

Convention on Nuclear Safety

7th National Report by Denmark, November 2016

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A. Introduction

This report by Denmark presents to the 7th Review Meeting an overview on the present Danish nuclear policy, the present legislation and measures relating to Nuclear Safety – in particular the emergency planning framework.

Denmark signed the Convention on Nuclear Safety (hereafter “the Convention”) on 20 September 1994, the day it opened for signature. The Convention came into force for Denmark on 11 February 1999. As of September 2016 the Convention also applies to Greenland, but until further notice the Convention shall not apply to the Faeroe Islands. Greenland and the Faeroe Islands are self-governing communities within the Kingdom of Denmark.

In terms of the Convention neither Denmark, Greenland nor the Faeroe Islands possesses any nuclear installations.

Denmark has previously operated three research reactors, but in September 2000 it was decided to decommission the three Danish research reactors, DR1, DR2 and DR3 (DR for Danish Reactor).

While DR1 and the DR2 are fully decommissioned DR3 is currently under decommissioning. At present the reactor vessel and internals are being removed. The decommissioning is operated by the government body Danish Decommissioning. Danish Decommissioning is dedicated only to this function. The decommissioning of DR3 is expected to last at least throughout 2018.

Although these decommissioning activities are not covered by the Convention they will in the following be referred to where it is deemed appropriate.

Detailed reporting on the decommissioning activities is incorporated in the reporting to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (hereafter the Joint Convention).

B. Summary

Present Danish legislation specifically governing nuclear safety dates back to 1962 and 1976. Even though the legislation thus are of older date it is deemed to be sufficient in the present circumstances; in 1985 the Danish parliament adopted a resolution instructing the government to organise the public energy planning from the premise that nuclear power will not be used. This resolution is not since overturned and it is predicted not to be the case in the future.

Since the 6th Review Meeting new legislation with some relation to the nuclear safety-area has been adopted by the Danish Parliament. In December 2015 the Act for Greenland on the Control of Peaceful Exploitation of Nuclear Material was adopted in light of plans in Greenland on mining of rare earth metals and uranium. In autumn 2016 a bill on the physical protection of nuclear material will be presented to the Danish Parliament inter alia in the light of the entry into force of the amendment to the Convention on Physical Protection of Nuclear Material.

At the 6th Review Meeting one specific challenge for Denmark was identified in the Country Group session;

“To enhance competence of emergency management personnel by training and exercise.”

Since the 6th Review Meeting training and exercise has in fact been enhanced.

The Danish Emergency Management Agency has held two large exercises – CONTEX 14 and 16 – in the years 2014 and '16 respectively. The exercises covered various activities in the field of measurement and involved not only participants from the Danish Emergency Management Agency and other Danish authorities but also participants from a number of other countries – in particular from Nordic Countries, but also from Germany and Great Britain.

The Danish Emergency Management Agency is involved in many and various activities under the Nordic Cooperation Forum “NKS” (Nordic Nuclear Safety Research). The cooperation among the Nordic countries is a cornerstone in the emergency context and a number of activities under NKS also include training and exercise.

A large national exercise involving especially the primary emergency authorities was carried out in November 2015. In the basic scenario Denmark was affected by a disaster; a nuclear-powered ship collided with a large cargo ship in the sea Kattegat. The collision caused a chain of events that created a number of problems for society as a whole and the authorities were challenged with a number of specific tasks.

The subject training and exercise will be elaborated in chapter C under reporting on Article 16 – Emergency Preparedness.

An essential focus area, which was also highlighted at the 6th Review Meeting, is recruiting and training of new personnel in light of the absence of specific academic education in the area of nu-

clear installations as a consequence of the mentioned resolution adopted by the Danish Parliament in 1985 on the exclusion of nuclear power from the national energy mix. Recent recruitments however show that candidates with relevant skills are available, and with supplementary education and training the necessary qualifications can be achieved and maintained.

C. Compliance with articles 6 to 19

In this chapter it is reported how the obligations in each of the Articles 6 to 19 of this convention is fulfilled so far as they are applicable.

(a) General Provisions

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Article 6. Existing Nuclear Installations

Not applicable.

(In terms of the Convention the Kingdom of Denmark has no nuclear installations.)

