Joint Convention
Questions Posted To Denmark in 2006

Seq. No	Country	Article	Ref. in National Report
1		General	Section K

Question/ Comment: It is stated that ,,The Nuclear Regulatory Authorities have made the following steps to improve safety. One of them – the survey for orphan sources with mobile measuring equipment under the auspices of Danish Emergency Management Agency".
What kind of regulations are in place in order to ensure that the competent authorities are prepared to recover orphan sources and to deal with radiological emergencies? Did they draw up response plans and measures? What is the system of financial security set up for orphan sources?

Answer: The planned survey for orphan sources will be conducted by the National Institute of Radiation Hygiene in collaboration with the Danish Emergency Management Agency using car-borne gamma spectrometry. The National Institute of Radiation Hygiene is the competent authority regarding recovering of orphan sources. In addition the National Institute of Radiation Hygiene maintains a 24-hour emergency telephone service with a radiation protection officer on duty. The Danish state guarantee the financial security if the responsibility for a recovered orphan source cannot be finally placed by a former user.

Seq. No	Country	Article	Ref. in National Report
2		General	Section A, p 1

Question/ Comment: The report notes that the Parliamentary Decision B48 predetermined the decommissioning strategy of immediate decommissioning, primarily dictated by the availability of experienced personnel, especially staff of the former operating organisation.
Was deferred dismantling evaluated in the process to work out this strategy?

Answer: Besides "immediate dismantling" three other dismantling scenarios with different cooling time were evaluated prior to the decision. An evaluation was also conducted of a "deferred dismantling" scenario. Because Denmark has no other nuclear facilities there is no parallel expertise and new expertise is not likely to be educated in the near future, the "immediate dismantling" scenario was therefore preferred due to the availability of experienced personnel and specialists. Moreover, from a radiation safety perspective there was no substantial benefit of choosing any of the other scenarios. Finally, it was estimated that the total costs for the decommissioning seemed to increase with a prolongation of the time period. Therefore, without obvious benefits a deferred dismantling scenario would violate the principle in the Joint convention to aim to avoid imposing undue burdens on future generations.

Seq. No	Country	Article	Ref. in National Report
3		General	Section A, p.2

Question/ Comment: It is noted in the report that the »Basis for Decision« for a facility for final disposal of LILW should be submitted to the Danish Government in the fall 2005.
What is the status today? Has the »Basis for Decision« been submitted and, if so, what are the main conclusions?

Answer: The Working Group, consisting of members from relevant authorities, has basically finished a draft "Basis for Decision". The draft will be formally finalized upon a

clearance within the Government. Hereafter it will be presented to the Parliament, in the fall 2006. In addition the plan is to have a public hearing of the “Basis for Decision” during the summer of 2006.

Seq. No	Country	Article	Ref. in National Report
4		General	Section A, p.2

Question/ Comment: It is noted in the report that additional staff has been hired to ensure that adequate human resources are available for the process of establishing a final repository.
What analyses have been carried out to identify “adequate resources”?

Answer: No formal analyses have been carried out to identify the need for adequate human and financial resources. The size of the necessary additional staff has been estimated in close collaboration between the Ministry of the Interior and Health and the Nuclear Regulatory Authorities based on the expected work load during the process.

Seq. No	Country	Article	Ref. in National Report
5		General	Section A, p.2

Question/ Comment: The report notes that to ensure transparency in the process, a leaflet was published and one first hearing was made in June 2005. This hearing was not only part of the public information policy but also a way to involve stakeholders in the process.
Could you please provide additional information on plans to involve stakeholder etc., to ensure transparency further on in the process?

Answer: The full extent of involvement of the public and stakeholders has not been finally decided. Formal requirements and procedures in connection with EIA’s will be followed. It is the intention to make the process as transparent to the public as possible, thereby allowing stakeholders to participate actively in the decision process. The process is provisionally planned to involve several public hearings and information meetings as well as publication of additional information leaflets. Working papers are during the entire process made accessible at the homepage of the Ministry of the Interior and Health in order to allow all interested parties to follow the process. In addition the plan is to have a public hearing of the “Basis for Decision” during the summer of 2006.

Seq. No	Country	Article	Ref. in National Report
6		Article 4	

Question/ Comment: Section G; Safety of Spent Fuel Management: How does Denmark comply with the requirements of articles 4, 5 and 9 with regard to its stored spent fuel?

Answer: The spent fuel stored at Danish Decommissioning (very limited amounts) are covered by the Danish legislative and regulatory system and by that of the general authorisation of Danish Decommissioning and the Operational Limits and Conditions issued by the Nuclear Regulatory Authorities. The Operational Limits and Conditions contain specific requirements for the safe management of fissile materials.

Seq. No	Country	Article	Ref. in National Report
7		Article 5	Section B+G

Question/ Comment: Considering the importance of international co-operations in RAW management through bilateral or multilateral mechanisms as stated in the IAEA Convention preamble, is there any plan to participate in such interest forums especially with countries not using NPP?

Answer: The importance of international co-operation in RAW management is recognised by Denmark. The National Institute of Radiation Hygiene, the Nuclear Division under the Danish Emergency Management Agency as well as relevant stake holders are active

players in several international forums, such as EU, IAEA and NEA. In addition Denmark participates in Nordic working groups discussing RAW management. As for participation in forums especially with countries not using NPP Denmark is open minded. Participation in all forums is considered with regard to the scope of the group and the available human and financial resources.

Seq. No	Country	Article	Ref. in National Report
8		Article 5	p. 13

Question/ Comment: Are periodical safety re-assessments required to assure the long-term safety of radioactive waste management facilities which are intended for long-term storage? If so, what are the main features of these assessments?

