Strålevern Rapport 2003:15

Norwegian National Report

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Statens strålevern

Norwegian Radiation Protection Authority
Postboks 55
N-1332 Østerås
Norway

Reference:
Sørlie, A.A. The first Norwegian National Report. The Joint Convention on the safety of Spent Fuel Management and the Safety on Radioactive Waste Management. StrålevernRapport 2003:15. Østerås: Norwegian Radiation Protection Authority, 2003.

Key words:
Convention, IAEA, spent fuel and radioactive waste management, safety,

Abstract:
The report gives a brief description of the "Joint Convention" and of the nuclear activities in Norway. Norway's National report and the text of the Convention are included in the report.

Referanse:
Sørlie A.A. Norges første nasjonale rapport. Felleskonvensjonen om sikkerhet ved håndtering av brukt brensel og sikkerhet ved håndtering av radioaktivt avfall. StrålevernRapport 2003:15. Østerås: Statens strålevern, 2003. Språk: engelsk.

Emneord:
Konvensjon, IAEA, håndtering av brukt brensel og radioaktivt avfall, sikkerhet

Resymé:
Rapporten gir en kort beskrivelse av konvensjonen og den nukleære virksomhet i Norge. Den norske rapporten og teksten til konvensjonen er i sin helhet tatt med.

Head of project: Anita A. Sørlie.

Approved:

Gunnar Saxebøl, director, Department for Radiation Protection and Nuclear Safety

75 pages.
Published 2003-12-20.
Printed number 200 (03-12).
Cover design: Lobo Media AS, Oslo.
Printed by Lobo Media AS, Oslo.

Orders to:
Norwegian Radiation Protection Authority, P.O. Box 55, N-1332 Østerås, Norway.
Telephone +47 67 16 25 00, fax + 47 67 14 74 07.
www.nrpa.no
ISSN 0804-4910

StrålevernRapport 2003:15

Norwegian National Report

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

Anita A. Sørlie

Statens strålevern

Norwegian Radiation
Protection Authority
Østerås, 2003

Content

1 Background

At the International Atomic Energy Agency (IAEA) General Conference in September 1994 the Convention on Nuclear safety (CNS) was opened for signature [1].

The objectives of the CNS are:

- to achieve and maintain a high level of nuclear safety worldwide through the enhancement of national measures and international co-operation including, where appropriate, safety related technical cooperation;

- to establish and maintain effective defences in nuclear installations against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionising radiation from such installations;

- to prevent accidents with radiological consequences and to mitigate such consequences should they occur.

The scope of the convention shall apply to the safety of nuclear installations.

Management of radioactive waste is not covered within the scope of the CNS. In February 1995 the General Director of the IAEA invited member states to an open meeting to discuss the need for one more convention. It was agreed that it was a need for a "waste convention" and the process for the elaboration of this started.

The existence of the Convention on Nuclear safety as a basis and the experiences from the discussions during the establishment was an advantage during the meetings and discussions for the "waste convention". Yet, 7 meetings were needed before the text was approved at the diplomatic conference in September 1997.

2 Introduction

2.1 Nuclear activities in Norway

There are no nuclear power plants in Norway. The institute for Energy Technology (IFE) owns and operates two research reactors.

2.1.1 IFE Kjeller

Research Reactor Facility.
At IFE Kjeller one research reactor, JEEP II, has been in operation since 1967. Max thermal output is 2 MW and heavy water is used as coolant and moderator. The fuel used in the reactor consists of slightly enriched uranium dioxid.
JEEP II is used to produce pharmaceutical products and irradiation services for medicine, industry and research. Neutron beams from the reactor are used to study the basic physical characteristics of solids and liquids.

Radioactive Waste Facility.
A facility for receiving, sorting, handling, treatment and conditioning of radioactive waste. It is the only facility of this type in Norway. It receives all Low and Intermediate Level Waste (LILW) generated in industry, hospitals, universities and research organisations. IFE does not receive LLW containing only naturally radioactive nuclides (TE-NORM).

Storage Buildings.
One building, 434 m^2 in size, is used for the storage of conditioned waste packages. In the second building, with a total area of 430 m^2, in addition to the storage of conditioned waste packages, it also contains an incinerator oven for combustible low level waste. A separate part of the building contains the storage for non-irradiated uranium.

At Kjeller, spent fuel from the JEEP II reactor is stored in a dry storage facility consisting of a concrete block with several storage tubes covered with shielding plugs. The concrete block is located beneath a building designated for loading and unloading of transports of nuclear material. From the time of the removal of the fuel from the reactor until it is placed

into dry storage, the fuel is cooled in water pools in the reactor hall.

Spent fuel elements from the former JEEP I and NORA reactors are stored at Kjeller in a similar storage facility located beneath another building at the site. The storage tubes in this storage location are mainly surrounded by sand instead of concrete; concrete is used only in the bottom and on top of the storage compartment.

2.1.2 IFE Halden

Research Reactor Facility.
At IFE Halden one research reactor is installed and in licensed condition, the Halden Boiling Heavy Water Reactor (HBWR). The operation started in 1959. The reactor has a maximal thermal output of 20 MW and the coolant as well as the moderator is heavy water. The fuels in the reactor are enriched uranium dioxide and for the test fuel both uranium dioxide and MOX fuel is used.
The main research activities at the Halden reactor are related to reactor-safety, technological research and development. Fuel testing and research on man-machine interactions are two important issues.

The waste generated mainly consists of ion exchange resins. Tested fuel elements are returned to the owners.

At the Halden site, the spent fuel is stored in a bunker building outside the reactor hall. Metallic natural uranium fuel is stored in a dry storage compartment in the bunker. The rest, the oxide fuel, is stored in a pool under the floor. Between removal from the reactor and dry storage, the fuel is cooled in water pools in the reactor hall.