(b) Legislation and regulation

Article 7. Legislative and Regulatory Framework

1. *Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations.*
2. *The legislative and regulatory framework shall provide for:*
 - (i) the establishment of applicable national safety requirements and regulations;*
 - (ii) a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a license;*
 - (iii) a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licences;*
 - (iv) the enforcement of applicable regulations and of the terms of licenses, including suspension, modification or revocation.*

The legislative framework governing nuclear safety and related radiation protection in Denmark include Act No. 170 of 16 May 1962 on Nuclear Installations; Government Order No. 278 of 27 June 1963 on Protective measures against Accidents at Nuclear installations; Act No. 244 of 12 May 1976 on Safety and Environmental conditions at nuclear installations etc.; Consolidation Act No. 660 of 10 June 2009 on Emergency Management (with subsequent changes); and Act No. 94 of 31 March 1953 on the use etc. of radioactive substances.

Licensing and inspection of nuclear installations in Denmark is regulated according to the Act on Nuclear Installations, 1962 and the Government Order on Protective measures against Accidents at Nuclear installations, 1963.

The Act on Safety and Environmental conditions at nuclear installations etc., 1976, was created in preparation of implementation of nuclear power in the national energy mix and the act should enter into force before construction of a nuclear power plant. In 1985 the Danish Parliament decided

though that in practice nuclear power should not be part of the Danish energy policy and thus shall not be a part of the national energy mix. Consequently only a part of the Act has entered into force.

The Act on Nuclear Installations, 1962, and the Government Order on Protective measures against Accidents at Nuclear installations, 1963, explicitly states that nuclear installations may be constructed or commissioned only upon license from the minister responsible for nuclear safety.

A license cannot be granted if the safety of the installation or other vital interests is questioned. Before a license can be issued the applicant must present a safety analysis report for approval by the Danish Health Authority and the Danish Emergency Management Agency. Nuclear safety regulation in Denmark is the joint responsibility of the Danish Health Authority, Radiation Protection, and the Danish Emergency Management Agency.

The safety analysis report must in a comprehensive way address all safety relevant issues related to the installation. E.g. it must include information on operational procedures as well as protective measures. A license granted is conditional and revocable.

Consequently to the resolution adopted by the Danish Parliament in 1985 instructing the government to organise the public energy planning from the premise that the nuclear power will not be used, no nuclear power plants will be licensed in the Kingdom of Denmark unless this resolution is overturned.

In the unlikely event that a nuclear power plant were to be licensed it must be expected that the legal basis should be changed; both Act No. 170 of 16 May 1962 on Nuclear Installations and Act No. 244 of 12 May 1976 on Safety and Environmental conditions at nuclear installations etc. should be replaced by new legislation. As existing legislation it would govern licensing and inspection of nuclear installations in the Kingdom of Denmark and will be expected to implement the highest international standards.

Article 8. Regulatory Body

- 1. Each Contracting Party shall establish or designate a regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 7, and provided with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities.*
- 2. Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.*

The nuclear regulatory authorities in the Kingdom of Denmark are the Danish Emergency Management Agency, Nuclear Division, and the Danish Health Authority, Radiation Protection, who are joint responsible for nuclear safety regulation and activities.

The Danish Health Authority is organised as an agency under the Ministry of Health. The Danish Emergency Management Agency (DEMA) is organised as an agency under the Ministry of Defence.

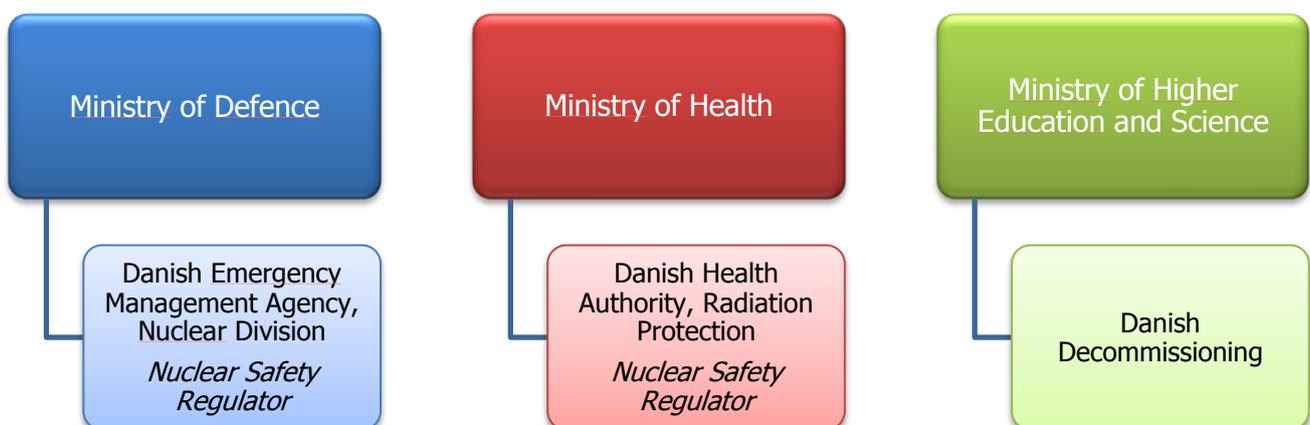
The Danish Health Authority, Radiation Protection, and the Danish Emergency Management Agency are also jointly competent authorities for safety related to decommissioning of the nuclear installations. The competent authority for radiation safety is the Danish Health Authority, Radiation Protection. The Danish Emergency Management Agency is the nuclear emergency preparedness and response authority.

