SUNDHEDSSTYRELSEN
STRÅLEBESKYTTELSE

Joint Convention on the safety of spent fuel management and on the safety of radioactive Waste management

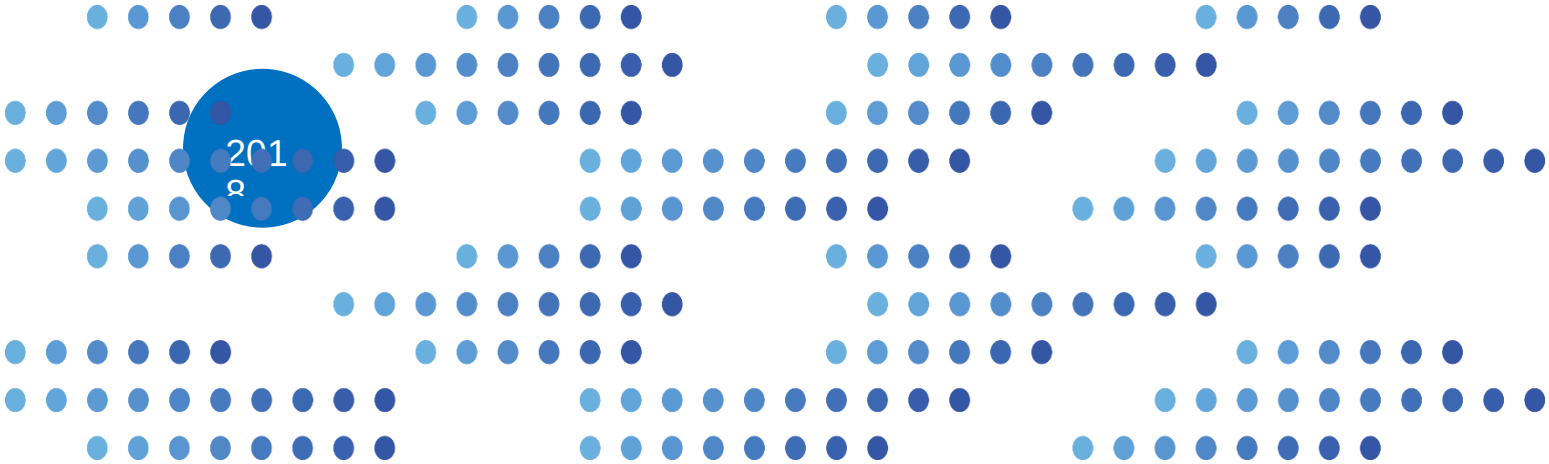
QUESTIONS AND COMMENTS TO THE

NATIONAL REPORT FROM THE UNITY OF THE REALM

DENMARK

GREENLAND

6TH REVIEW MEETING



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Joint Convention on the safety of spent fuels management and on the safety of radioactive Waste management

QUESTIONS AND COMMENTS TO THE NATIONAL REPORT FROM THE UNITY OF THE REALM

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Contents

Foreword

In October 2017 the Unity of the Realm submitted the Sixth National Report under the obligation of JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT[1].

Subsequently, the submitted National Report was circulated to Contracting Parties of the Joint Convention and to the observers invited under Article 33(2) of the Convention for reviewing.

This document presents answers to the questions and comments resulting from the review of the 6th National Report from Denmark. Questions are presented in such a way as to preserve the anonymity of the Contracting Party posing the question.

The questions to the National report from Denmark were answered by the Radiation Protection under the Danish Health Authority in co-operation with the Danish Ministry of Health, the Danish Ministry of Higher Education and Science, Danish Decommissioning and the Danish Emergency Management Agency.

The questions to the National report from Greenland were answered by the Greenland Environmental Agency for Mineral Resource Activities, the Ministry of Health, the Ministry of Mineral Resources and Safety Authority, Ministry of Industry, Labour, Trade and Energy, and the Ministry of Nature and Environment.

1 Questions and Comments

1.1 Question 1

Could you please explained why the conventions does not apply to the autonmous territories of Faroes islands while the territories are constutionally binded by danish foreing policy matters?

Is there any radwaste produced in the Faroeans territories that is managed in Danemark or Greenland?

Answer: The Faroe Islands are a self-governing community within the Kingdom of Denmark. By Act no. 578 of 24 June 2005 (the Takeover Act) supplementary to the Home Rule Act, the Faroe Islands' options to assume further fields of responsibility were considerably expanded.

Except from special areas, for example relating to human rights, it will normally be possible to accede to international agreements that exclusively affect Denmark, whereby the Faroe Islands may decide whether it wishes for the agreement in question also to apply in relation to the Faroe Islands.

The Faroese authorities are subject to the obligations that arise out of agreements under international law and other international rules applying to the Faroe Islands which are at any time binding on the Realm.