Further information can be found on ***www.ife.no.***

2.1.3 KLDRA Himdalen

The Combined disposal and storage facility for Low and Intermediate Level Waste (LILW) in Norway, located in Himdalen, in Aurskog Høland municipality [2]. The facility was licensed in 1998 and has been in operation since March 1999. The main purpose of the facility is direct disposal of conditioned waste packages. A fourth of the capacity at the facility is for storage purposes. Waste packages being placed there are all in a "disposal ready form" and will either be encased in concrete, as done in the repository part of the facility, or retrieved for disposal at another site. IFE is responsible for the operation.

The facility is a "rock cavern" facility with 4 caverns accessed by a 150 m long tunnel excavated from the crystalline rock. One of the caverns is used for storage. In each cavern are two sarcophaguses, each with two sections. The waste packages will be stacked in four layers. After emplacing the drums in a layer it will be encased in concrete to provide a new floor for the subsequent layer. When each sarcophagus is filled there will be a concrete roof on top with a water tight sealing.

2.2 Regulatory body in Norway

The regulatory body for nuclear safety, radiation and radiation protection in Norway is the Norwegian Radiation Protection Authority (NRPA). It is organised as a directorate under the Ministry for Health. NRPA regulates issues concerning nuclear safety, nuclear emergency preparedness and radiation protection, and is organised in three departments:

- Department for Radiation Protection and Nuclear Safety;
- Department for Emergency Preparedness and Environmental Radioactivity;
- Department for Planning and Administration.

The departments are further divided into specialised sections. The NRPA has a total staff of about 90 persons and a basic annual budget of around 50 million NOK. In addition to this, the NRPA is funded from other governmental sources for miscellaneous projects.

Further information can be found on ***www.nrpa.no.***

2.3 Establishment of the JOINT Convention

The negotiations at the IAEA started in February 1995 at an open ended meeting for the establishment of a "waste convention". Member states were represented by officials from Ministries, authorities and technical and legal experts.

In some member states spent nuclear fuel is not considered as waste, and was considered to fall outside the scope of the convention. Other difficult topics were reprocessing and waste that originated from military or defence use. Waste containing only natural radioactivity spent sealed sources and transboundary movements also required detailed discussions.

The text of Convention was adopted at the Diplomatic Conference held at IAEA 1-5 September 1997 [3].

2.3.1 Scope of the Joint convention

- The convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel haled at reprocessing facilities as part of a reprocessing activity is not covered in the scope of the convention unless the Contracting Party declares reprocessing to be a part of spent fuel management.
- The Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, the Convention shall not apply to waste that contains only naturally occurring radioactive materials and that not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of the Convention by the Contracting Party.
- The Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purpose of the convention by the Contracting Party. However, the Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.
- The Convention shall also apply to discharges as provided for in Articles 4,7,11,14,24 and 26.

2.3.2 Enter into force

The convention entered into force on the ninetieth day after the date of the deposit with the Depositary (IAEA) of the twenty-fifth instrument of ratification, acceptance or approval, including the instruments of fifteen States each having an operational nuclear power plant.

The convention entered info force 18 June 2001.

Norway signed the convention 29 September 1997, the same day as it was opened for signature and ratified the convention 12 January 1998 [4].

By October 2003 the convention has been signed by 42 member states and ratified, accepted or approved by 33 member states.

2.3.3 Obligations of the contracting Parties

The obligations of the contracting Parties with respect to the safety of spent fuel and radioactive waste management are based on the principles contained in the IAEA Safety Fundamentals "The principle of Radioactive Waste Management" [5]. They include the obligation to establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management and the obligations to ensure that individuals, society and the environment are adequately protected against radiological and other hazards,

inter alia, by appropriate siting, design and construction of facilities both during their operation and after closure.

The Convention imposes obligations on Contracting Parties in relation to the transboundary movement of spent fuel and radioactive waste based on the concepts contained in the IAEA Code of practice on the International Transboundary Movement of Radioactive Waste. Contracting Parties have the obligation to take appropriate steps to ensure that disused sealed sources are managed safely.

2.4 Reporting and procedures

At the *Preparatory meeting of Contracting parties,* 10-12 December 2001, the following was adopted;

Rules of Procedures and financial rules, Guidelines Regarding the Review Process and Guidelines Regarding the form and Structure of National Reports. It was also agreed that detailed discussions of National Reports will be conducted in Country Groups at the review meeting. [6,7,8,9].

At the *Organisational meting for the first review meeting,* 7-9 April 2003, Country Groups were established. President and officials for the review meeting was elected and selected. Each Country group has a; coordinator, rapporteur, vice-and chairman [10].

The grouping is done using a "seeding list" according to the number of nuclear power plant reactors in the respective countries. This is done to have a mixture of countries with large scale and small scale or no power reactor programme in each group.

All contracting parties shall prepare and submit to IAEA a national report according to "The form and structure of national reports" [9]. In the report they shall describe how the obligations in the convention are fulfilled.

Group 1	Group 2	Group 3	Group 4	Group 5
USA	France	UK	Germany	Canada
Belgium	Spain	Sweden	Ukraine	Korea
Slovakia	Bulgaria	Czech Rep.	Switzerland	Finland
Slovenia	Romania	Netherlands	Argentina	Hungary
Latvia	Luxemburg	Morocco	Norway	Poland
Greece	Denmark	Croatia	Belarus	Austria
Ireland	Australia[1]	Japan[2]		

[1] Australia is a late ratifier

[2] Japan ratified late and was allowed to participate in this group at the review meeting, since it was consensus by the contracting parties, decided at the beginning of the review meeting.

Facilities for spent fuel and radioactive waste management as well as the inventories are also reported.

The information is confidential. Each contracting party may decide to make their report available to the public. Most of the reports are now available on internet. The Norwegian report can be found on www.nrpa.no, other reports can be found on

www.iaea.org

www-rasanet.iaea.org/conventions/waste-jointconvention.htm

The reports are then sent to the national contact point in the respective member states (NRPA in Norway). Contracting parties can then read, comment and ask questions to the reports from the other parties.

Norway received 94 questions/comments from 11 contracting parties. These questions/ comments and the answers can be found in this report in chapter 4.

2.4.1 Review meeting

The first review meeting took place at IAEA in Vienna 3-14 November 2003. At this meeting the contracting parties presented their reports and answered any questions they received. Trends and general questions were also discussed. The outcome of the meeting has been summarized in a report. This report is available to the public [11].