Danish Decommissioning is responsible for the decommissioning of the three former research reactors in Denmark and also receives handles and stores radioactive waste from users of radioactive substances (e.g. industry, hospitals, universities) in Denmark. Danish Decommissioning is established as an institution under Ministry of Higher Education and Science.

As of matters regarding nuclear safety and related radiation protection, the activities of Danish Decommissioning are regulated by the Danish Emergency Management Agency, Nuclear Division, and the Danish Health Authority, Radiation Protection. This includes setting the safety requirements and execution of inspections.

DTU Nutech is the Danish national competence center for nuclear technologies. DTU Nutech continues the mission as Denmark's national competence centre for nuclear technologies from the former Risø National Laboratory. DTU Nutech is a part of the Technical University of Denmark. The former three research reactors were operated by Risø DTU Campus, National Laboratory for Sustainable Energy – a part of the Technical University of Denmark.

Figure 1; Structure of the Danish Nuclear Safety Organisation



The legislative, regulatory and administrative measures in the Danish regulatory system are adequate for the present situation in Denmark and are in compliance with the obligations of the Convention on Nuclear Safety. No additional steps are required in Denmark for implementation of the obligations under this Convention.

As of separation between the functions of the regulatory body – i.e. the Danish Health Authority, Radiation Protection, and the Danish Emergency Management Agency – and those of any other body or organization concerned with the promotion or utilization of nuclear energy, no body or organization (or other) are concerned with such promotion or utilization accordingly to the decision by the Danish Parliament to exclude nuclear power from the national energy policy. Bodies that draw up energy policy fall under the Danish Ministry of Energy, Utilities and Energy, and are in any case separated from the nuclear safety regulators.

Article 9. Responsibility of the licence holder

Each Contracting Party shall ensure that prime responsibility for the safety of a nuclear installation rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

Licensing and inspection of nuclear installations is regulated according to the Act on Nuclear Installations, 1962 and the Government Order on Protective measures against Accidents at Nuclear installations, 1963 – which explicitly states that nuclear installations may be constructed or commissioned only upon license from the minister responsible for nuclear safety (Ministry of Health).

The license is not granted if the safety of the installation or other vital interests is questioned. The applicant must present a safety analysis report for approval by the Danish Emergency Management Agency and the National Board of Health before a license is issued. The safety analysis report must in a comprehensive way address all safety relevant issues related to the installation; it shall include information on operational procedures as well as protective measures. The license is conditional and revocable and most probably also time limited.

As mentioned under reporting to Article 7 the Danish parliament in 1985 adopted a resolution instructing the government to organise the public energy planning from the premise that the nuclear power will not be used. Consequently there are no nuclear installations in the terms of the Convention in the Kingdom of Denmark and from this perspective, the Act on Nuclear Installations, 1962, and the Government Order on Protective measures against Accidents at Nuclear installations, 1963, have not been revised. If Danish energy planning were to change and include nuclear power, licensing of a nuclear power plant must be expected to require a change in the legal basis.

(c) General Safety Considerations

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Article 13. Quality assurance

Each Contracting Party shall take the appropriate steps to ensure that quality assurance programmes are established and implemented with a view to providing confidence that specified re-

quirements for all activities important to nuclear safety are satisfied throughout the life of a nuclear installation.

The obligations under Article 13 apply to nuclear installations. There are no nuclear installations in the terms of the Convention in the Kingdom of Denmark.