Answer: Periodical safety re-assessments are not required to assure the long-term safety of radioactive waste management facilities (Please consider Article 16 in the 2003 report). However, confined safety assessments are a consequence of the provisions in the Operational Limits and Conditions for Danish Decommissioning, which require periodical inspections of all waste storage facilities, the stored waste and the general storage conditions. Detailed inspection procedures are specified in the Operational Limits and Conditions for Danish Decommissioning and typically include inspection/test of dose rates (storage interior and exterior), ventilation, humidity etc. The inspections also include testing of various individual functions, conditions or capacities. Inspection periods vary from weekly to annual.

Seq. No	Country	Article	Ref. in National Report
9		Article 6	

Question/ Comment: Introduction: What is the situation concerning the submission of the “Basis for Decision” to the Government?

Answer: The Working Group, consisting of members from relevant authorities, has basically finished a draft “Basis for Decision”. The draft will be formally finalized upon a clearance within the Government. Hereafter it will be presented to the Parliament, in the fall 2006. In addition the plan is to have a public hearing of the “Basis for Decision” during the summer of 2006.

Seq. No	Country	Article	Ref. in National Report
10		Article 10	Section B+G

Question/ Comment: Considering the importance of international co-operations in RAW management through bilateral or multilateral mechanisms as stated in the IAEA Convention preamble, is there any plan to participate in such interest forums especially with countries not using NPP?

Answer: The importance of international co-operation in RAW management is recognised by Denmark. The National Institute of Radiation Hygiene, the Nuclear Division under the Danish Emergency Management Agency as well as relevant stake holders are active players in several international forums, such as EU, IAEA and NEA. In addition Denmark participates in Nordic working groups discussing RAW management. As for participation in forums especially with countries not using NPP Denmark is open minded. Participation in all forums is considered with regard to the scope of the group and the available human and financial resources.

Seq. No	Country	Article	Ref. in National Report
11		Article 10	Section G, p.13

Question/ Comment: It is noted in the report that the policy in Denmark is presently to wait and see if it is possible to find an international solution in line with earlier solutions regarding spent fuel

from the research reactors DR 2 and DR 3 at Risø.
Could Denmark please elaborate on this policy. Is there an alternative to this strategy in case an international solution will not be available within a reasonable period of time?

Answer Denmark is currently exploring whether an international solution regarding the spent fuel in question may be found. When the exploration is finished the matter will be presented to the Parliament. If an international solution is not the option, the planning of a Danish final repository would have to take this into consideration.

Seq. No	Country	Article	Ref. in National Report
12		Article 11	

Question/ Comment Section A; Introduction and Section H; Safety of Radioactive Waste Management – Article 11: What is the result of submission of the “Basis for Decision” to the Danish Government and what are the outcomes agreed upon?

Answer The Working Group, consisting of members from relevant authorities, has basically finished a draft “Basis for Decision”. The draft will be formally finalized upon a clearance within the Government. Hereafter it will be presented to the Parliament, in the fall 2006. In addition the plan is to have a public hearing of the “Basis for Decision” during the summer of 2006.

Seq. No	Country	Article	Ref. in National Report
13		Article 11	Section H

Question/ Comment The actual decision of establishing a repository has not been made now. Is there no time limit for starting the operation of a final repository for LILW. If not, how is the conditioned and unconditioned waste stored for a long period of time and regarding waste drums what kind of measures are planned to solve the corrosion problems within a long-time period ?

Answer In the original Parliament decision (B48, 2003) for the decommissioning of the research reactors it was stated that the area of the nuclear installations should be transformed to green-field within 20 years. To meet this time-schedule, the repository has to be ready some years in advance. Due to the ongoing political and public process no deadline can be finally set. The present Waste Management Plant and storage facilities have been in operation for more than 40 years. The storage of the waste for an additional 15 years will be regulated by the Nuclear Regulatory Authorities within the Operational Limits and Conditions including stipulating standards for waste drums.

Seq. No	Country	Article	Ref. in National Report
14		Article 11	Section G Pages 14-1

Question/ Comment Could Denmark detail the regulatory "background" (national and international) considered as applicable as a basis for the "basis for decision" preparation?

Answer The following international standards and guides were used as background material for the “Basis of Decision”:

- IAEA Safety Standards:
  - The Principles of Radioactive Waste Management, No. 111-F, 1995.
  - Siting of Near Surface Disposal Facilities, No. 111-G-3.1, 1994.
  - Siting of Geological Disposal Facilities, No. 111-G-4.1, 1994.
  - Borehole Facilities for the Disposal of Radioactive Waste, DS 335, Draft, 2004.
  - Geological Disposal of Radioactive Waste. Safety Requirements. Draft. 2004.
  - Near Surface Disposal of Radioactive Waste, No. WS-R-1, 1999.
  - Safety Assessment for near Surface Disposal of Radioactive Waste, No. WS-G-1.1,

1995.
o Classification of Radioactive Waste, No. 111-G-1.1, 1994.
o Surveillance and Monitoring of Near Surface Disposal Facilities for Radioactive Waste, No. 35, 2004.
• IAEA:
o Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 1997.
o The Long Term Storage of Radioactive Waste: Safety and Sustainability. A Position Paper of International Experts, 2003.
• ICRP:
o Radiation Protection Principles for the Disposal of Solid Radioactive Waste, vol. 15 no.4, 1985.
o Radiological Protection Policy for the Disposal of Radioactive Waste, Vol. 27, Supp., 1997.
o Radiation Protection Recommendations as Applied to the Disposal of Long-lived Solid Radioactive Waste, Vol. 28, no. 4, 1998.
o Recommendations of the International Commission on Radiological Protection, Vol.21, No.1-3, 1990.
• OECD, NEA:
o Radioactive Waste Management. Stepwise Approach to Decision Making for Long-term Radioactive Waste Management. Experience, Issues and Guiding Principles, No. 4429, 2004.
o Public Information, Consultation and Involvement in Radioactive Waste Management. An International Overview of Approaches and Experiences, 2003.
o The Regulators Evolving Role and Image in Radioactive Waste Management. Lessons learned within the NEA Forum on Stakeholders Confidence, 2003.
• EURATOM:
o Council Directive 96/29/EURATOM of 13 May 1996, laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation.
o European Commissions recommendation on Classification for Solid Radioactive Waste, 1999.
o Council Resolution of 19 December 1994 on radioactive waste management.
• UN:
o UN Convention on access to Information, Public, Participation in Decision Making and Access to Justice in Environmental Matters, 1998.