3 First National report

Here is the first Norwegian National report as sent to IAEA 2 May 2003, except that photos are not included here.

For further information please contact nrpa@nrpa.no the report is also available on www.nrpa.no.

Joint Convention on

the Safety of Spent Fuel Management

and on

the Safety of Radioactive Waste Management

National Report from Norway

First Review Meeting, 3-14 November 2003

Section A. Introduction

Norway signed the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management on 29 September 1997, the day it was opened for signature. It was ratified and deposited on 12 January 1998.

This report is the Norwegian report to the first review meeting to the Convention to be held at IAEA in Vienna from 3-14 November 2003. The report is written in accordance with the guidelines concerning the form and structure of national reports, as established by the Contracting Parties under Article 29 of the Convention at the Preparatory Meeting held at IAEA on 10-12 December 2001.

The report was prepared by the Norwegian Radiation Protection Authority (NRPA) based on information previously received from the Institute for Energy Technology (IFE). It is concluded in this report that Norway meets the obligations of the Joint Convention.

Section B. Policies and Practices

Article 32. Reporting (1)

The Norwegian nuclear program was initiated in 1948 by the establishment of the Institute for Atomic Energy (known from 1979 as the Institute for Energy Technology). The original goal of the new institute was to embark on a nuclear power program; however, after years of development of domestic technologies and thorough assessment of foreign technologies, the Norwegian Parliament ultimately decided in 1986 not to utilise nuclear energy for the foreseeable future. The research reactor program then became the nuclear activity in Norway. From 1967 and onwards, the core of this program consisted of the JEEP II reactor at Kjeller (2 MW) and the Halden Boiling Water Reactor (HBWR) in Halden (25 MW). The HBWR, which was built in 1959, is the reactor utilised by the OECD Halden Reactor Project.

Norwegian management of spent nuclear fuel has gone through different phases. In the 1960s, reprocessing was an emerging technology. Spent fuel from the first research reactor in Norway, JEEP I (in operation from 1951-1967) was partly used as feed material for a trial (prototype?) reprocessing plant at the Kjeller site. This plant was in operation from 1961 to 1968 and is now fully decommissioned. The rest of the spent fuel from the JEEP I reactor, along with spent fuel from the NORA reactor (in operation 1961-1968), and finally spent fuel from the JEEP II reactor, still in operation, is stored at Kjeller.

The first core loading in HBWR was stored after irradiation. However, since reprocessing was still considered a viable option also for the forthcoming Norwegian fuel cycle, the second core loading was reprocessed in Belgium in 1969. However, when the third core loading was discharged, reprocessing was no longer a politically acceptable option. Consequently, spent fuel from the HBWR is now stored on site. Nevertheless, reprocessing is not considered as a relevant option for spent fuel in Norway. The existing spent fuel will, as far as possible considering its suitability for later direct disposal, be stored until final disposal is possible.

Low and intermediate level waste (LILW) has been conditioned and stored at Kjeller since the start of the IFE facilites in 1948. LILW from HBWR was routinely transported to Kjeller for conditioning and storage. In 1970, around 1 000 drums of LILW were disposed. The drums were buried in a 4 meter deep trench covered with clay) on the IFE site at Kjeller.

However, several years of discussions over final disposal options for LILW in Norway as well as a shortage of storage capacity in the dedicated buildings at IFE, resulted in the establishment of the Combined Disposal and Storage Facility for LILW in Himdalen, approximately 26 kilometers south-east of the Kjeller site. The facility in Himdalen was taken into service in 1999. The buried waste mentioned above has now been excavated and reconditioned and is currently being disposed of or stored together with the rest of the waste in the new facility. Thus, the LILW stored at IFE in the dedicated buildings is being moved to Himdalen. The present policy is to dispose the LILW (TE-NORM excluded) in the Himdalen facility. This facility is estimated to have sufficient capacity to accommodate disposal needs until 2030. At that time a decision will be made whether or not to convert the storage part into a repository or not.

Section C. Scope of Application

Article 3. Scope of application

As a Contracting Party to the Joint Convention Norway has:

(1). Not declared reprocessing as part of Norwegian management of spent fuel.;

(2). Not declared waste that contains only naturally occurring radioactive materials as waste for the purpose of this convention;

(3). Not declared spent fuel or radioactive waste generated within military or defence programmes as spent fuel or radioactive waste for the purpose of this convention.

Section D. Inventories and Lists.

Article 32 Reporting (2)

(i) Management facilities for spent nuclear fuel

- At the Halden site, the spent fuel is stored in a bunker building outside the reactor hall. Metallic natural uranium fuel is stored in a dry storage compartment in the bunker. The rest, which is oxide fuel, is stored in a pool under the floor. Between removal from the reactor and dry storage, the fuel is cooled in water pools in the reactor hall.

- At Kjeller, spent fuel from the JEEP II reactor is stored in a dry storage facility consisting of a concrete block with several storage tubes covered with shielding plugs. The concrete block is located beneath a building designated for loading and unloading of transports of radioactive material. From the time that the fuel is removed from the reactor until it is placed into dry storage, the fuel is cooled in water pools in the reactor hall.
- Spent fuel from the former JEEP I and NORA reactors is stored at Kjeller in a similar storage facility located beneath another building at the site. The storage tubes in this storage location are mainly surrounded by sand instead of concrete; concrete is used only in the bottom and on top of the storage compartment.
- Remaining solutions of uranium containing some plutonium and fission products from the decommissioned reprocessing test facility are stored in stainless steel tanks in the basement of the radwaste treatment plant.

(ii) Spent fuel inventory

Inventory of irradiated nuclear material in Norway as of 1 January 2003 (all numbers in kg).