As of the activities concerning decommissioning of the former three research reactors under the responsibility of Danish Decommissioning these activities are subject to a comprehensive system for quality assurance of health, safety and environment. This quality assurance system is certified according to the DS/EN ISO 9001 standard, takes care of all aspects of decommissioning as well as general labour safety issues. The clearance laboratory of Danish Decommissioning is certified according to DS/EN ISO 17025.

This quality assurance system is audited by the certifying bodies and supervised and audited by the Danish Health Authority, Radiation Protection, and the Danish Emergency Management Agency, as well as other safety authorities being responsible for the non-nuclear part of the activities at the Danish Decommissioning.

Article 14. Assessment and verification of safety

Each Contracting Party shall take the appropriate steps to ensure:

- (i) comprehensive and systematic safety assessments are carried out before the construction and commissioning of a nuclear installation and throughout its life. Such assessment shall be well documented, subsequently updated in the light of operating experience and significant new safety information, and reviewed under the authority of the regulatory body;*
- (ii) verification by analysis, surveillance, testing and inspection is carried out to ensure that the physical state and the operation of a nuclear installation continue to be in accordance with its design, applicable national safety requirements, and operational limits and conditions.*

The obligations under Article 14 apply to nuclear installations. There are no nuclear installations in the terms of the Convention in the Kingdom of Denmark.

As of the activities concerning decommissioning of the former three research reactors under the responsibility of Danish Decommissioning the safety of the facilities is regularly supervised by inspections and assessments. The inspections and assessments are carried out by the regulatory authorities.

Article 15. Radiation Protection

Each Contracting Party shall take the appropriate steps to ensure that in all operational status the radiation exposure to the workers and the public caused by a nuclear installation shall be kept as low as reasonably achievable and that no individual shall be exposed to radiation doses which exceed prescribed national dose limits.

The obligations under Article 15 apply to nuclear installations. There are no nuclear installations in the terms of the Convention in the Kingdom of Denmark.

Matters of radiation protection are addressed primarily by the Act No. 94 of 31 March 1953 on Use of Radioactive Substances etc., which is under the auspices of the Ministry of Health and the Danish Health Authority, Radiation Protection. The dose limits are in accordance with the recommendations of the International Commission on Radiological protection (ICRP) and the Euratom Basic Safety Standards Directive.

As of matters of radiation protection in Greenland this is under the auspices of the Government of Greenland, Ministry of Health. It is addressed by Act No. 33 of 9 December 2015 on ionizing radiation and radiation protection. The regulation in Greenland is similar to legislation in Denmark.

Article 16. Emergency preparedness

1. ...
2. ...
3. *Contracting Parties which do not have a nuclear installation on their territory, insofar as they are likely to be affected in the event of a radiological emergency at a nuclear installation in the vicinity, shall take the appropriate steps for the preparation and testing of emergency plans for their territory that cover the activities to be carried out in the event of such an emergency.*

In this chapter an overview of the Danish Nuclear Emergency Preparedness and Response System is presented.

While there are no nuclear installations in the terms of the convention in the Kingdom of Denmark, several nuclear power plants are operating in other countries close to the borders of Denmark; eight operating power reactors are within a distance of approximately 250-300 km from the Danish borders.

The present nuclear power plants in the vicinity of Denmark are all of western design equipped with filtered containment, but in the context of emergency planning, the risk of a filter bypass from such installations cannot be disregarded. Terrorist activities may contribute to this risk.

Figure 2; Nuclear Power Plants near Denmark



The Government Order on Protective Measures against Accidents at Nuclear Installations, 1963, states that an emergency preparedness plan must be issued for all nuclear installations on Danish territory and for all Danish harbours, which receive nuclear powered ships. It also stipulates that in case of exposure from ionising radiation or other nuclear risks, preventive measures can be initiated, such as:

- Radiation monitoring etc, if necessary also on private property
- Notification of the public
- Area cordon off
- Evacuation/relocation and quartering
- Sheltering, including tight-fitting of windows and switching off ventilation
- Traffic regulations
- Restrictions on use of foodstuffs

In the aftermath of the Fukushima Daiichi accident Denmark has implemented improvements in the emergency preparedness system and equipment and human resources within the nuclear area.

The nuclear preparedness plan and the general preparedness regime have been revised in order to achieve a higher level of awareness and coordination among the various national authorities involved in emergency planning and emergency response (in the nuclear/radiological field).

