, though some others have repositories that only take institutional wastes.

The Biggest Issue for Radioactive Waste Management

Undoubtedly the single biggest issue concerning radioactive waste management is that of high level waste. Most processes involved in radioactive waste management have reached the stage of industrial use. The only element lacking is actual disposal of high-level and heat-generating waste.

Some countries managing high level wastes have no plans for what to do with it. Several countries with nuclear power production plants, have - to date - decided to postpone disposal of

high-level waste for periods ranging from at least fifty to more than one hundred years. Only Sweden and Finland are close to authorising sites that could enter operation towards the end of the next decade. Most Member States are still far from siting a repository, though Belgium has operated an underground laboratory for several years and France is in the process of building one. The new Member States generally lag behind the current Member States, many of them having initially expected to export their spent fuel to Russia.

There is now a very broad consensus on the concept of geological disposal. There are no technical reasons to delay decisions on disposal. The European Commission views geological disposal, with our present state of knowledge, as the only safe and sustainable option for long-term management

However, there continues to be opposition from large sectors of the public to most proposals concerning the siting of repositories. Given this, it is increasingly difficult to get political support – or even political decisions – on such sites. This failure to advance to the next stage in the waste management process reinforces the Public's initial suspicions and resistance. In turn, this makes political decisions even harder. There was clearly a need for a strong political initiative to give support to those Member States that were moving ahead with their waste management programmes and to give some much needed momentum to other Member States who were clearly failing to make significant or sufficient progress.

The Link between Waste and Security of Supply

In November 2000, the European Commission adopted a Green Paper on security of supply or – to give it its full title – "Towards a European strategy for the security of energy supply" (2). The Green Paper pointed out that the future of nuclear energy is uncertain, particularly in Europe and depends on several factors including, in particular, a solution to the problems of managing and stocking nuclear waste.

Irrespective of future strategies regarding energy production, the waste that exists now must be dealt with in a way that respects the basic principles of protection of human health and the environment. Action must be taken very soon to ensure that the responsibility and burden of managing the growing quantities of spent fuel and waste held in temporary storage are not passed on to future generations. Current policies in most Member States did not – and do not - adequately address these issues.

The Commission believes that there is a need to keep the nuclear option open. This is not just because it is one of the Union's most secure energy resources – very diversified sources of supply, a fuel whose high energy density makes it easy to stockpile and extensive fuel cycle facilities within the Community result in an extremely low risk of supply interruption. But it is also because it is the environmental benefits – it is only major source of electricity that does not produce any significant quantities of greenhouse gases.

This urgent need to make progress in the European Union to deal with the issue of radioactive waste management, especially for high-level waste, was a very important element of the Nuclear Package.

Some Simple Conclusions about the Situation of Radioactive Waste in the EU

- The EU produces around 45,000 m^3/year – around 1/100th of this is high-level waste.
- Over 2 million m^3 of radioactive waste have already been disposed of safely in the EU.
- No high-level waste or long-lived intermediate level waste has yet been disposed of in the EU.
- Only Finland and Sweden are near to finding sites for their high-level waste repositories.
- There are now no technical reasons to further delay disposal of high-level waste.
- Failure to take political decisions on waste management results in increased Public opposition.
- Failure to make progress on waste is an important factor in the security of energy supply.
- A political initiative is required to accelerate or bring about progress on waste management.

The "Nuclear Package"

In November 2002, the European Commission adopted the first part of what was known as the "Nuclear Package". This was a series of documents centred around the theme of improving nuclear safety in an enlarged European Union. The issue of radioactive waste management was one of the two central themes of the package – the other being safety of nuclear installations – and was the subject of a proposal for new European legislation that was adopted by the Commission in January 2003. The proposal was for a Council Euratom Directive with the title "The management of spent nuclear fuel and radioactive waste" – now better known as the "Waste Directive". The initial (January 2003) proposal was described in some detail in a paper delivered to WM'03 (3). The following section contains a short summary of its objectives and scope.

The Proposed Legislation for Spent Fuel and Radioactive Waste – Objectives and Scope

The objective of the proposed legislation is to bring about progress towards the safe long-term management of spent nuclear fuel and radioactive waste. While the emphasis of the Directive is on high-level waste – including spent nuclear fuel that is to be disposed of directly – it does cover all forms of radioactive waste and all spent nuclear fuel regardless of the management route followed (reprocessing, storage or direct disposal).