	MBA-A	MBA-B	MBA-C	Total IFE-Kjeller	Total IFE-Halden	Grand Total
Enriched uranium	337	1486	3100	1823	3100	4923
Natural uranium	0	1103	75	1103	75	1178
Metallic uranium	3125	0	6918	3125	6918	10043
Depleted uranium	0	2	17	2	17	20
Thorium	2	98	12	100	12	112
Total				**6153**	**10123**	**16276**

(iii) Radioactive waste management facilities

At the IFE's site at Kjeller the following facilities are in operation:

- Radioactive Waste Facility (built in 1959).
  This is a facility for receiving, sorting, handling, treatment and conditioning of radioactive waste, and is the facility of this type in Norway. It receives all LILW generated by Norwegian industry, hospitals, universities, research organisations and military forces. LLW containing only naturally radioactive nuclides (TE-NORM) is not received at IFE.
- Storage Building 1 (built 1965-66)
  This building is 434 m^2 in size and is used for the storage of conditioned waste packages.
- Storage Building 2 (built 1977-78)

In this building, there is an area (430 m^2) devoted to the storage of conditioned waste packages. It also contains an incinerator oven for combustible LLW. A separate part of the building contains the storage for non-irradiated uranium.

- KLDRA Himdalen (built 1997-98)
  This is the Combined Storage and disposal facility for LILW in Himdalen, in Aurskog Høland municipality. It has been in operation since March 1999. The main purpose of the facility is direct disposal of conditioned waste packages. A fourth of the capacity of the facility is today for storage of. Waste packages being placed there are all in a "disposal ready form" and will either be encased in concrete, as is done in the repository part of the facility, or retrieved for disposal at another site.

(iv) Inventory

Norwegian legislation does not specify any criteria for the classification of radioactive waste. However, the classification in IAEA Safety Series No 111-G.1.1 "Classification of Radioactive Waste" is applied as far as is reasonably practicable. Given the long history of radwaste management in Norway, the IAEA criteria cannot be followed exactly for most of the historical waste, mainly due to higher contents of long-lived alpha emitting nuclides than the IAEA criteria specify. This, however, has been taken duly into account when assessing the safety of the repository both in the short and long time range.

Historically these categories were used in Norway: Spent nuclear fuel, ion exchange resins, "Some sources" and the other wastes. The waste was segregated according to half life:

Category I: ≤ 1 year

Category II: > 1 ≤ 30 years

Category III: > 30 years

Waste packages were sorted according to dose rate levels on the waste drum.

For a contact dose rate of >10 mSv/hour, lead shielding is used inside the drum.

At this time, a transitional period is taking place. Archives are being converted into electronic databases, a more formal classification system is being put into place, and there are ongoing efforts to achieve a more detailed overview of legacy waste as well as better predictions of upcoming waste.

For this report this inventory of Norwegian radioactive waste is specified below (MBq):

MBq	Himdalen Repository	Himdalen Storage	IFE LILW-SL	IFE LILW-LL
Gross alfa*	3695			
Am-241	291595			
Ba-133	13			
Gross beta*	405660			
C-14	31961			
Cm-244	396			
Co-60	14631453	3818		
Cs-137	45500065	180656		
Eu-152	479			
H-3	126476347			
Kr-85	58816			
MFP*	131479			
Ni-63	1295			
Pu-239	1642			
Ra-226	4058			167992
Sr-90	1158863			
U,Pu,FP*	2279183			
U-238	998	156		
Am/Be				4000000
Pu (mg)	3702 mg	32904 mg		2660 mg
Total no. of 220 l drums	3004	157	850	20

* = Historical categories

MFP = Mixed Fission Products

(v) No nuclear facilities are in the process of being decommissioned in Norway.

Section E. Legislative and Regulatory Systems.

Article 18. Implementing measures

Article 19. Legislative and regulatory framework

All nuclear activities, including transboundary movements, are regulated by the Act 12 May 1972 No. 28 on Nuclear Energy Activities with provisions by the Act (detailed regulations), and Act 12 May 2000 No. 36 on Radiation Protection and Use of Radiation with provisions by the Act (detailed regulations).

According to the Act 14 June 1985 No. 77 on Planning and Building Activities with its specific regulation on impact assessments of 21 May 1999, nuclear power plants and other nuclear reactors, plants for handling of irradiated nuclear fuel, plants for production or enrichment of nuclear fuel, and installations for disposal of radioactive waste should always be object of an impact assessment. When planning for an installation for collection, handling and storing of radioactive waste one should consider carrying out an impact assessment. A decision on whether an impact assessment should be carried out, is taken by the competent authority.

Act of 12 May 1972 No. 28 on Nuclear Energy Activities

This act establishes the requirements for the licensing and regulation of nuclear activities. Licences for operation of nuclear facilities are granted by the Government on the basis of applications and the recommendations of the regulatory body. The Norwegian Radiation Protection Authority is the official designated regulatory body; however, NRPA is not vested with the authority to issue regulations. Licences are normally issued for a period of ten years. Certain specific regulations are issued pursuant to the act, mainly regulations on physical protection and safeguards.

Act of 12 May 2000 No. 36 on Radiation Protection and the Use of Radiation

This act supersedes the Act of 18 June 1938 on the Use of X-rays and Radium and so forth. The newer act regulates all handling of radioactive substances and the radiation protection aspects thereof. Neither the act nor the regulations are very specific when regulating waste issues and all details will have to be regulated by the NRPA through guidelines and requirements associated with licences and approvals, with these being handled on a case by case basis.

Article 20. Regulatory body

The official regulatory body is the Norwegian Radiation Protection Authority (NRPA). It is organised as a directorate under the Ministry for Health. NRPA is regulating issues concerning nuclear safety, nuclear emergency preparedness and radiation protection, and is organised in three departments:

- Department for Radiation Protection and Nuclear Safety;
- Department for Emergency Preparedness and Environmental Radioactivity;
- Department for Planning and Administration.

The departments are further divided into specialised sections. The NRPA has a total staff of about 90 persons and a basic annual budget of around 50 million NOK. In addition to this, the NRPA is funded from other governmental sources for miscellaneous projects.