The Consolidation Act No. 660 of 10 June 2009 on Emergency Management (with subsequent changes) states that the Danish Emergency Management Agency shall draw up a plan for the coordination and cooperation between the authorities responsible for the maintenance and continuation of society's functions in the event of a Nuclear Accident. The plan should be revised to the extent that the development makes it necessary and at least once every four years.

The revised nuclear emergency preparedness and response plan from 2014 for protection of the public in case of nuclear accidents or radiological emergencies sets out as an objective that the activities and coordination between authorities shall build on existing mechanisms. Sector based responsibility is fundamental for the Danish emergency preparedness regime, and wherever possible the Danish nuclear emergency system is based on organisations and preparedness arrangements that are already in force for other purposes; regardless of the kind or nature of an accident or a catastrophe, the organisation of and coordination between various authorities will take place in the same single organisational set-up. Thus decision-making and coordination between authorities will rely on familiar structures and procedures which will facilitate robustness and effectiveness.

Improvements have also been implemented to refine and strengthen the permanent monitoring system that monitors radiation levels 24/7 in Denmark and Greenland. The permanently monitoring system is a key element in the nuclear emergency preparedness system along with mobile measurement systems and the newly developed Nuclear Field Investigation Teams (NFIT).

Furthermore the Danish Emergency Management Agency has strengthened its cooperation with neighboring countries in the nuclear area.

In the following, the emergency management system and the emergency preparedness system will be elaborated.

Objective

The Danish nuclear emergency setup shall respond adequately to a wide range of situations. These may range from a major accident that can lead to radioactive substances being widely dispersed and posing an immediate danger to an event, which does not involve any radiation hazard, but which may, however, create uncertainty among the public. It was an important lesson learned from Fukushima, that nuclear accidents even very far from Denmark will require attention and measures by the emergency preparedness authorities as well as from other authorities with relevant high level expertise.

The main objectives of the emergency preparedness and response system are:

- to maintain daily preparedness surveillance
- to implement protective measures immediately, if and as necessary
- to provide information to the public and the relevant authorities
- to guide public behaviour in order to avoid or reduce adverse effects.

As there are no nuclear installations in Denmark the emergency situations as of the Convention will first and foremost originate from nuclear accidents or radiological emergencies abroad. These might for instance relate to the nuclear power plants located around Denmark. The aim of the emergency planning is however, rather than being oriented at a specific type of accident at a specific installation, to create a flexible organisation which must be capable of handling in various situations. Coordination measures and well known procedures are key elements in the emergency planning.

Denmark has through a number of years participated intensively in Nordic co-operation programmes on nuclear emergency preparedness especially in the fields of radioecology and field monitoring. In 1993 the heads of the Nordic nuclear safety authorities and the Nordic radiation protection authorities established a working group, "Nordic Working Group of Emergency Preparedness" (NEP), for co-operation, coordination, exchange of information and assistance in the field of emergency planning and response. The Nordic cooperation and network is considered a very important tool for the maintenance of competence in the Danish Emergency Management Agency/Nuclear Division as well as in other authorities.

Denmark also has close bilateral cooperation with German and Swedish authorities as well as the local authorities responsible for emergency preparedness at Ringhals and Brokdorf nuclear power plants – the nearest nuclear power plants to Denmark, among others – also in order to implement concepts from the HERCA/WENRA approach.

Organisation

The Minister of Defence is responsible for the Danish Nuclear Emergency Preparedness and Response. The operative organisation is based primarily on the Nuclear Division in the Danish Emergency Management Agency and also on a number of regional based national rescue centres.

The police and a number of governmental authorities participate in the performance of the nuclear emergency tasks alongside the Danish Emergency Management Agency. Among these the Danish Health Authority, Radiation Protection, the Danish Meteorological Institute, the Danish Veterinary and Food Administration and the Danish Agrifish Agency, should be mentioned. They all contribute within their fields of responsibility with professional information, assessments and advice, and they participate in the dissemination of information.

Operative and administrative activities of the entire emergency response system is coordinated within the "National Operative Staff" (NOST) which is the coordinating body at a central level – in principle regardless of the kind or nature of a large accident or catastrophe. National Operative Staff is led by the national police and a number of authorities are permanent members and will thus participate in emergency management on a regular basis. The Danish Emergency Management Agency however will in case of urgency be authorised to take certain necessary decisions on its own and to coordinate notification and implementation of protective measures and monitoring, so as to ensure that such steps are carried out in due time and in an appropriate way. Decisions on implementation of protective measures are based both on radiation monitoring and on calculated prognosis.