Seq. No	Country	Article	Ref. in National Report
15		Article 11	Section H, pp.13-14

Question/ Comment	According to the national report a “Basis for Decision” is prepared regarding final disposal of low and intermediate level waste. After the “decision” has been taken, what role will EIA play regarding public participation and questions concerning e.g. alternative designs and sites?
Answer	The final decision according to site and design will not be taken until after the EIA and public hearings. The EIA will contain several alternatives of both sites and designs.

Seq. No	Country	Article	Ref. in National Report
16		Article 11	Section H, pp.13-14

Question/	The ”Basis for Decision” concerning the above mentioned disposal should now have

Comment been presented for the Danish Parliament. Could Denmark elaborate a little more on the content of the document and also report the outcome of the presentation of the document to the Parliament?

Answer The Working Group, consisting of members from relevant authorities, has basically finished a draft “Basis for Decision”. The draft will be formally finalized upon a clearance within the Government. Hereafter it will be presented to the Parliament, in the fall 2006. In addition the plan is to have a public hearing of the “Basis for Decision” during the summer of 2006.

Seq. No	Country	Article	Ref. in National Report
17		Article 13	Section H

Question/ Comment The actual decision of establishing a repository has not been made now. Is there no time limit for starting the operation of a final repository for LILW. If not, how is the conditioned and unconditioned waste stored for a long period of time and regarding waste drums what kind of measures are planned to solve the corrosion problems within a long-time period ?

Answer In the original Parliament decision (B48, 2003) for the decommissioning of the research reactors it was stated that the area of the nuclear installations should be transformed to green-field within 20 years. To meet this time-schedule, the repository has to be ready some years in advance. Due to the ongoing political and public process no deadline can be finally set. The present Waste Management Plant and storage facilities have been in operation for more than 40 years. The storage of the waste for an additional 15 years will be regulated by the Nuclear Regulatory Authorities within the Operational Limits and Conditions including stipulating standards for waste drums.

Seq. No	Country	Article	Ref. in National Report
18		Article 13	p. 14

Question/ Comment How would a site for future radioactive waste treatment plants (not repository sites) be selected?

Answer This issue has not yet been finally decided. However, it could seem reasonable from a technical point of view to establish a radioactive waste treatment plant relatively near or on the premises of a future repository. Further investigations including considerations regarding transport of radioactive waste has to be carried out. Until a new waste treatment plant is established the existing Waste Management Plant at Danish Decommissioning will be operational.

Seq. No	Country	Article	Ref. in National Report
19		Article 13	

Question/ Comment What are the plans for disposal of radioactive waste in your country? When and what repositories could be built?

Answer In the original Parliament decision (B48, 2003) for the decommissioning of the research reactors it was stated that the area of the research reactors should be transformed to green-field within 20 years. To meet this time-schedule, the repository has to be ready some years in advance. Due to the ongoing political and public process no deadline can at present be finally set and no repository design has yet been finally decided.

Seq. No	Country	Article	Ref. in National Report
20		Article 16	

Question/ Section H; Safety of Radioactive Waste Management – Article 16: How does the practice

Comment of managing radioactive waste with respect to the new storage facility comply with the requirements of this article?

Answer The licence to operate the new storage facility is based upon the 2002 Environmental Impact Assessment and the safety assessment which included data and computer simulations of the planned construction of a new storage facility. The relevant procedures and requirements as expressed in Article 16 have been implemented in the Operational Limits and Conditions for Danish Decommissioning. In addition a more detailed assessment of the specific construction including: functionality, floor load capacity, escape routes, dose rates at various operations inside and outside the facility, inspection routines, expansion possibilities, etc., has been performed.

Seq. No	Country	Article	Ref. in National Report
21		Article 17	

Question/ Comment Information should be presented to support the conclusion that Article 17 (institutional control) is implemented.

Answer It is still too early to describe exactly how the implementation of Article 17 (Institutional measures after closure) will be ensured, since the Parliament decision of establishing a repository has not yet been made.

Seq. No	Country	Article	Ref. in National Report
22		Article 19	

Question/ Comment Section E; Legislative and Regulatory System – Article 19: Which international and/or national standards or guidance material does the Nuclear Regulatory Authority use as a basis for developing its Operational Limits and Conditions for Danish Decommissioning? (For example IAEA RS-G-1.7 and EC RP-113 are noted as used for determining values for clearance.)

Answer The following requirements, guides and standards were used as a basis for developing the Operational Limits and Conditions for Danish Decommissioning: 1) IAEA, Safety Guide No. WS-G-2.1, Decommissioning of Nuclear Power Plants and Research Reactors, 2) IAEA, Safety Guide No. 35-G1, Safety Assessment of Research Reactors and Preparation of the Safety Analysis Report 3) National Board of Health Order no. 823 of 31 October 1997 on dose limits for ionizing radiation, 4) Ministry of the Interior and Health Order no. 192 of 2. April 2002 on exemptions from law on the use of radioactive substances, 5) DS/EN ISO/IEC 17025 General requirements for the competence of testing and calibration laboratories, 6) IAEA, Safety Guide No. RS-G-1.7, Application of the Concepts of Exclusion, Exemption and Clearance, 8) EU Radiation Protection 113, Recommended radiological protection criteria for the clearance of buildings and building rubble from the dismantling of nuclear installations, 2000, 9) EU Radiation Protection 114, Definition of clearance levels for the release of radioactively contaminated buildings and building rubble, 2000, 10) IAEA, Safety Requirements No. WS-R-2, Predisposal Management of Radioactive Waste, Including Decommissioning.