[1] https://www.sst.dk/~/media/509CCB144EC5489592F7345F998C92C1.ashx

It is possible to manage radioactive waste from the Faroe Islands in Denmark, but as of spring 2018, the Ministry of Health does not have knowledge of occasions where Denmark has done so.

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1.2 Question 2

Is there any dose limit for public in legislation or in the licence?

Comment: Releases of radioactive materials from the Waste Management Plant at the Risoe site are primarily liquid and originate in the radioactive wastewater distillation plant from which the purified liquids are transferred to the inactive waste water system and in turn into Roskilde Fjord. Since the reactors were taken out of operation, the release of tritium to Roskilde Fjord has been reduced by one to two orders of magnitude and now displays a declining trend below 100 GBq per year.

Answer: Danish Decommissioning is subject to comply with the Operational Limits and Condition for Danish Decommissioning. A dose constraint for the Risø site of 0,1mSv/y in total for the public is part of the Operational Limits and Condition for Danish Decommissioning. It is further stipulated that the contribution to the dose constraint form a single facility within the Risø site must be less than 0.05 mSv/y. These dose constraints to the public are issued in accordance with Order No. 84 of 2nd February 2018 on ionising radiation and radiation protection.

1.3 Question 3

What were the most significant changes to the nationwide nuclear emergency preparedness plan revision?

Answer: The 2014-plan is shorter and more focused on coordination between those authorities that have tasks in case of a nuclear emergency situation as well as for coordination mechanisms. According to the sector responsibility principle the various authorities are solely responsible for tasks within their area of responsibility on daily basis as well as in an emergency situation and thus coordination is a prime focus area.

1.4 Question 4

Who is responsible (administratively and financially) for orphan sources management?

Answer: The Danish Health Authority will administratively manage an orphan source, if such will occur, while handling and storage of an orphan source will be done by Danish Decommissioning at the Waste Management Facility at the Risø site. The cost of the handling will be covered by the state through a dedicated entry on the financial act enabling the Danish Health Authority to cover such costs. If an orphan source is found, the Danish Health Authority will initially use the Danish national data integration interface combining data for relevant individuals in Denmark with the Danish Central Business Register a tool to track the owners of a disused sealed sources if such occur as orphan sources. If the owner of the source is found he/she will be held responsible of the cost of handling of the source. If the owner cannot be identified the state takes over the responsibility.

1.5 Question 5

Who would physically perform the tasks to ensure the protection of the population as defined by the nationwide nuclear emergency preparedness plan in the case of an accident?

Answer: In Denmark, the sector responsibility principle ensures that any authority responsible for a given task on daily basis (non-emergency situations) holds the same responsibility for this task in an emergency situation. The authority responsible for – as an example – public health on daily basis holds the same responsibility in this area in an emergency situation. This goes for any authority and accordingly the nationwide nuclear emergency preparedness plan does not change the areas of responsibility as they apply on daily basis. The main focus of the plan is on coordination between authorities in an emergency situation.

In Greenland the sector responsibility principle is ensured by including the establishment of a general emergency plan and a specific nuclear emergency plan as a term in the exploitation/mining licenses, which needs to be approved by the Government of Greenland.

1.6 Question 6

Are there any emergency exercises in Denmark, or in Greenland taking places, to verify the tasks defined by the emergency plan? If so, how often?

Answer: Every two years a major exercise is conducted in Denmark for the most central emergency preparedness authorities. The scenario of the exercise varies. It could include a nuclear emergency situation as was the case of the exercise in 2015.

Smaller tabletop exercises involving authorities related to nuclear emergency situations are conducted on an almost yearly basis.

To date, no nuclear emergency preparedness exercise has been conducted in Greenland.

1.7 Question 7

Comment: On 15 December 2016, the Kingdom of Denmark withdrew its territorial declaration with regard to Greenland made upon acceptance of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

The Report of Greenland is seen as a standalone document, but is annexed to the Danish report.

Answer: The sixth national report from the Unity of the Realm as contracting party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management consists of equal contributions from both Denmark and Greenland. The Report by Greenland is a standalone document, despite the annexation. The introduction to the report from the Unity of the Realm states that: "*Given the extensive powers of Self-Government arrangements for Greenland, which include independent legislative competences in the fields of radiation protection and radioactive waste management, Greenland is thus under obligation to report independently to the Convention on the application of widely recognized principles and tools for high-quality safety management of radioactive waste*."

1.8 Question 8

Radioactive waste inventory: Twice in the report, the volume/mass is given with a circa sign (~). How accurate are these accountings? Are there more accurate figures or are these estimated values from calculations?

Answer: In Section D, table 3, the volume of waste in the Low Level Waste Storage is reported as ~ 1200 m3. The number is established by multiplying the number of stored drums with the outer volume of a standard waste drum. The way of calculation is believed to be the best way of establishing the waste volume for the Low Level Waste Storage.