NRPA is handling nuclear safety issues and radiation protection of the nuclear facilities, as well as in other industry and research. One of NRPA responsibilities is the handling of applications for licences and the renewal of licences for the operation of nuclear facilities. In a typical application process, for example, the applicant sends the safety reports to NRPA for review. The NRPA then sends a report with its recommendations to the Ministry of Health for further handling. Once approved, the ensuing licence is granted by the Government. NRPA also carries out regular inspections to ensure that the requirements of a licence are fulfilled and complied with. NRPA is also responsible for the processing and approval of radiation discharge licences for all nuclear facilities in Norway

The NRPA acts as the secretariat for the emergency preparedness organisation against nuclear accidents, see article 25. Monitors radioactive pollution of the environment and food, and natural incidence of radioactive substances, particularly radon gas in homes.

NRPA conducts an extensive international cooperation, including collaboration with Russian authorities and nuclear safety and environmental projects under the Nuclear Action Plan besides arctic environmental cooperation under the Arctic Council. The NRPA also performs extensive research in preparedness, the transport and absorption of radioactive substances in plants, animals and people, and environmental and public health impact assessments.

NRPA has an Emergency Preparedness Unit at Svanhovd in Sør-Varanger near the Russian border, and an Environmental unit at the Polar Environment Centre in Tromsø.

Section F. Other General Safety Provisions.

Article 21. Responsibility of the licence holder

The Institute for Energy Technology (IFE) is the licence holder for Norway's two research reactors and the combined disposal and storage facility in Himdalen. It is IFE's responsibility to maintain facility safety as high as possible and in accordance with the licence requirements and appropriate international standards. As all licences are reviewed every ten years, this means a more or less continuous revision of the safety documents. IFE is also required to send updated safety reports every third year to NRPA. The current licence for IFEs nuclear facilities expires 31 December 2009 and the operation licence for the Himdalen facility expires in 2008. The Norwegian Radiation Authority also issues discharge permits to the Institute for Energy Technology. According to these permits the institute, among other things, has to use best available technology to reduce the discharges to levels as low as reasonably achievable.

The licencee is also responsible of for providing the necessary financial and human resources for maintaining safety and radiation protection at an appropriate level.

Article 22. Human and financial resources

Article 23. Quality assurance

The Institute for Energy Technology provides the financial resources and staff to operate Norwegian nuclear facilities (reactors, storage facilities, radioactive waste treatment plant) and the combined disposal and storage facility. It also organises the necessary training and retraining of personnel. The role of the Norwegian Radiation Protection Authority is to ensure that the resources and training/retraining provided are appropriate. The Atomic Energy Act authorises NRPA to impose sanctions on IFE in the event that safety standard are not maintained at an acceptable level.

The Institute for Energy Technology has established a system for quality assurance to cover the research reactors and the waste facilities, and provides for all aspects of operating a nuclear facility. This QA system is supervised by the regulatory body (NRPA).The licencee must also fulfil Norwegian quality assurance systems for health, occupational environment and safety as specified in other regulations.

Article 24. Operational radiation protection

According to the 2000 Act on Radiation Protection and Use of Radiation with regulations, the operator shall report radiation doses sustained by each worker annually to NRPA. These doses must be kept below ICRP limits (the 1990 Recommendations of the International Commission of radiological Protection) for each worker. Doses should be registered by the facility operator. In general, annual radiation doses should fall below 20 mSv/year, but IFE has obtained permission from NRPA on behalf of certain workers employed in special working operations to exceed this limit as long as the 100 mSv/ 5 years limit is maintained. Such exceptions must be justified and expressly applied for.

IFE has developed a system of work planning to keep the doses to the staff as low as is reasonably achievable, especially during maintenance work. This has led to improvements in general radiation protection at the facility as well as lower doses to the staff.

The operational limits and conditions for IFE's nuclear facilities are specified in licences and discharge permits in order to ensure that discharges are limited. Furthermore, specific measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment. The existing discharge approval of 19 December 2002 specifies that with respect to the risk of radiation exposure to population groups as a consequence of discharges, the maximum permitted doses to the population group most possibly exposed must fall below 1 µSv/year for liquid discharges and below 100 µSv/year in the case of discharges to the air in which the dose contribution from iodine isotopes shall be below 10 µSv/year. This condition applies both for the site at Kjeller and that in Halden. A separate set of criteria has been established for the facility in Himdalen.

In addition to the discharge limits, the permits give warning levels for specified nuclides. When the discharge of the nuclides exceeds the warning level, the institute should contact the Norwegian Radiation Protection Authority. When warning levels are exceeded the institute shall re-evaluate their routines and if possible reduce discharges. The re-evaluate shall focus on internal control and general use of best available technology.

The Institute for Energy Technology sends annual reports of environmental and discharge information to the regulatory body (NRPA).. IFE is also required to make information concerning discharges available to the public four times per year.

The requirements of Article 24 are fulfilled within the Norwegian regulatory system and the requirements and criteria set by NRPA, both for normal situations as well as the handling of a situation in which an unplanned or uncontrolled release of radioactive material occurs.

Article 25. Emergency preparedness

The Institute for Energy Technology has established emergency response plans for emergency situations specific to each of its sites as well as one for the Himdalen facility and for transports. The off site response is planned by the local police department in coordination with the Crisis Committee described below.

According to a Royal Decree of 26 June 1998, Norwegian emergency preparedness measures are coordinated by the Crisis Committee for Nuclear Accidents consisting of:

- Norwegian Radiation Protection Authority;
- National Police Directorate;
- HQ Defence Command Norway;
- Directorate of Civil Defence and Emergency Planning;
- Norwegian Board of Health;
- Norwegian Food Control Authority.

In addition, several other institutions act as advisors, amongst which the Institute for Energy Technology and the Norwegian Institute for Meteorology are the most important.

The NRPA has the chair of the Crisis Committee, and constitutes the secretariat. The Crisis Committee is authorised to gather information, make assessments, implement or recommend countermeasures and give information to the public. The Crisis Committee for Nuclear Accidents operates with two levels of emergencies. These apply both for domestic and foreign accidents. No countermeasures are automatically implemented purely on the basis of a declaration of a given level of emergency. Countermeasures will be implemented on an ad hoc basis depending on the assessments of the situation.