Seq. No	Country	Article	Ref. in National Report
23		Article 19	Annex B, page 18

Question/ Comment Both of the Acts relevant to spent fuel and radioactive waste came into force over 40 years ago. Have they been amended in the light of developments in radiation safety and waste management procedures? Is the list of Orders from the National Board of Health a list of amendments to the Acts?

Answer The Acts relevant to spent fuel and radioactive waste are both very general. The Orders

are established in pursuance of the Acts and have been continuous revised in the light of developments in radiation safety and waste management procedures. In addition mandatory revisions of the Orders have been made due to implementation of several directives from the Council of the European Union. Operational Limits and Conditions for Danish Decommissioning, stipulated in the Nuclear Installations Act, is a very efficient and direct legal tool, which may be changed on a short notice taking into account the latest relevant developments on the decommissioning site as well as the latest national and international recommendations/requirements.

Seq. No	Country	Article	Ref. in National Report
24		Article 20	Section E Page 6

Question/ Comment: Could Denmark provide some more information about the sharing of responsibilities between the Nuclear Regulatory Authorities?

Answer: The Nuclear Regulatory Authorities are the National Institute of Radiation Hygiene under the National Board of Health and the Nuclear Division under the Danish Emergency Management Agency. The authorities have issued the existing Operational Limits and conditions for the nuclear facilities and have the responsibility for licensing revised rules, permits and inspections as required during the decommissioning process.

In practice the considerations related to the operation of the nuclear facilities have been conducted and settled by the Nuclear Division after consulting the National Institute of Radiation Hygiene. Opposite the considerations related to radiation protection have been conducted and settled by the National Institute of Radiation after consulting the Nuclear Division. This practice has been going on with no problems for more than 30 years. Denmark has not seen any conflicts related to the status of two Nuclear Regulatory Authorities sharing responsibilities.

Seq. No		Article	Ref. in National Report
25		Article 20	Section F Page 7

Question/ Comment: Could Denmark provide data on human resources available for regulation and technical supervision of the nuclear facilities (independent from the licensee organizations)?

Answer: At the Nuclear Regulatory Authorities 5 senior specialist are available for regulation and technical supervision of the nuclear facilities including the regulatory work with the decommissioning process and the process leading to a final repository.

Seq. No	Country	Article	Ref. in National Report
26		Article 20	11

Question/ Comment: There is a brief discussion on training expectations regarding the decommissioning employees under the National Regulatory Authority. However, other sections within the report do not discuss the competencies required of the different functions within the regulatory body. How does the Danish government ensure that there are appropriate competencies and training for the employees that serve in the regulatory capacity?

Answer: Employees at the National Regulatory Authorities serving in the regulatory capacity all as a basis have a university degree in science. They are all, as part of their daily work, involved in relevant seminars or symposia as well as international committees and working groups.

Seq. No	Country	Article	Ref. in National Report
27		Article 22	

Question/ Is there fund for the management of radioactive waste in Denmark or there is a special

Comment line in the state budget for this?

Answer There is not a fund for the management of the radioactive waste. The expenses for the management of radioactive waste are covered by the state budget (§19.51.10.30), covering Danish Decommissioning that operates the Waste Management Plant. Danish Decommissioning is an institution under the Ministry of Science, Technology and Innovation. It is thus a national matter to provide adequate resources for the management of radioactive waste.

Seq. No	Country	Article	Ref. in National Report
28		Article 22	A9

Question/ Comment There is a brief discussion on competencies and educational programs for employees under Riso National Laboratory. How does the National Regulatory Authority ensure that there are enough staff and that the staff has appropriate competencies to perform their safety-related functions?

Answer Employees at the National Regulatory Authorities serving in the regulatory capacity all as a basis have a university degree in science. They are all, as part of their daily work, involved in relevant seminars or symposia as well as international committees and working groups.

Seq. No	Country	Article	Ref. in National Report
29		Article 24	

Question/ Comment Section F; Other General Safety Provisions – Article 24: With regard to Table 6; are these the only radionuclides of concern discharged in liquid from the facility?

Answer These are the only nuclides of concern. However, it is a provision in the Operational Limits and Conditions for Danish Decommissioning that the Nuclear Regulatory Authorities are informed if discharge of other nuclides is detected or expected, and that Danish Decommissioning justifies a proposed discharge limit. A discharge limit for the relevant nuclide will then ultimately be set by the Nuclear Regulatory Authorities.

Seq. No	Country	Article	Ref. in National Report
30		Article 24	

Question/ Comment Could you provide some data on workers´ exposure related to the SF&RW management (average individual dose, collective dose, comparison to the total collective dose of the whole nuclear installation)?

Answer 2004:
Highest annual individual effective dose related to SF and RW management: 3.3 mSv
Average individual dose related to SF and RW management: 0,19 mSv
Collective dose related to SF and RW management: 6.7 manmSv
Collective dose for the whole nuclear installation, including a non-nuclear facility producing isotopes for medical use: 22.7 manmSv

2005:
Highest annual individual effective dose related to SF and RW management: 0.9 mSv
Average individual dose related to SF and RW management: 0,05 mSv
Collective dose related to SF and RW management: 3.4 manmSv
Collective dose for the whole nuclear installation, including a non-nuclear facility producing isotopes for medical use: 18.3 manmSv

Seq. No	Country	Article	Ref. in National Report
31		Article 24	

Question/ Comment: What is the typical dose constraint for the public exposure due to discharges from nuclear facilities?