In section D, table 4, the overall mass of the waste in the Drum storage and Centralvej Storage is reported as ~ 130 tons. The waste in the two storages is mainly historical waste which has not yet been finally characterized. For example, registrations of weight are insufficient. As a consequence the mass estimated for the Fifth National Report from Denmark (~ 127 tons) has been given with an addition of the mass of waste received, mainly from external users, in the period since 2015. Presently this is the most accurate figure existing.

1.9 Question 9

Spent fuel management policy: If Denmark decides in favour of the long-term storage option, are there any plans as to what kind of storage facility can be used and what the timespan is in which such a facility could start operation?

Answer: The Danish Government has proposed a long-term management policy which – if adopted by the Danish Parliament – will see the continuation of storage activities by Danish Decommissioning on the Risoe Peninsula. A new storage facility will be constructed to ensure safe management of Danish radioactive waste and spent fuel until 2073 by which year a repository solution must be established and approved for operations. The new storage facility at Risoe will be designed with the following key functions in mind:

- Sufficient capacity to store the Danish radioactive waste and spent fuel in the period 2023-2073, including additional waste to be received from users of radioactive sources within this timespan
- Sufficient protection against flood situations in Roskilde Fiord where the Risoe Peninsula is located
- Sufficient means to control temperature and humidity levels in the storage facility

Following the Danish Government's proposal to the Danish Parliament, the new storage facility is proposed to be constructed during the period 2018-2023. The storage facility will be planned

for operations to begin in 2023 on condition of the approval by Danish Nuclear Regulatory Authorities.

1.10 Question 10

Disused radioactive sources: In the National Report it is written that the Greenland Health Care System does not use sealed sources. Could Greenland please describe whether sealed sources are applied in industry and education and is there an accounting system in place?

Answer: In Greenland, no use of sealed sources within industry and education is on record. The development of a system for registration and licensing, pursuant of the Radiation Protection Act which entered into force 1st February 2016 is underway.

1.11 Question 11

Comment: Denmark is thanked for its detailed national report.

Answer: The comment is greatly appreciated.

1.12 Question 12

It is noted that the entire process of decommissioning including all radioactive waste management is accredited to ISO 9001. This is subject to bi-annual audits and a more comprehensive audit every third year by the Accreditation Body. Could Denmark give an indication of how compliant Danish Commissioning is with the above standard?

Answer: Danish Decommissioning is fully compliant with ISO 9001. The coverage of the system is “Decommissioning of the nuclear facilities at the Riso peninsula” according to the certificate. In more detail, the accreditation covers:

- Decommissioning, both dismantling and decontamination of the nuclear facilities to free release status.
- Handling and storage of radioactive waste.
- Maintenance of the nuclear facilities until decommissioning.

Receipt and storage of radioactive waste from external, Danish companies and institutions is not directly covered by the accreditation. However, the procedures and other relevant documents are managed in the same management system, and in practice external waste is handled in the same way as Danish Decommissioning’s own produced waste.

The most recent management system certificate (issued on 8th June 2017) certifies that Danish Decommissioning meets the demands of the DS/EN ISO 9001:2015 standard, which replaces the former 2008 version of the standard. The certificate is based on a more comprehensive audit to certify compliance with the new version of the standard.

1.13 Question 12

It is noted that in accordance with the Nuclear Installations Act (1962) Danish Decommissioning is subject to Operational Limits and Conditions in an authorisation by the Danish Health Authority Radiation Protection. Can Denmark outline how often does the Regulatory body inspect against the condition of this authorisation and how compliant is Danish Commissioning with the conditions of their authorisation and any other relevant legislation?

Answer: The Operational Limits and Conditions set for Danish Decommissioning sets specific limits on the day-to-day operations of the decommissioning activities such as for instance requirements to monitor radiation and contamination levels at specific facilities as well as requirements regarding predisposal management and storage of waste generated during decommissioning or received from other waste producers in Denmark. The Operational Limits and Conditions further include requirements for monitoring and control of discharges and environmental monitoring, emergency management etc. Danish Decommissioning reports on such activities as required in the Operational Limits and Conditions, and must also according to the conditions apply for permits to undertake specific decommissioning projects or subprojects, pre-specified in the overall decommissioning plan. The Nuclear Regulatory Authorities perform inspections through review of reports and applications and performs onsite visits and inspections 1-2 times per year related to routine operations, and additional 4-6 times per year related to specific decommissioning projects. Announced and unannounced inspections are also carried out on an ad-hoc basis.

The overall level of compliance is (among other topics relevant to safety) evaluated every three years by the Nuclear Regulatory Authorities and communicated to the responsible minister and the Danish Parliament. The conclusion of the last report covering the period from 2014-2017, was that the decommissioning activities are proceeding as planned, and maintaining a level of safety and radiation protection which is satisfactory.