In case of a nuclear accident that will or can affect Denmark, the NOST will convene to coordinate activities to be carried out by various authorities and also to prepare information to the Government of Denmark including general information about the accident as well as specific information needed in connection with decision making. Also information to the public will be coordinated within the NOST though formally this is a sole responsibility for authorities concerned.

The Danish Emergency Management Agency, Nuclear Division, will be alerted by warnings issued internally. Consequently the Danish Emergency Management Agency, Nuclear Division, is first to decide on the activation of the emergency response system. Even if it is considered unlikely that the event could cause radioactive contamination in Denmark, it may be decided to activate the emergency response system or selected functions herein if they are needed in order to enhance and assess the available information and to inform other authorities and the general public. Such measures may include the rapid staffing of a number of call centres as well as ensuring that relevant information is available on the Internet. Information will be distributed in close cooperation with the national media.

Early Warning and Radiation Monitoring

Early warning in case of a nuclear accident is based on international agreements on exchange of information and on bilateral agreements, which Denmark has concluded with a number of neighbouring states (Sweden, Germany, Finland, UK, Poland, Russia, and Lithuania). There is very close co-operation among the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) facilitated by a high-level working group on emergency preparedness and a common manual on response activities and information exchange.

The Danish Emergency Management Agency manages an online system for automatic monitoring of radioactivity that covers Denmark and Greenland. The system is designed primarily to detect release from a Nuclear Power Plant beyond the vicinity of Denmark and Greenland and the system is in operation 24/7. The system provides monitoring data, including gamma spectra and information about selected isotopes from 11 online monitoring stations in Denmark and 3 in Greenland as well as 2 air-filtering stations. The data from the monitoring stations are collected automatically at the Danish Emergency Management Agency and at DTU Risø Campus. An automatic warning system will alert the on-duty officer of any increase in gamma radiation that might be attributed to causes other than natural variations. Radiation monitoring data from neighbouring states are also available online based on the EURDEP network operated by the EU.

The monitoring system includes two units for airborne monitoring of gamma-spectra from surface contamination and two vehicles equipped with similar gamma spectrum analysis equipment.

Furthermore mobile monitoring teams from the national rescue centres can be alerted in a few minutes. For more sophisticated measurements the Danish Emergency Management Agency can together with other authorities and experts provide a few expert monitoring teams if required.

DEMA uses the decision support system, ARGOS (Accident Reporting and Guiding Operational System) which is used for consequence assessment and decision support following a nuclear, radiological (or chemical) emergency. The system uses atmospheric dispersion models and calculates doses to the public, in the food chain and in the urban environment using real-time online weather data. ARGOS can also be used to present measurement data from car- and airborne and handheld measurement systems

Special Operational Resources

Over the last years (from 2014) the Danish Emergency Management Agency has developed Special Measuring Teams – Nuclear Field Investigation Teams (NFIT). NFIT's are able to map radiation with a particular focus on identifying "hotspots" while radiation levels in this context is decided by a specific assessment of the situation by designated experts. Moreover the NFIT's are a part of the Danish Emergency Managements HAZMAT concept, as all HAZMAT-specialists also must be NFIT-trained.

NFIT-teams consist of 2-4 persons, all of which are NFIT trained, dependent on the situation, and the NFIT-teams are available from all the operative emergency centres within the Danish Emergency Management Agency. The NFIT-program now (October 2016) includes 38 trained staff. The NFIT-resource was subscribed to IAEA RANET as of September 2016.

Training and Exercises

Participation part in training and various exercises is considered a fundamental part of maintaining and developing competences and is also an efficient way to train and refine bi- and multilateral agreements on e.g. assistance and notification.

During the last years the Danish Emergency Management Agency has held or taken part in a number of exercises and among these the following should be mentioned;

CONTEX 14 was a nuclear measurement exercise involving measurement teams and car borne equipment. The exercise was designed and planned in close cooperation with experts from Lund University, Sweden. Beside the measurement teams from the Danish Emergency Management Agency, measurement teams from Norway and Sweden took part in the exercise.

The purpose of the exercise was to test and strengthen the operational capacity and insertion ability of nuclear emergency measurement teams, including communication between the measurement teams and experts in staff, handling of large quantities of data and improving tactics by measuring after radioactive sources.