Answer: For the decommissioning of the nuclear installations and for continued operation of the Waste Management Plant during the decommissioning work a dose constraint of 0.05 mSv/year for individual installations and a dose constraint of 0.1 mSv /year for the nuclear installation as a whole are stipulated in the Operational Limits and Conditions. Annual discharge limits stipulated in the Operational Limits and conditions are based on a reference dose of 0.05 mSv/year to a critical group of the population.

Seq. No	Country	Article	Ref. in National Report
32		Article 24	Section F, p.8

Question/ Comment: On page 8, it says “the mandatory radiation surveillance program covers all relevant decommissioning operations”. What does the surveillance program include during the decommissioning stage and for how long is the program planned to go on?

Answer: The radiation surveillance program will continue until the decommissioning is completed. The general principles for the radiation surveillance program in relation to decommissioning are similar to those applied during operation of the facilities (in pursuance of the Danish radiation protection legislation), and the more specific requirements in relation to decommissioning are specified in the Operational Limits and Conditions for Danish Decommissioning. The Operational Limits and Conditions for Danish Decommissioning comprise a number of general provisions on the number, function, calibration and quality of air and dose rate monitors necessary to analyse all present radionuclides that may present a risk to safety during the decommissioning of the nuclear facility. More detailed provisions require that the radiation surveillance program is clearly described in all decommissioning plans at all levels, e.g.: General decommissioning plans or step-by-step dismantling operation plans. The individual dismantling operations are furthermore subject to continuous evaluation with respect to radiation and conventional safety and must be optimized, changed or aborted accordingly. Dose rates, surface and air contamination at the individual nuclear facilities under decommissioning shall be monitored continuously or at regular intervals and intervention levels and intervention plans shall be in place.

Seq. No	Country	Article	Ref. in National Report
33		Article 25	Annex A-11

Question/ Comment: What is the relation (responsibilities) between the Minister of Interior and Health and the Danish Emergency Management Agency? Who is responsible for National Radiological Emergency Planning and who is responsible for decision making?

Answer: In their function as Nuclear Regulatory Authorities towards nuclear installations, including storages for radioactive waste, the Danish Emergency Management Agency refer as the National Institute of Radiation Hygiene to the Ministry of the Interior and Health. As for National Nuclear Emergency Planning, the Danish Emergency Management Agency refers to the Ministry of Defence.

The Danish Emergency Management Agency is responsible for national nuclear emergency planning, including emergencies at nuclear installations. The National Institute of Radiation hygiene is responsible for preparedness and response in the case of non-criminal radiological incidents and maintains a 24-hour emergency telephone service with a radiation protection officer on duty. For a criminal radiological incident - a

terrorist attack – the overall plan for decision making is described in the National Plan of Preparedness and Response.

Seq. No	Country	Article	Ref. in National Report
34		Article 25	SectionF/Annex A

Question/ Comment: Could Denmark provide more details on the following issues in relation to the Danish nation-wide nuclear emergency plan:
How often is the emergency plan tested and at which level (local/national/international)? Do you practice and train with the purpose to test the co-operation and the respective roles and distribution of responsibility between the different involved parties and between the different levels of organisation? Does the plan include a strategy on how to inform the public and media in an adequate and coherent way in case of an emergency?

Answer: Since the frequency of exercises is not defined in writing for all levels and scopes, the number of annual exercises varies.
Local exercises are conducted approximately once a month. These involve local measurement teams in the Danish Emergency Management Agency. Approximately 3-6 times a year the Nuclear Division takes an active role in initiation and responses to the local exercises.
National exercises involving training of the corporation between authorities and distribution of responsibility are conducted every second year in the Danish Emergency Management Agency. The involvement and role of the Nuclear Division varies from exercise to exercise.
On an international level Denmark participates as observer in many exercises. Due to lack of resources participation in international exercises such as Convex 3 has often been in minimal mode in recent years.
Replies to questions regarding exercises submitted to Denmark under the 3rd review meeting of the Convention on Nuclear Safety, 11-22 April 2005, are included below.
The "Plan for the Danish Nationwide Nuclear Emergency Preparedness" includes a description of the principles for public information. In the Danish Nuclear Emergency Preparedness the central emergency command takes care of information to the public, media and the press. In case of activation of the Danish Nuclear Emergency Preparedness, journalists from The Danish Broadcasting Corporation and Ritzaus News Agency will be affiliated to the central emergency command directly. Finally, question/answer services can be activated in few hours if required for telephone enquiries from the general public, and web-servers are prepared to provide online access to information.

Seq. No	Country	Article	Ref. in National Report
35		Article 26	Section A and F

Question/ Comment: Does the cost coverage for Danish decommissioning program also include waste conditioning and storage costs? Are the costs for later storage in a final repository also included in this Parliamentary Decision B48? Was a special fund raised for this purpose?

Answer: The cost coverage for the Danish Decommissioning program includes waste conditioning and temporary storage costs.

The costs for later disposal in a final repository are not included in the Parliamentary Decision B48 and a special fund for this purpose has not been raised. The decision of B48 was to initiate the process of preparing a »Basis for Decision« concerning a Danish disposal facility for LILW. The decision of actually establish a final repository has not

yet been made by the Parliament.

Seq. No	Country	Article	Ref. in National Report
36		Article 26	Pp 10-11

Question/ Comment: Within the Operational Limits and Conditions for Danish Decommissioning activity levels for clearance of solid material and buildings have been set out. Have you also established criteria for removal of control for previously regulated land?