NRPA is the national contact point to the conventions on Early Notification and Assistance.

Norway has established bilateral agreements on early notification with Finland, Germany, Lithuania, the Netherlands, Poland, Russia, Sweden, Ukraine and the United Kingdom. The texts in the different agreements vary somewhat, but are all based on the 1986 IAEA Convention of Early Notification. NRPA is confident that these agreements will ensure a first notification in the event that an accident at a facility covered by the agreements should occur in the vicinity of Norway.

Article 26. Decommissioning

As part of the licensing requirements, the Institute for Energy Technology has to provide a plan for the decommissioning of its facilities, including the storage facilities for spent nuclear fuel. These decommissioning plans follow the recommendations of the IAEA Safety Standards Series No. WS-G-2.1 at the level of "ongoing planning". The decommissioning of spent fuel storage facilities constitutes a part of the later phases of the decommissioning process, and this is reflected in the current plans.

Section G. Safety of Spent Fuel Management

Article 4. General safety requirements

Norwegian general safety requirements for the safety of spent fuel management follow the IAEA recommendations in the field. The operator of the research reactor program, the Institute for Energy Technology, is responsible for the management of spent fuel from the two reactors. In the safety analysis reports for IFE's management program, the principles and requirements are stated. These safety analysis reports constitute an integral part of IFE's licence as granted by the Norwegian government; hence the requirements set in the safety analysis reports are mandatory. The principles stated in subsections (i) to (vii) are all adequately addressed in the safety analysis reports.

Article 5. Existing facilities

The Institute for Energy Technology has more than 50 years of experience in handling and storing spent nuclear fuel. So far, there have been no incidents at Norwegian facilities with respect to these activities. Spent fuel from the reactors is stored at the reactor sites. At the Halden Boiling Water Reactor, spent fuel is stored in a bunker building outside the reactor hall. The 42 year old metallic natural uranium fuel is stored inside the bunker within a dry storage compartment; the rest, which is oxide fuel, is stored in a pool underneath the floor. The water is continuously monitored and kept free from contamination.

At Kjeller, the spent fuel from the JEEP II reactor is stored in dry storage consisting of a concrete block with several storage tubes covered by shielding plugs. The fuel stored here has a cooling period of at least 90 days and does not require further cooling beyond that which is provided by the natural air circulation in the storage tubes. The concrete block is placed under a building specially designated for loading and unloading transports of radioactive material. Between removal from the reactor and dry storage, the fuel is cooled in water pools in the reactor hall.

Spent fuel from the former JEEP I (1951-1967) and NORA (1961-1968) reactors is stored in a similar storage facility under another building at the site. The storage tubes in this facility are mainly surrounded by sand as opposed to concrete; concrete is used only in the bottom and on top of the storage. There is no activity at present in this storage.

Remaining solutions of uranium containing plutonium and fission products from the now decommissioned reprocessing test facility are stored in stainless steel tanks in the basement of the radioactive waste treatment plant at the Kjeller site.

Article 6. Siting of proposed facilities

Article 7. Design and construction of facilities

No new nuclear facilities have been proposed for Norway at this time. The siting of a hypothetical facility for the storage or disposal of spent fuel in the future will be the result of a well defined process following domestic legislation and recommendations made by the IAEA and other international agencies. In that event, all steps as prescribed in Articles 6 and 7 would then be followed and other Contracting Parties to the Convention within the vicinity would be consulted.

Article 8. Assessment of safety of facilities

Article 9. Operation of facilities

The safety of facilities is assessed under the recommendations given by the IAEA in this field. Safety analysis reports are updated on a regular basis, and reported to the regulatory body every three years. According to the existing licence, an impact assessment for the nuclear facilities of the Institute for Energy Technology shall be conducted according to the Planning and Building Act before the end of 2004. The Norwegian Radiation Protection Authority is appointed the competent authority for this process. The notification including a proposal for a study program has been subjected to a public inquiry. The Norwegian Radiation Protection Authority has submitted the proposed study program to the Ministry of the Environment.

For any new spent fuel management facilities, a systematic safety assessment and an environmental impact assessment would be required.

At present, operation of the spent fuel facilities is considered part of the operation of the reactor plants, and is regulated through the licence for operation for the IFE nuclear facilities. The licence is based on the safety assessments. NRPA performs inspections to ensure that operation, monitoring and maintenance are in accordance with the procedures.

The dose limit to the public for the operation of such facilities is at present a part of the total limit for any discharge from the reactor sites. These dose limits set goals for the allowable doses from the operation of the facilities and the fulfilment of these goals is documented in the safety analysis reports. If and when another facility is taken into operation, the operation procedures will become a part of the licence for that facility. Any significant incidents will be reported to Norwegian Radiation Protection Authority in a timely manner and decommissioning plans will be developed during the licence period.

The obligations stated within Articles 8 and 9 are fulfilled within the Norwegian legal framework and the requirements of NRPA.

Article 10. Disposal of spent fuel

A portion of Norway's spent nuclear fuel was reprocessed in 1969 in Belgium. This fuel originated from the Halden Boiling Water Reactor. Reprocessing is at present not considered as a pertinent option for the management of spent fuel from Norway.

An officially appointed commission has made recommendations for the further strategy with regards to the management of spent fuel (NOU 2001:30). This commission pointed to the establishment of a central storage facility for spent fuel aimed at storage for a time frame of about 40 to 60 years,

whereupon it would be transferred to a final repository which would be operationally ready at the end of this period. The commission also recommended enhanced research in the field of rock disposal of spent fuel to prepare a good basis for construction of a final repository. The commission suggested that the operation of such a facility should be transferred to a new waste management organization which could simultaneously coordinate the research and public information activities. No suggestion was made as to where the site of a new storage facility and/or disposal facility should be located. At this time, no decision has been made concerning the follow up of the commission's recommendations, and the matter is currently being handled by the Ministry of Trade and Industry.

In conclusion for section G, it is found that the Norwegian regulatory system complies with all the terms under Articles, 4, 5, 6, 7, 8, 9.