Contex 16 was again a nuclear measurement exercise. The purpose of CONTEX 16 was to train and further educate primarily the Danish Emergency Management Agency's Nuclear Field Investigation Teams (NFITs). However experts from Iceland, Sweden, Norway and Germany also participated in the exercise and observers from Norway, Germany, Great Britain and Romania were presented throughout the exercise.

The exercise covered several scenarios and personnel from a number of authorities participated. More specifically the scenarios were to map hotspots in an area with contamination from a wrecked Nuclear Power Plant combined with searching for materials out of regulatory control (MORC). The measurement results were transmitted to the DEMA staff for analysis, evaluation and recommendation through provision of end products for decision makers.

Experts from the Danish Emergency Management Agency are participating in several activities under the Nordic Cooperation Forum "NKS" (Nordic Nuclear Safety Research) which includes specific training and exercise, e.g. the following;

- MOMORC (Mobile search of Material outside of Regulatory Control (MORC)).

The aim of the project is to develop a model to determine the detection limits for car-borne search of "orphan" gamma and neutron sources and to verify the model by conducting systematic field experimental measurements with car-borne measurement equipment and analysis methods used in the Nordic countries.

- NISI (Nordic in situ gamma intercomparison).

The aim of the NISI-activity is to provide an opportunity for quality assurance, sharing of knowledge and to discuss harmonization of methods to facilitate the need to harmonize measurement procedures, applied models and dissemination of results between Nordic countries in order to accurately compare results and provide bilateral assistance. The NISI-activity includes a joint intercomparison field exercise and a seminar on in situ gamma spectrometric measurements in which results are presented.

- NORDUM (Intercomparison of Nordic Unmanned Aerial Monitoring Platforms)

The NORDUM-activity covers field testing of unmanned aerial platforms. Actual radiation sources are placed at an open site and then made available to the participants to make measurements. Different sources and configurations are used to fully test the teams and their platforms in terms of source location, identification and activity estimates. At a seminar at the end of the field activities the teams may present their results and discuss challenges and successes.

In November 2015 a large national exercise with a nuclear scenario was carried out. In the basic scenario a nuclear powered ship collided with a large cargo ship and the collision caused severe damage to the nuclear powered ship and to prevent the nuclear ship from sinking it was grounded. However the situation on board continuously deteriorated and the authorities involved were challenged in three phases; recognition phase, an escalation phase and a phase with the risk of radioactive discharges/releases. The challenges covered issues of emergency preparedness and civil protection, health, food, transport, energy, intelligence and security service, Foreign Service etc.

Denmark considers it of very high value to take part in small as well as large scale exercises, and as a non-nuclear country Denmark considers such activities of outmost importance. Participation in exercises is an opportunity to maintain the competences of the highly skilled professionals in general as well as to train specific competences. The various exercises are also an opportunity to exchange experiences and to take note of professional development in other countries and especially at authorities in the same field.

The Competent Authority

In terms of the Convention on Nuclear Safety, the Danish Emergency Management Agency, Nuclear Division, under the Ministry of Defence is the national competent authority. The Danish Emergency Management Agency, Nuclear Division, is also the national competent authority in terms of the Convention on Early Notification of a Nuclear Accident and in terms of the Convention on Assistance in Case of a Nuclear Accident or Radiological Emergency.

As mentioned the Danish Emergency Management Agency, Nuclear Division, and the Danish Health Authority, Radiation Protection jointly constitute the national nuclear safety authorities.

At earlier review meetings it has been concluded that Denmark meets the obligations of the Convention, but it has also been noted that a predicted lessening in nuclear competence and the capacity of support organizations is of concern and constitutes an important challenge.

Through awareness of this important challenge and through training and exercise as well as targeted participation in relevant international activities it has so far been possible to recruit qualified personnel and maintain a high professional level.

An important factor is the Nordic cooperation. The Nordic cooperation has been established and developed over a number of years and the strong cooperation is and will also in the coming years be a valuable contribution to maintaining and developing competences and human resources.

Beside the involvement in Nordic cooperation participation in various working groups and participation in courses within e.g. IAEA and OECD are important elements of the ongoing maintenance and development of competences and capacities. Such activities have lifted the general level of knowledge in the Nuclear Division.

Article 17. Siting

Not applicable.

Article 18. Design and construction

Not applicable

Article 19. Operation

Not applicable

Conclusion

In conclusion – based on the above reporting under the applicable articles for a party having no nuclear installation on their territory – Denmark is in compliance with its obligations according to the Convention on Nuclear Safety.

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