Answer: There is presently no international guidance material that suggests nuclide specific criteria for the release of land from regulatory control. Land which may be released from regulatory control is for each part subject to an individual evaluation by the Nuclear Regulatory Authorities as specified in the Operational Limits and Conditions for Danish Decommissioning. Such an evaluation will be founded on the internationally recommended dose criteria. From the operational records the Nuclear Regulatory Authorities anticipate, that all sites used for the nuclear practices can be released without restrictions after final decommissioning.

Seq. No	Country	Article	Ref. in National Report
37		Article 26	

Question/ Comment: To which extent foreign companies are involved in the decommissioning activities. Are there sufficient local resources?

Answer: Physical decommissioning operations (demolition of DR 1) have been carried out by Danish Decommissioning personnel and/or Danish contractors up to now. For specific skills not available in Denmark or when specific operations require an EU Tender, foreign companies may be involved in the decommissioning activities.

Seq. No	Country	Article	Ref. in National Report
38		Article 26	Section F, p.12

Question/ Comment: It says in the report that ”requirements regarding records of information important to decommissioning are set out in Operational Limits and Conditions for Danish Decommissioning” and that, among other things it is required that ”two physically separate archives containing technical details, building plans, protocols of operation and correspondence exist for each nuclear facility”. How is it assured that both archives are brought up to date?

Answer: The individual project managers, who are responsible for the day to day decommissioning of each of the nuclear facilities, also have the responsibility to ensure, that the archives are updated as the decommissioning progresses. According to the Operational Limits and Conditions Danish Decommissioning shall establish and maintain a quality assurance system for the entire process of decommissioning, including record keeping; based on the DS/EN ISO 9001, version 2000.

The Nuclear Regulatory Authorities can at inspections verify that both archives are brought up to date.

Seq. No	Country	Article	Ref. in National Report
39		Article 27	

Question/ Comment: What laws and administrative arrangements has your country put in place to address the authorised transboundary movement of spent fuel and radioactive waste under Article 27.1.(1)H of the Convention .

Answer: No additional administrative arrangements have been put in place to address Article 27.1

of the Joint Convention. However, as stated in the Danish report, negotiations between the Member States of the European Community regarding the proposal for a Council Directive on the supervision and control of shipments of radioactive waste and spent nuclear fuel specifically addressing Article 27, take place.

Seq. No	Country	Article	Ref. in National Report
40		Article 28	

Question/ Comment: Section J; Disused Sealed Sources – Article 28: What is the status of the National Board of Health/National Institute of Radiation Hygiene plan concerning industrial gamma radiography installations and the use of sealed radioactive sources in industry, hospitals and laboratories? How does this plan contribute to or ensure compliance with the requirements of this article?

Answer: The National Board of Health/National Institute of Radiation Hygiene has issued Order no. 308 of 24 May 1984 concerning industrial gamma radiography installations and Order no. 918 of 4 December 1995 on the use of sealed radioactive sources in industry, hospitals and laboratories. These Orders implement all obligations under Article 28 of the Convention ensuring that the possession and storage of disused sealed sources take place in a safe manner. The orders stipulate requirements for granting authorisation including demands on possession, returning to manufacturer and storage of disused sealed sources. There is at present no disposal facility in Denmark for disused sealed sources.

Denmark has exported only a few equipments originally produced in Denmark but mounted with sealed sources produced outside Denmark. The total amount is less than 20. Denmark has until now never received any request for re-entry of these equipments. Due to the small number of these equipments no criteria for accepting or rejecting such a request has formally been made.

Seq. No	Country	Article	Ref. in National Report
41		Article 28	p. 15

Question/ Comment: While section J refers only to planned amendments, what measures are in place in Denmark to prevent illicit trafficking of spent sources or more general orphan sources (gate monitors at foundries, landfill sites, at borders, harbours etc.)?

Answer: All practices in Denmark involving sealed radioactive sources requires authorisation. Based on these authorisations the National Institute of Radiation Hygiene maintains a database including detailed information on all users and all licensed sealed sources. The National Institute of Radiation Hygiene cooperates with the Traffic Department at the National Police in recurring campaigns at our national borders. The Central Customs and Tax Administration launches in April 2006 a screening program with mobile equipment for containers arriving at Danish harbours. In addition equipment for detecting gamma radiation is mounted on the screening facility. Gate monitors are on voluntary basis placed at several facilities for recycling. There are no legal requirements stipulating such monitoring.

Seq. No	Country	Article	Ref. in National Report
42		Article 28	

Question/ Comment: It is stated that ,,Necessary changes will be made to the existing requirements. The changes will include requirements for financial security and requirements for physical security for high activity sealed sources".
Can you clarify what financial security mechanism for the high activity sealed sources is

proposed or have been already implemented? Does it cover only management of the disused high activity sealed sources or the decommissioning of the facility and management of all sealed sources?

Answer: The system for financial security for high activity sealed sources has not yet been finally decided. A proposal based on a system with a fund including all sealed sources is at present discussed with the Ministry of the Interior and Health. The Danish state guarantees the financial security if the responsibility for recovered orphan sources cannot be finally placed by a former user.

Seq. No	Country	Article	Ref. in National Report
43		Article 28	

Question/Comment: Is the requirement either to return disused sources to manufacturer or send them to Waste Management Plant to Riso still valid or do you have new requirements for handling of new sources imported to the country in our days (for example only return to manufacturer in order to minimise the quantity of radioactive waste in the country)?

Answer: The requirements for handling disused sealed sources will not be changed for sealed sources in the Categories 2, 3, 4 and 5. For Category 1 sealed sources additional requirements are planned, including requirements on binding agreements between the licensee and the manufacturer securing return of imported Category 1 sources to the manufacturer abroad after the final use.

Seq. No	Country	Article	Ref. in National Report
44		Article 28	Section J, p.15

Question/Comment: How is the Council Directive on High Activity Sealed Sources (2003/122/Euratom) implemented in the legislative and regulatory system? It would be of particular interest to be informed how art. 3 para 2 (b) has been implemented (financial security or any other equivalent means) and to what extent implementation of the requirements in art 9 para 3 and 4 has been made (systems aimed at detecting orphan sources and campaigns to recover orphan sources left behind from past activities)?