Section H. Safety of Radioactive Waste Management

Article 11. General safety requirements

The obligations as specified in the convention are all fulfilled within the Norwegian legislative system for radioactive waste management. Specific criteria are established by NRPA in connection with the licence review (every tenth year), the three year status reports, and the discharge permits. This to ensure that criticality and the removal of residual heat are adequately addressed, that generation radioactive waste is kept to the practicable minimum, and to take into account interdependencies between the different steps in radioactive waste management.

A specific requirement and philosophical premise for both currently operating and new facilities is that the burdens on future generations emanating from present day nuclear activities shall not be greater than those permitted for the current generation.

Protective measures providing for the effective protection of individuals, society and the environment constitute an integral part of the national framework legislation with due regard to internationally endorsed criteria and standards.

Article 12. Existing facilities and past practices

The Norwegian facilities for radioactive waste management were built 25 to 40 years ago (except the Himdalen facility described under article 14), and have been continuously modernised with an aim to the enhancement of safety. The Norwegian authorities have carried out continuous inspections and reviewed and enforced safety procedures in connection with licence applications. These practices were also in effect at the time that the Convention came into force.

<u>Retrieval of a near surface LILW repository.</u>

As a result of the discussions preceding the construction of the Himdalen facility, the Norwegian Parliament decided that a shallow ground repository on the premises of the Institute for Energy Technology (IFE) at Kjeller should be retrieved and its contents transferred to Himdalen. The repository contained 997 drums and 19 other items of low and intermediate level radioactive waste which had been buried in clay in 1970. Retrieval of the drums started in August 2001 and was completed after 11 weeks

of work. The Norwegian Radiation Protection Authority as well as the local community and media were kept informed throughout the process.

The waste drums were in remarkably good condition and the handling of them caused no significant problems. The original drums were cemented into slightly larger drums prior to preliminary storage at IFE and subsequent transport to Himdalen. Radiological monitoring of the remaining clay in the hole showed contamination far below the relevant clearance levels granted by the Norwegian Radiation Protection Authority. The total dose received by the involved personnel was less than 2.1 millimansievert. The total cost of retrieval, repacking, internal transport and radiological and environmental control was 3.6 million NOK. (The Himdalen related costs (transport and disposal/storage) are not included here.)

Of the 997 drums 166 are "plutonium drums", containing a total of 30 grams of plutonium-239/240 originating from the former Uranium Reprocessing Pilot Plant's treatment of spent fuel from the first JEEP reactor. In accordance with the same Parliament decision, these drums shall be placed in the storage hall of the Himdalen facility.

Environmental clean-up.

In the early spring of 2000, the Institute for Energy Technology at Kjeller removed from the bed of the nearby Nitelva River about 180 m^3 of sediment contaminated by plutonium from liquid waste discharges in the years 1967-70. The liquid waste was generated in conjunction with the operation of the Uranium Reprocessing Pilot Plant (shut down in 1968). The Norwegian Radiation Protection Authority required that sediments with a concentration of plutonium and americium isotopes (^{239}Pu, ^{240}Pu and ^{241}Am) exceeding 10 Bq/g were to be removed from the river bed. This part of the river bed had been accessible to the public the last few years due to low river water levels over the course of a few weeks every spring. Thus NRPA considered the contaminated sediment to be of potential risk to the public, even though the hot spots now were more than 50 cm below the sediment surface. The most contaminated layer of sediment (16 m^3), with a mean concentration of about 50 Bq/g and hot spots of the order of 100-1000 Bg/g, has now been disposed of in Himdalen, while the remaining part, having a mean concentration of about 2 Bq/g, is stored on IFE premises. The costs of the clean-up operation were about four million NOK.

Later that year, IFE decided to retrieve the 900 meter long section of a disused liquid waste discharge pipeline buried in the bed of the Nitelva River. It was replaced in 2000 by a new and shorter pipeline leading to a new discharge point about 800 m upstream of the old one. The clean-up operation was performed in March 2001. The retrieved pipeline was cut into two meter long pieces and brought to the Radioactive Waste Treatment Plant at IFE. At one location plutonium-contaminated sediment was detected. The concentrations spot (widely?) exceeded the Norwegian Radiation Protection Authority's clearance levels granted for Nitelva River sediment. About 40 m^3 of sediment were therefore removed and transported to IFE for treatment and subsequent disposal in the Himdalen facility. The costs of this second clean-up operation were about 0.8 million NOK. This time, much effort was expended to provide information to media and the local community throughout the process.

Article 13. Siting of proposed facilities

Article 14. Design and construction of facilities

Article 15. Assessment of safety of facilities

Before any new buildings for nuclear activities could be built in Norway, all of the obligations in these articles would have to be met and decommissioning plans would have to be established. Among these obligations is the requirement to consult Convention Contracting Parties in the vicinity. At this time Norway has no plans to construct any new facilities.

The combined disposal and storage facility at Himdalen.

The process to select a site for the disposal of low and intermediate level radioactive waste in Norway started in 1989 when a steering committee was appointed by the government to investigate possible solutions for final disposal of all Norwegian low and intermediate level waste.

In 1992, the Directorate of Public Construction and Property (Statsbygg) prepared its impact assessment for a repository for Norway's low and intermediate level waste in accordance with the Planning and Building Act. Three sites, the Killingdal Mine together with Kukollen and Himdalen in the Kjeller vicinity, were evaluated. The steering committee nominated Himdalen, 25 km from the Kjeller waste conditioning plant, as the preferred site, and recommended that an engineered rock cavity facility be located there. During the Parliamentary committee deliberations on this recommendation it was proposed that the new facility should be a combined disposal and storage facility, with the capability of storing some of the plutonium bearing waste and dispose of the short lived waste.

In April 1994 the Storting (Parliament) decided to that at the Himdalen site it should be a combined facility and to proceed with technical investigations there. It had also been recommended that an IAEA – WATRP (Waste Management Assessment and Technical Review Programme) review should be performed before granting any construction licence, and in December 1994, NRPA sent such a request to IAEA. The scope of the review included review of the legal framework, long term safety and the site selection process. In September 1995 a review meeting was convened in Oslo where the WATRP team and IAEA representatives met with Norwegian experts and also visited the Himdalen site. The investigating team declared itself satisfied with Himdalen within the scope of the review and approved it as a suitable site with the technical concept as proposed.