1.14 Question 14

Can Denmark provide details as to whether there is an estimated time frame for when the long-term storage facility will be completed and operational?

Answer: Please refer to the reply to Question 8 above. Following the Danish Government's proposal for a long-term solution, to be decided by Danish Parliament in the spring of 2018, the commissioning of a new storage facility located on the premises of Danish Decommissioning is estimated to take place in 2022-2023.

1.15 Question 15

Can Denmark give an outline of what procedures are in place for dealing with an orphan source should one be discovered in Greenland and will Greenland have access to the Danish long-term storage facility should this be required?

Answer: No formal procedures between Denmark and Greenland have been established for managing the occurrence of orphan sources found in Greenland. There have been a small number of cases where disused sources still in the possession of the licence holder and originating in Greenland have been handed over to the Waste Management Facility at the Risø site, in order to prevent loss of regulatory control. Such movements have taken place in accordance with Danish law, requiring case-by-case approval by the Danish Health Authority upon application by Danish Decommissioning requesting permission to accept waste from a waste producer operating outside the Danish legislative domain.

Thus, there are no general procedures set up at Danish Decommissioning (DD) regarding receipt of radioactive waste from Greenland.

There are no provisions in the Danish Government's proposal for a long-term management solution for radioactive waste in Denmark, to establish formal agreements and procedures for accepting radioactive waste from Greenland at a future Danish long-term storage facility.

Greenland will develop a system for safe management of orphan sources.

1.16 Question 16

Comment: Areas of Good Performance/ Good Practice: The system of interfacing relevant individuals in Denmark with the Danish Central Business Register that allows a proactive and timely intervention by the authorities where companies holding radioactive sources have declared for bankruptcy, etc. This should minimise the possibility of sources falling out of regulatory control and allows for individual sources to be linked to their owners.

Answer: Denmark thanks for the suggestion of the Danish national data integration interface as an area of good performance/good practice.

1.17 Question 17

Comment: Challenges: The siting of a long-term storage facility may prove to be difficult as local buy-in may be difficult to achieve.

Answer: The Danish Government has proposed to continue the storage of radioactive waste at the present location of Danish Decommissioning on the Risoe Peninsula until a long-term disposal solution will be operational. Hence, there will be no need for a new siting process to localise a long-term storage facility. It is proposed to construct a new storage facility which will be designed for an operational period of up to 50 years, after which time a final repository must be ready and approved for operations by no later than 2073. The Danish Government has decided not to propose a long-term storage policy like the one pursued by The Netherlands. The comparatively limited Danish radioactive waste inventory and Denmark's status as a non-nuclear power nation have been found not to warrant a long-term storage solution for a time span of 100 years.

1.18 Question 18

Since the reference documents cited in para.H.3.2 are almost in Danish, could Denmark provide a description of these criteria?

Comment: For the preparation of the safety case of the long-term storage facility, the general safety criteria were laid out.

Answer: The principles for the protection of humans and the environment were presented in the report on "Safety, economy and operation for a Danish long-term storage facility for radioactive waste" from the supplementary long-term storage studies, available in English through the following link: http://www.dekom.dk/media/169966/langtidsmellemlager_rapport_eng.pdf

The general safety criteria referred to in the report are described on pages 10-12, and present dose constraints for operation of a long term storage facility of 0,1 mSv/y. After conclusion of the storage period, a dose constraint for a disposal facility has been set at 0,1 mSv/y during the operational phase, and 0,01 mSv/y after closure of the disposal facility. During the iterative process of building the safety case, more specific safety criteria will be developed within the framework of the above mentioned dose constraints.

1.19 Question 19

Have decommissioning plans for the present radioactive waste management facilities been prepared, updated and reviewed by the regulatory body?

Answer: At the Risø site the radioactive waste management facilities in operation are the last nuclear installations to be decommissioned. The decommissioning plans for the waste management facilities are being prepared by Danish Decommissioning, but are jet to be presented to the Nuclear Regulatory Authorities.

1.20 Question 20

Could Denmark explain who are the external waste producers and what type of waste do they produce?

Answer: External waste producers are the hospitals, laboratories, industry etc. as stated in the current report. These waste producers deliver between 2 and 6 tons of radioactive waste per year to Danish Decommissioning. The radioactive waste from the external producers range from radioactive substances or liquids and disused sealed sources and consumer products containing radioactive substances (ex. smoke detectors). In general, NORM-waste from the oil and gas industry is not accepted at the Waste Management Facility at the Risø Site.

1.21 Question 21

Why at page 6 has it been written that " *Knowledge and competence compiled in a very small group of people*"? It seems a contradiction.

Comment: It is mentioned that "After undergoing staff reductions and loss of staff in 2012, the Danish Health Authority, Radiation Protection has filled vacancies and formed new positions such that staffing is equivalent to pre-2012 levels.