Answer: The system for financial security for high activity sealed sources has not yet been finally decided. A proposal based on a system with a fund including all sealed sources is at present discussed with the Ministry of the Interior and Health. With respect to campaigns organised to recover orphan sources left behind from past activities mandatory annually fees regarding practices involving radioactive material were introduced in 1999. Since then each holder of a license has had to pay in accordance with the actual inventory of radioactive sources and the activities. Introducing this system has urged holders of radioactive sources to go through their stock and subsequently transfer sources not in use to the Waste Management Plant or to the original manufacturer and thereby reduce the risk of generating orphan sources. With respect to campaigns for recovering orphan sources, there are plans for announced and unannounced surveys at recycling facilities. The surveys will be made in cooperation with the Danish Emergency Management Agency and will include use of car-borne gamma spectrometry.

Seq. No	Country	Article	Ref. in National Report
45		Article 28	16

Question/Comment: The report states that a survey will be conducted for orphan sources with mobile measuring equipment under the auspices of the Danish Emergency Management Agency. Does the survey program also include temporary and/or installed radiation detection monitoring in transportation and import/export pathways?

Answer At the present there are no plans to make regularly surveys at import/export pathways with car-borne gamma spectrometry. However, campaigns are recurrent carried out at borders in cooperation with the Traffic Department at the National Police. The Customs and Tax Administration launches in April 2006 a screening program with mobile equipment for containers arriving at Danish harbours. In addition equipment for detecting gamma radiation is mounted on the screening facility.

Seq. No	Country	Article	Ref. in National Report
46		Article 28	15

Question/ Comment The report states that re-entry for storage of disused sources originally produced in Denmark will be considered on a case-by-case basis. What criteria are used to guide decision making in accepting or rejecting requests for reentry and return of sealed sources to producers?

Answer Denmark has exported only a few equipments originally produced in Denmark and mounted with sealed sources produced outside Denmark. The total amount is less than 20. Denmark has until now never received any request for re-entry of these equipments. Due to this small number of relevant equipment no criteria for accepting or rejecting such a request has formally been made.

Seq. No	Country	Article	Ref. in National Report
47		Article 32	

Question/ Comment Section B; Policies and Practices – Article 32 (1):
a) Given the recent developments in decommissioning programs in Denmark, what are the new developments in radioactive waste management practices resulting from these programs?
b) Has there been a decision made regarding the management of spent fuel from DR 1 and the experimentally produced spent fuel (as mentioned in the 2003 National Report)?

Answer a) Lessons learned in the DR 1 decommissioning project including both recommendations on technical details as well as more conceptual concerns such as the importance of a “common understanding” of the project will be taken into account in the decommissioning planning for DR 2 and DR 3. In addition three new facilities for handling the decommissioning waste have been constructed: A laboratory for waste characterization and a laboratory for final characterization of waste that may be cleared and a storage facility for waste.

b) There has not yet been made any final decision regarding the management of spent fuel from DR 1 and the experimentally produced spent fuel.

Seq. No	Country	Article	Ref. in National Report
48		Article 32	

Question/ Comment Section D; Inventories and Lists – Article 32 (2): With regard to Table 4; has the decommissioning of secondary systems of DR 3 commenced and if so, at what stage is the decommissioning process?

Answer Although the decommissioning plan for DR 3 has not been submitted to the Nuclear Regulatory Authorities, Danish Decommissioning may be allowed to demolish some secondary systems situated in the reactor periphery under certain strict provisions. For instance the foundation of the original cooling tower, which was taken out of operation in 1979 and replaced by another cooling system, has been demolished and is now released from regulatory control. The pipe lines of the subsequent cooling system have also been

dismantled. Detailed plans of dismantling sequences of the DR 3 reactor are under preparation. Otherwise the decommissioning of secondary systems of DR 3 has not commenced.

Seq. No	Country	Article	Ref. in National Report
49		Article 32	page 3, Table 1

Question/ Comment: Without a detailed inventory of the fission product and actinide activities in the spent fuel it is difficult to carry out a detailed health impact assessment for these materials. Does such an inventory exist?

Answer: The isotope specific activities in the DR 1 core solution, March 2006:

Isotope Activities in GBq
Sr-90 60
Cs-137 70
Pu-238 1.6
Pu-239+240 0.2
Am-241 1.8
U-234+235+238 as uranyl sulphate 0.2

The isotope specific activities in the remains from post irradiation characterisation of experimentally irradiated fuel, March 2006:

Isotope Activities in TBq
Sr-90 370
Cs-137 380
Pu-238 11
Pu-239+240 4
Am-241 17
U-234+235+238 0.03

The activities are calculated from safeguards information and estimated mean values for burn-up. The total sum differs slightly from the values given in Table 1 in the national report due to revised estimated mean values for burn-up.

Seq. No	Country	Article	Ref. in National Report
50		Article 32	page 5, Tables 2 & 3

Question/ Comment: Without a detailed inventory of the fission product and actinide activities in the spent fuel it is difficult to carry out a detailed health impact assessment for these materials. Does such an inventory exist?

Answer: Tables 2
Isotope specific activities in the Storage Hall, March 2006:

Isotope Activities in TBq
Sr-90 1.9
Cs-137 2.3
Pu-238 0.1
Pu-239+240 0.04
Am-241 0.2

Isotope specific activities in the Drum Store and the Centralvejslager, March 2006:

Isotope Activities in TBq
H-3 23
Co-60 80
Ni-63 17
Cs-137 290
Sr-90 8
Pu-238 0.4
Pu-239+240 0.1
Am-241 1.9

H-3, Co-60, Cs-137 and Am-241 are mainly from storing of disused sealed sources.