The Directive is very much inspired by the Joint Convention[iv] on the safety of spent nuclear fuel and radioactive waste management. It includes a number of "basic requirements" for safe management that will be quickly recognised by all who have studied the Convention. These measures can be considered as established international best practice in the field of spent nuclear fuel and radioactive waste management, and cover such aspects as public health, environmental protection, nuclear safety, financing and governance. Many of these measures are part of current policy in many Member States.

The Directive requires that each Member State establish a clearly defined programme for radioactive waste management covering all radioactive waste under its jurisdiction and covering

all stages of management including disposal. The programme must also cover the management of all spent nuclear fuel that is not subject to reprocessing contracts or, in the case of research reactor fuel, take-back agreements. In particular, the programme shall specify an approach to long-term management and disposal with a definite timetable for each step of the process. Where there is no suitable alternative to disposal available, a small number of decision points must be included in the programme.

The Member States must report at regular intervals on their programmes – every three years - and the Commission, with the help of national experts, will review these reports and publish its own report on the situation regarding radioactive waste management in the Union.

The Debate on the Waste Directive

Throughout 2003 the Nuclear Package – in particular the two Directives - was the centre of a great deal of attention. First, the EU's Economic and Social Committee (EESC) adopted a positive report on the two Directives. This was followed by intense debates in the European Parliament. Initially these debates took place in the Parliament's Industry, Transport, Research and Energy Committee that prepared detailed reports on the two Directives. The reports, that strongly supported the approach for new legislation taken by the Commission in its proposed Directives, were adopted by large majorities in the European Parliament in January 2004.

For the last 18 months – or more in the case of the Waste Directive – the proposals were extensively debated in a wide range of forums. The Waste Directive, in addition to the extensive debates in EESC, the European Parliament and the European Council, has been presented to and debated with representatives of Member States in the Commission's expert working groups, with all the radioactive waste management agencies – both within and even outside the EU, with a wide range of industry representatives including through the European Nuclear Society, Foratom (the trade association representing the European nuclear industry) and Eurelectric (the union of the European electricity industry) and in countless conferences and symposia.

These debates resulted in various proposals for changes to the text that the Commission indicated that it found acceptable.

It also resulted in a text that was broadly acceptable to a significant majority of the Member States.

However, there was one major "sticking point". This was the question of whether the Directives should be adopted as new Community legislation – or if some "non-legally binding" text, such as a Resolution of the Council – should be adopted. In other words – should future co-operation on radioactive waste management and progress at the national level be achieved on a purely voluntary basis – or required by law.

The European Parliament was very clear in its views and came down strongly in favour of binding legislation. However, as the legal basis for the proposed legislation was the EURATOM Treaty, only the European Council has the possibility of adopting them into European law.

To achieve their adoption the proposal needed to attract what is know as a "qualified majority" rather than a simple majority in favour of the proposal. This requires significantly more than a straight majority of States in favour of the Commission's proposals so that six or seven opposing States, out of twenty-five, could block the proposal.

As a result, the proposals failed to be adopted by the Council in its meeting in May 2004 and it was decided that the Council should aim to adopt some "Conclusions" on the proposals at a future meeting. These "Conclusion", adopted by the Council in June 2004, were limited to a political message concerning the commitment of Member States to a high level of nuclear safety and the safe management radioactive waste in the European Union and a commitment to continue to "engage in a wide-ranging consultation process" to further improve nuclear safety and the safety of the management of spent nuclear fuel and radioactive waste. They are not legally binding.

The Commission Adopts a Revised Proposal (September 2004)

In the light of all the debates and discussions, and taking fully into account all the proposals for changes made by the different EU institutions and other bodies, the Commission adopted revised proposals for both the Safety and Waste Directives in September 2004.

The overall objectives of the two proposals remain the same as when they were first adopted in January 2003.

Specifically, the proposals:

- Incorporate into Community legislation the basic principles and regulations concerning the safety of nuclear installations and radioactive waste
- Require Member States to clearly define programmes for radioactive waste management
- Requires Member States to submit reports on both nuclear safety and on their waste management programmes to regular peer reviews

However, there were a number of important changes made to the proposals. For the Waste Directive these changes are described in the following section.