Answer: The phrasing on page 6 refers to the challenges mentioned in the Rapporteur's Report for Denmark at the 2015 meeting, which have since been addressed as described in the present report. Since completion of the 6th review report, the Danish Health Authority, Radiation Protection has increased staff by another 20 %.

1.22 Question 22

Are there in Denmark any manufacturers of SRS?

Would Denmark allow re-entry of DSS according to art. 28 paragraph 2?

Answer: 1) Only weak sealed radioactive sources for educational purposes are manufactured in Denmark. 2) For disused sealed sources manufactured in Denmark, a return to Denmark will be allowed at the end of its lifetime.

1.23 Question 23

Could Denmark provide more details about on on-site emergency plans? Are they approved by the regulatory authorities?

Are off site emergency plans foreseen?

Are these plans (on site and off site) regularly exercised?

Are emergency plans in force to cope with emergency arising from foreign facilities?

Are bilateral agreements with neighbouring countries in force?

Answer: 1) The Operational Limits and Condition for Danish Decommissioning sets a framework for the on-site emergency plans, including manning as well as skills and training requirements. The licensee issues the detailed plans that are subject to special inspections.

Danish Decommissioning has emergency plans, including qualified staff on duty all day and night in case of on-site emergencies.

The emergency plans are activated when the following occurs:

- Release of radioactive materials to the surroundings (or risk of a release) from the nuclear facilities
- After events where external services are called in (fire service, police, emergency medical service etc.)
- Personal injuries with radioactive contamination
- Over-exposure from external radiation
- Over-exposure from intake of radioactive materials
- Failure on the technical installations at the nuclear facilities

The emergency plans are approved by the Nuclear Regulatory Authorities.

2) The nationwide nuclear emergency management plan also includes provisions to manage offsite effects in case of an accident at the site of the licensee.

3) The on-site emergency plans are exercised annually with participation of both the licensee and the Technical University of Denmark Risø Campus on the same site. These exercises are supervised by the Nuclear Regulatory Authorities.

4) A nationwide nuclear emergency plan is in force and copes also with emergency arising from foreign facilities. The main focus of the plan is on coordination between those authorities that have tasks in case of a nuclear emergency situation as well as for coordination mechanisms. The reader is also referred also to answers to questions 23 and 24.

5) There are bilateral agreements with all neighbouring countries having nuclear installations, as well as very close cooperation with the Authorities responsible for emergency management at the two nearest nuclear power plants (Ringhals and Brokdorf).

1.24 Question 24

Is the practice of transport of radioactive material (radioactive waste) subject to notification or authorization by registration or license?

Answer: Transboundary transports of radioactive waste and used fuel is subjected to notification in accordance with Directive 2006/117/Euratom. However, transport of radioactive waste within Denmark is not subject to notification or authorization, but the transports must be conducted in compliance with the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

1.25 Question 25

Is the implementation of the optimisation demonstrated by the operator in the documentation submitted for the license issue?

Answer: As stated under Article 24, (p. 34), the operational radiation protection program for Danish Decommissioning must comply with the regulations given in Operational Limits and Conditions for Danish Decommissioning. These refer to the Act No. 23 of 15th January 2018 on ionising radiation and radiation protection and pursuant orders, which specifically state the requirement for optimization.

1.26 Question 26

For members of the public and exposed workers, are effective and equivalent dose limits for specific organs and tissues established?

Answer: Yearly effective dose limits for exposed workers and the public is given in Order No. 84 of 2nd February 2018 on ionising radiation and radiation protection. This order also provides limits for equivalent doses to the eye, skin and extremities.

1.27 Question 27

Does the operator provide, in the licensing documentation, an analysis of the possible accident scenarios involving unplanned or uncontrolled releases and the assessment of the relevant consequences in terms of radiological impact on critical groups of people concerned, with the aim of establishing ad hoc corrective measures?

Answer: The Risø site is a nuclear research site under decommissioning, and none of the nuclear reactors are in operation. Danish Decommissioning is subjected to comply with the Operational Limits and Condition for Danish Decommissioning, hence description of each decommissioning project must be submitted to the Nuclear Regulatory Authorities for approval before being initiated. Safety and risk assessments are substantial parts of a decommissioning project, and includes both planned exposure and unplanned scenarios, involving critical groups where relevant.

In addition, work assessments plans for each step of decommissioning project must be submitted to the Nuclear Regulatory Authorities, before the decommissioning work is initiated. These plans include an evaluation of the radiological risks in relation to the decommissioning work, and how the radiological risks are managed. Evaluation of doses related to exposed workers and the public are included as well.

1.28 Question 28

Have specific clearance levels been established? If so, on which radiological criteria are they based?