The uranium extraction materials in taillings and remaining untreated ore contain 25 GBq Ra-226, 50 GBq Th-232 and 50 GBq uranium isotopes.

Seq. No	Country	Article	Ref. in National Report
51		Article 32	Annex A-10

Question/ Comment: "gross â/ã-activity" – what does the reference to ã mean here?

Answer: As stated the release of dissolved gross beta/gamma activity from the Waste Management Plant is less than 0.2 GBq/year. Gamma is mentioned because the part of gross beta not related to Ka-40 is conservatively considered to be Cs-137.

Seq. No	Country	Article	Ref. in National Report
52		Article 32	Annex A-10

Question/ Comment: 1999 tritium release?
Are there legal and/or regulatory requirements to assess the impact of such releases on the environment and on human health? If so, a reference to these requirements would be a useful addition to the report.

Answer: The Operational Limits and Conditions for Danish Decommissioning includes nuclide specific reporting levels for anomalous discharges to the atmosphere or to Roskilde Fjord. In 1999 was the requirement prompt reporting to the Nuclear Regulatory Authorities for expected or actual semi-annual releases exceeding ten times typical values over previous years. Reporting according to the "10-factor-rule" has never occurred, neither in 1999.

In 2004 new Operational Limits and Conditions for Danish Decommissioning were established. Release limits for tritium were with reference to the dose limits for members of the public of 0.05 mSv/y laid down to 1,000,000 GBq/year. Besides extraordinary reporting is required if the expected or actual release in a month exceeds 100 GBq.

There are no legal and/or regulatory requirements to assess the impact of such releases on the environment and on human health. However, the Nuclear Regulatory Authorities are empowered to claim such an assessment.

Seq. No	Country	Article	Ref. in National Report
53		Article 32	Section B+G

Question/ Comment: Considering the importance of international co-operations in RAW management through bilateral or multilateral mechanisms as stated in the IAEA Convention preamble, is there any plan to participate in such interest forums especially with countries not using NPP?

Answer: The importance of international co-operation in RAW management is recognised by Denmark. The National Institute of Radiation Hygiene, the Nuclear Division under the Danish Emergency Management Agency as well as relevant stake holders are active players in several international forums, such as EU, IAEA and NEA. In addition Denmark participates in Nordic working groups discussing RAW management. As for participation in forums especially with countries not using NPP Denmark is open minded. Participation in all forums is considered with regard to the scope of the group and the available human and financial resources.

Seq. No	Country	Article	Ref. in National Report
54		Article 32	Section D, p.5

Question/ Comment: It says in the report that lessons learned from the decommissioning of DR 1 are implemented in the current decommissioning plans for DR 2 and DR 3. It would be interesting to get some more information on what the lessons learned from the decommissioning of DR 1 actually was.

Answer: A detailed report of lessons learned in the DR 1 project includes both recommendations on technical details as well as more conceptual concerns such as the importance of a "common understanding" of the project (details below):
a) Technicians, health physicists, waste characterization group, safety group, quality management group etc., should be involved in the detailed planning of the individual decommissioning projects. This promotes a common understanding of the project and ensures a more robust, all-inclusive project plan.
b) The common understanding of project status/terminology is better maintained if personnel remain unchanged.
c) A careful study of all available information on the construction of the facility is essential.
d) Special care should be taken when cutting pipes which may still contain remnants of radioactive liquids.
e) Wet cutting produces cutting sludge which is neither easy to handle nor to get rid of. Consider alternative techniques.
f) Waste is hard to register in the same pace as it is produced.
g) Effective stowing of waste containers requires careful planning and sorting.
h) Continuous Air Monitoring is hampered by electromagnetic noise and moist.
j) Cold war legacy fall-out may disturb Ge-detector measurements of large surfaces such as walls and ceilings.

Seq. No	Country	Article	Ref. in National Report
55		Article 32	14

Question/ Comment: The Basis for Decision on disposal of LLW and LILW has been preceded by four Working Papers focusing on various aspects of safety and the environment. These Working Papers have been shared with the public in pursuit of transparency. Please provide additional information on the success of the public participation process, including issues and concerns expressed by the public. Please describe how public participation affected the direction of disposal policy.

Answer: The public participation process has included one hearing held in the summer of 2005.

Only very few participants attended this meeting although invitations were sent out broadly. The working papers were generally well received. Main issues of concern were expressed as questions to a proposed reference dose of 0.01 mSv/y for the critical group for the “expected” development of a repository, questions regarding sorting of long lived waste and questions on whether such sorting could influence the process. In addition, questions were raised concerning the present storage of already existing radioactive waste.

The public participation has made clearer to the authorities what the important issues for the public are.

Seq. No	Country	Article	Ref. in National Report
56		Article 32	3

Question/ Comment: The newly constructed storage facility for radioactive waste has two rooms, one of which will serve as a storage area until a final radioactive waste repository has been established. No date for operation of a final repository is provided. This implies the waste may be in storage for a long time. Please describe any special features the waste forms and storage facility may have that address the potential for extended storage.

Answer: The special features of the new storage facility have primarily been constructed in order to reduce the risks and effects of potential accidents. Long-term storage is not anticipated.

In the original Parliament decision (B48, 2003) for the decommissioning of the research reactors it was stated that the area of the nuclear installations should be transformed to green-field within 20 years. To meet this time-schedule, the repository has to be ready some years in advance. Due to the ongoing and not yet finished political and public process no deadline can be finally set. The present Waste Management Plant and storage facilities have been operated for more than 40 years. The storage of the waste for an additional 15 years will be regulated by the Nuclear Regulatory Authorities within the Operational Limits and Conditions including stipulating standards for waste drums.