Some Criticism of the Original (January 2002) Proposal and Resulting Changes

In the version of the proposed legislation adopted by the Commission in January 2003, there were three "fixed deadlines" for **authorisations for development and operation of waste repositories**. These were extensively criticised by other European institutions, Member States and the nuclear sector. They have now been removed from the text. However, the Commission still insists on the message these deadlines conveyed. After 50 years or more of producing radioactive waste, it is now urgent to make progress towards a long-term solution.

There was criticism that the proposed Directive emphasised **geological disposal** to the exclusion of possible alternative technologies. This was not true. However, the Directive clearly stated that there is a consensus based on current knowledge that geological disposal is the best method for long-term management of high-level wastes. It also had to be taken into account that it is widely

accepted that some of the present waste forms will not be further processed and that even if partitioning and transmutation became technically feasible and economically attractive, it would still leave a high-level waste stream that would need to be disposed of. The revised version of the Directive continues to encourage progress on geological disposal. But it also advocates research, including into new technologies that would result in less radioactive waste.

The Directive proposed to allow the ***shipment of wastes to third countries*** as an alternative to disposal in a national repository. However, in order to avoid the risk of radioactive waste being sent to a country that could not safely manage it, there were strict conditions that would apply to any such shipments. In particular, the shipments would have to be covered by firm contracts and only take place to a country with appropriate facilities that met the accepted norms and standards of the country of origin and, in the case of special materials are under adequate safeguards. This part of the Directive has also resulted in intense discussions about "**common facilities**" for waste management, the new terminology for "regional repositories" on the one hand and the possibility to impose bans on imports of radioactive waste on the other. While this debate is still far from reaching a consensus, the fact that it now being openly debated must be a significant step in the right direction. The revised version of the Directive tries to clarify the matter further, but all the essential elements from the original text are retained.

Finally, the Directive aimed to encourage more – and better – **research on radioactive waste** management. The Commission's concern was two-fold. First, the level of research on radioactive waste management was – and still is - inadequate. Secondly, the research being undertaken could be more effectively co-ordinated. From looking at the level of research, including development and demonstration (R,D & D), being carried out in those countries that are the most advanced in management of their waste, and often closest to identifying disposal sites – including the USA, a rough figure was derived for the amount of research that is required relative to the amount of nuclear electricity that is produced. This appears to be a reasonable application of the "polluter pays" principle. The amount is around 500 000 euros/year for every terawatt-hour of nuclear electricity generated. Only two or three of the EU's Member States spend this much on radioactive waste research. These are the States that are the closest to identifying long-term management solutions. The remaining States spend significantly less. The Commission believes that in these latter States – and, as a result, in the European Union as a whole - the present level of research is inadequate. This is particularly so for the identification and characterisation of definitive sites for disposal facilities. In addition to encouraging a higher level of research, the Commission wants to see the work better co-ordinated. As a result, while it has removed specific reference to a "Joint Undertaking" (a form of co-ordinated research activity) during the revision of the Directive, it still has plans to introduce proposals to set up such an activity in the coming months.

Some Simple Conclusions about the Proposed new EU Legislation on Radioactive Waste

- The Green Paper on security of energy supply identified radioactive waste as a key issue that must be addressed.
- Waste is a very important element in the European Commission's "Nuclear Package".
- The main objective of the proposed new legislation on radioactive waste was to accelerate progress on the management of high-level waste.

- The new legislation would:
  - Promote the development of common standards and good practices for spent nuclear fuel and radioactive waste management;
  - Require Member States to establish clearly defined programmes for waste management, including a firm time scale for disposal;
  - Encourage a higher level and better co-ordinated research across the Union;
  - Encourage greater Public involvement and increased transparency in the nuclear sector.
- Failure to adopt and bring into force these basic proposals would not be understood by a concerned public, could mean continuing delays in some national waste programmes and have a potentially negative impact on the future of the nuclear option;
- Adoption of the proposed legislation is the responsibility of the European Council. It could be influenced by the positions taken by the present Presidency (Luxembourg) and by the United Kingdom, which takes over the Presidency for the second half of 2005.

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