Answer: Specific clearance levels have been established and these can be found in Order No. 85 of 2nd February 2018 on the use of radioactive substances. The Clearance Laboratory (F-lab) for decommissioning waste upholds an independent accreditation (ISO/IEC 17025), ensuring that clearance takes place according to the same radiological critieria.

The specific clearance levels established by the Danish Nuclear Authorities includemass-specific clearance, referring to IAEA Safety Guide No. RS-G-1.7, as well as surface-specific clearance referring in EU Radiation protection 113 are used. Harmonization of these clearance levels to ensure compliance with COUNCIL DIRECTIVE 2013/59/EURATOM of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, is underway.

1.29 Question 29

Does the competent authority perform any independent control on the measurements performed by operators for the verification of clearance levels?

To avoid dilution of the activity concentration in the materials to be measured for clearance, does the competent authority have established the quantity, in terms of volume or mass, for the measurement of the materials (metals, cement rubbles, soil,..)?

Answer: It has not been a practice for the Nuclear Regulatory Authority to perform independent verification measurements of measurements performed by the Cleareance Laboratory at Danish Decommissioning (the operator), as the Cleareance Laboratory holds an independent accreditation initially granted by DANAK in 2007. This was confirmed during the latest audit in 2016. The Clearance Laboratory for decommissioning waste was established by Danish Decommissioning in response to a requirement from the Regulatory Body, specifying quantities (volume and mass), as well as applicable methods to be employed in the clearance process.

The clearance levels for radioactive substances are given in Order No. 85 of 2nd February 2018 on the use of radioactive substances. § 14 in Order No. 85/2018 further stipulates that it is illegal to dilute radioactive materials in order to fulfil the level for exemption from licensing or notification.

1.30 Question 30

The report says that since the Fifth National Report was published, a total mass of 60 tons of material has passed the clearance criteria and has been released from regulatory control. How many tons of the material was reused or recycled?

Answer: The cleared materials - mostly concrete - have been reused.

1.31 Question 31

The issue of disused sealed sources being found in metal scrap was presented in your report. You prepared and distributed to the scrap dealers some advisory material. Have you published anything on your webpages or have you provided any “awareness raisings” so far? Have you also approached smaller entities/companies?

Answer: The Danish Health Authority published a Guideline on radioactive substances in metal scrap in 2002, which is available through the authority’s webpage (http://www.sst.dk/~/media/71F88AF5CEEA4E7FA043B9C8FC0F3E92.ashx). The guideline is intended for scrap dealers of all sizes. This guideline is currently under revision as part of implementing the new legislation. As soon as, the new version is ready, it will be available through the authority’s webpage. It will also be distributed through an e-mail directory directly to all registered the scrap dealers.

1.32 Question 32

Due to this prescribed responsibility of the private sector in such a sensitive area of security of the whole country, what is the possible relation/responsibility between the Ministry of Health and the Danish Emergency Management Agency? Who is responsible for the National Radiological Emergency Planning and who is responsible for decision making?

Answer: The sector based responsibility referred to under article 25 relates to the responsibilities of state entities and not private sector operators. The Danish Emergency Preparedness and

Response is organized in accordance with a standard coined the ""sector principle""; stating that the authority, company or institution in charge of a sector under normal conditions, is also responsible for that sector in case of a major accident or disaster. The sectorial responsibility covers all critical functions and tasks that are imposed by law, politically or administratively - including planning for the continuity of functions within the sector of responsibility if an extraordinary event occurs.

The Danish Health Authority, under the ministry of Health and the Danish Emergency Management Agency, under the Ministry of Defence are independent authorities, contributing to the emergency preparedness and response within different sectors of expertise.

In matters relating to radiation protection and safety concerning the nuclear facilities under decommissioning, the Danish Emergency Management Agency refers to the Minister of Health together with the Danish Health Authority.

With respect to nuclear accidents the Danish Emergency Management Agency, is responsible for the coordination of emergency plans for the various sectors and for the radiation monitoring and prognoses of atmospheric dispersion of radionuclides. On the basis of radiation monitoring data and prognoses, the Danish Health Authority is responsible for the assessments of risks to health and for recommendations with relevance to health for instance on distribution of iodine, staying indoors or evacuation.

As regards radiological incidents and accidents - other than nuclear accidents - the Danish Health Authority is responsible for planning, radiation monitoring and emergency management - as well as assessments and recommendations with relevance to health. For radiation monitoring tasks the Danish Health Authority may however request the assistance of the Danish Emergency Management Agency.

1.33 Question 33

Danish Decommissioning was certified according to ISO 9001 in June 2004 and implemented the requirements regarding IT security according to ISO 27001.

The Clearance Laboratory (F-lab) for decommissioning waste upholds an independent accreditation (ISO/IEC 17025) of the lab.

Are the requirements of IAEA standards related to the management systems also considered when establishing and implementing the management system?

Does the Danish legislation define what requirements should be considered when establishing and implementing the management system?

Answer: The Operational Limits and Conditions for Danish Decommissioning require that decommissioning tasks are planned and conducted with reference to IAEA publications (the reader is referred to Chapter 2 in Operational Limits and Conditions for Danish Decommissioning). Danish legislation does not define specific requirements to be considered when establishing and implementing a management system, but does require basic features of a management system to be in place, specifying roles and responsibilities of the operator. The management system has been subjected to inspections by the Nuclear Regulatory Authorities, and supplementary orders have been given regarding data security, in casu, concerning regular extra backup procedures.

1.34 Question 34

What kind of available techniques do you use for radioactive discharges of water?

Do you perform radiation monitoring of the marine environment?

What types of measures are carried out in the vicinity of the Roskilde Fjord in order to protect the population living there from radiation? Is radiation environmental monitoring of the water and fish carried out there?

Answer: Water from the waste water treatment plant is monitored for activity before the water is discharged to Roskilde Fjord.

The following analyses are performed for activity content in different types of samples:

- Air samples at the Risø site by gamma-spectroscopy (weekly)
- Rainfall samples at the Risø site by gamma-spectroscopy (monthly)
- Rainfall sample at the Risø site for tritium content (monthly)
- Sediment samples from Roskilde Fjord by gamma spectroscopy (annually)
- Water samples from Roskilde Fjord for tritium content (every third month)
- Water samples from Roskilde Fjord for Cs-137 content by gamma spectroscopy (annually)
- Grass samples at the Risø site by gamma spectroscopy (monthly)
- Grass samples outside the Risø site to a distance of 16 km by gamma spectroscopy (every third month)
- Sea plant samples from Roskilde Fjord by gamma spectroscopy (annually)
- Discharge water from the Waste Treatment Plant for total beta-activity (weekly)
- External radiation at the Risø site by scintillation counters and TL-dosimeters (annually).

1.35 Question

The report states “At the Waste Management Facility, Am-241 sources are taken out of the smoke detectors and stored in dedicated waste containers, ready for further management.

What is the ‘further management’ referred to? Do the arrangements also apply in Greenland, as the Greenland section of the report suggests that there no sources in Greenland?

To note, the Danish report is in two separate, back-to-back reports: one for Denmark and one for Greenland. This comment relates to Section J, Page 45 (Denmark), Section J, Page 23 (Greenland).

Answer: The Waste management Facility at the Risø site handles smoke detectors containing Am-241 sources collected in only Denmark. The term further management means that the Am-241 sources will be conditioned for further long-term storage in Denmark. However, DD is also looking into the possibility of reusing the Am-241 sources.

An update is ongoing in Greenland.

1.36 Question 36

Reference is made to the European Council Directive on the supervision and control of shipments of radioactive waste and spent fuel (Council Directive 2006/117/Euratom). Are any shipments also subject to an intergovernmental agreement under Article 4(4) of the European Council Directive on the safe management of spent fuel and radioactive waste (Council Directive 2011/70/Euratom)? If so, please provide details.

Comment: The Danish report states "The European Council has adopted Directive 2006/117/Euratom of 20 November 2006 on the supervision and control of shipments of radioactive waste and spent fuel. Denmark implemented this directive in Order no. 1175 of 25 December 2008 replacing Order no. 969 of 13 December 1993 on international transfer of radioactive waste. The directive and the Order cover all shipments of radioactive waste and spent fuel, whether it is intended for disposal or for reprocessing." No mention is made of Article 4(4) of Council Directive 2011/70/Euratom.

Answer: No shipments are subject to an intergovernmental agreement under Article 4(4) of the European Council Directive on the safe management of spent fuel and radioactive waste (Council Directive 2011/70/Euratom. As stated in Section G, Denmark has since the Fifth Review Meeting continued the search for an international solution regarding the spent fuel from the research reactor DR 1 and 233 kg of experimentally produced and irradiated spent fuel. Until now this effort has proven unsuccessful. Furthermore, in section H.2.3 it is stated that, in early 2015, the Ministry of Foreign Affairs reported that it did not consider the undertaking of export of the total inventory of radioactive waste realistic. It was found that technical issues, national legislation and/or political considerations in the countries explored presented major obstacles for the proposed export solution. However, should any such option become realistic and result in intergovernmental agreements under Article 4(4), such arrangements will be reported.

1.37 Question

Comment: The report states: *Two new bodies were created to accommodate public interest in the process towards a long-term solution for radioactive waste management: a Contact Forum and a Panel of Independent Experts*.

The Contact Forum was formed to facilitate regular interaction between key stakeholders in the process such as: concerned citizens' groups, environmental NGOs, representatives of local government agencies, radiation protection and emergency management authorities, Danish Decommissioning, Geological Survey of Denmark and Greenland and the Agency for Institutions and Educational Grants. The Contact Forum consists of 17 members who convene approximately every third month. Minutes of the meetings are made public on the website of the Ministry of Higher Education and Science.

The Panel of Independent Experts was formed to address the need in the public to get access to independent and scientifically vetted information on radioactive waste management. The panel consists of seven scientists from Danish universities, appointed by the Danish Council for Independent Research. The panel members cover the following disciplines: Nuclear Physics/Nuclear Energy, Radioactive Waste Management, Health Physics/Radiation Protection, Environment Assessment, Environmental Law, Public Governance, and General Ethics. The panel replies to questions raised by the public. Questions are invited every month, with replies to be submitted

by the panel in the following month. Questions and answers are posted on the website of the Ministry of Higher Education and Science.

This is considered good performance in involving stakeholders in the process towards a long-term solution for radioactive waste management.

Answer: The comment is acknowledged with thanks.

1.38 Question 38

The report states: *As described in the Guidelines regarding the Form and Structure of National Reports, (INFCIRC/604 rev. 3, 18 December 2014) duplication within the reporting, including repetition of former reports, should be avoided. At the same time it is stated that the report should be a stand-alone report. Consequently, Denmark has in this report decided to focus on what is considered highlights and new developments since the National Report from the Fifth Review Meeting. Readers wishing a more detailed description of the Danish practices and understanding of the development before 2015 will find the former reports as well as the questions and answers submitted via the homepage for the Joint Convention*.

The peer review process would be more effective if current – policies, practices, legislation, etc., were set out concisely in each report, without excessive referencing to previous reports.

Comment: Denmark's is the only report that says in a number of sections "read our previous reports…" For example on policy and practices (section B) it says "Please refer to the previous National Reports" and a couple of short paragraphs – the analogous section in the UK report is 22 pages. Section E (Legislative and Regulatory System) is also only one page (UK's is 26 pages).

Answer: Denmark acknowledges the comment regarding the format of the 6th National Report from the Unity of the Realm.

1.39 Question 39

The Panel of Independent Experts was formed to address the need in the public to get access to independent and scientifically vetted information on radioactive waste management. Please provide a perspective on the success of this Panel and stakeholder satisfaction with the process.

Answer: The Panel of Independent Experts has responded to 25 questions and comments from August 2016 till present (April 2018). The questions have been posed by environmental NGOs (11 questions), concerned citizens' groups (6 questions) and interested individuals (8 questions). Issues have ranged from legal conditions of radioactive waste disposal and technical definitions and practices of waste management to ethical considerations regarding burdens on future generations.

It is acknowledged by stakeholders that the present panel members were appointed by the Danish Council for Independent Research which operates at arm's length of the Danish Government. The composition of the panel has benefitted from interaction with stakeholders, resulting in the inclusion of a panel member specialising in ethics.

Stakeholder satisfaction with the process has been varied, as was to be expected. Some stakeholders would have preferred to have had specific foreign experts included on the panel. However, this would have collided with the principle of delegating the powers of appointment exclusively to the Danish Council of Independent Research. As an alternative, dialogue with foreign experts has been facilitated through the Contact Forum, as part of the Forum's meetings.

The combination of Contact Forum and the Panel of Independent Experts seems to have brought about a useful sphere of interaction since the dialogue between authorities and stakeholders appears to have become much less conflict-ridden and much more focused on exchanging genuine differences of opinion on the basis of a better understanding of the opponent's point of view.

1.40 Question 40

The report notes that a strategy for the management of disused sealed sources in the scrap metal industry is under development. Please elaborate on the management strategy being considered and the guidelines for handling disused sealed sources found in scrap metal.

Answer: The Danish Health Authority is currently working on a new guideline intended for scrap dealers of all sizes. The guideline will have specific guidelines on how to detect possible disused sealed source and radioactive substances in scrap and how to handle a disused sealed source and radioactive substances in scrap if found. The guideline will possible be accompanied by quick guide poster with the overarching guidelines on how to act combined with images of typical examples of sealed source found in scrap. The images of various sealed sources aim to give the workers a visual awareness and make them aware of when to be alert.

1.41 Question 41

Regarding Greenland, the Radiation Protection Act sets the framework for issuing executive orders. Executive Orders issued under the Act will be consistent with corresponding Danish legislation. Please provide a list of Executive Orders under development, a brief summary of each, and their anticipated completion dates.

Answer: A one-year project to update this list will be started up during 2018.

1.42 Question 42

Comment: Denmark is commended on its public involvement and engagement activities such as establishing a Contact Forum to facilitate regular interaction between key stakeholders, and establishing a Panel of Independent Experts.

Answer: The comment is greatly appreciated.

1.43 Question 43

Comment: The inclusion of Greenland's National Report in the Kingdom of Denmark National Report is welcomed.

Answer: The comment is greatly appreciated.