In accordance with the Act on Nuclear Energy Activities, Statsbygg's application for a building licence along with the safety analysis reports was sent to NRPA in March 1996. The licence was granted in February 1997 and construction started soon after.

In July 1997, the Institute for Energy Technology (IFE)'s application for a licence to operate the facility was sent along with the safety report to NRPA. The licence was granted in April 1998. The Statsbygg safety report with updated safety analyses and verification of site-specific criteria were sent to NRPA in September 1998. In March 1999 all needed documentation was in place and NRPA granted IFE permission to begin operation. IFE's operation licence is valid for a 10 year period.

The facility is built into a hillside in crystalline bedrock. It has four caverns (halls) for waste packages and one slightly inclined 150 metre long access tunnel for vehicles and personnel. All of the caverns and the access tunnel have a monitored water drainage system. A service and control room with certain service functions for the personnel and a visitor's room is located along the tunnel. The rock caverns are excavated in a way such that about 50 meters of rock covering remains. The geological covering is for protection against intruders, plane crashes and other untoward events, although it is not intended to be act as a main barrier in long term safety calculations.

In each cavern two solid sarcophagi have been constructed with a concrete floor and walls. When a section of the sarcophagus has been filled, a roof will be constructed. The roof of the sarcophagus will be shaped to shed infiltrating ground water and a waterproof membrane will be fixed to the concrete roof. Three caverns will be used for waste disposal in which drums and containers will be stacked in four layers. When one layer in a sarcophagus section has been filled with waste packages it will be encased in concrete.

One of the caverns will be used for storage. The decision whether to retrieve the waste in the storage cavern or dispose of it by encasing it with concrete will be made based on experiences during the operational period and safety reports that will be prepared for closure of the facility, expected about the year 2030. There are no plans to retrieve any of the waste placed into the storage facility during operation.

For the long term safety of the facility, the Norwegian legal system provides for two basic requirements that must be fulfilled:

- Future generations have the right to the same level of radiation protection as the present generation.
- Except for a certain period of institutional control of 300 to 500 years, the safety of the facility should not rely on future surveillance and maintenance.

Safety criteria set by the Norwegian authorities are as follows:

- For the most likely scenarios and based on realistic calculations, doses to the most exposed individuals should not exceed 1 μSv per year..
- For other scenarios, a dose of 100 μSv per year to the potentially most exposed individuals should not be exceeded.

The dose criteria are lower than those usually used and internationally recommended. One reason for this is to keep the dose limits at the same level as discharge levels at the IFE facilities. The radiation emitted by the waste should not give higher doses than the beneficial operation of the reactors. It is also possible to achieve these low levels because of the relatively small activity of the inventory in the repository.

Article 16. Operation of facilities

Some of the waste management facilities were constructed before the Act on Nuclear Energy Activities went into force in 1972. Consequently this law did not regulate the original design and initial construction of the facilities. Nevertheless, the design and construction of the Norwegian facilities have been consistent with international practice. Later modifications have been subject to approval by NRPA and regulated through operational limits and conditions in accordance with the Act and requirements set in the licences.

In the case of the Himdalen facility constructed in 1997-98, the licence to operate the facility is based on safety assessments as specified in Article 15. The findings obtained during operation of the facility will be used to verify and review the validation assumptions and to update the safety assessments for the period after closure.

Any incidents will be reported, in a timely manner, to the NRPA. Initial decommissioning plans will within this exciting licensing period have to be developed by the operator, IFE, and sent to NRPA for review and approval. The Himdalen facility is not part of the decommissioning plans.

Article 17. Institutional measures after closure

An institutional control period of 300-500 years will be effected for the Himdalen facility (the exact time will be determined at the time of closure). Monitoring of the area will be implemented and there will also be restrictions of the use of the land.

In conclusion for section H it is found that the Norwegian regulatory system implements all obligations under Articles 11, 12, 13, 14, 15, 16 and 17.

Section I. Transboundary Movement

Article 27. Transboundary movement

All nuclear activities, including transboundary movements, are regulated by the Act of 12 May 1972 No. 28 on Nuclear Energy Activities with regulations and Act 12 May 2000 No. 36 on Radiation Protection and Use of Radiation with regulations.

Norway does not export spent nuclear fuel or radioactive waste. However, irradiated nuclear fuel as test specimens are imported from participants in the OECD Halden Reactor Project for further irradiation in the Halden Boiling Water Reactor. After irradiation, these specimens are usually exported back to the owner for further investigation and study. A few of these specimens are studied at the laboratories at Kjeller. This generates some small waste amounts which is disposed of with the low- and intermediate level waste. The rest is repacked and returned to the owner. All transfers to and from foreign countries must be authorised by the regulatory body, i.e. to ensure compliance with the provisions of the Convention on the Physical Protection of Nuclear Materials and other conventions.

Transit transportation in Norway of nuclear material in general is not permitted without a licence. So far, such transits have never been performed.

Section J. Disused Sealed Sources.

Article 28 Disused sealed sources

Regulation no. 155 of 1 March 1983 concerning the "production, import and distribution of radioisotopes" specifies the Norwegian Radiation Protection Authority (NRPA) as the regulatory body for all aspects of handling radioactive sources.

It is the responsibility of the licence holder to ensure that disused sealed sources are handled in a safe manner, and that they are ultimately either returned to the manufacturer or sent to the Institute for Energy Technology (IFE). The waste treatment plant at IFE will accept, treat, store and dispose of disused sealed sources in a safe manner. (The Jeep II reactor at IFE produces sources and hence IFE is also a manufacturer.)

When NRPA issues licences for companies to buy, sell or use sealed sources, it is with the requirement that the sources are "returned" to the manufacturer. The practical implementation of this means that the sources are re-exported to a manufacturer abroad or sent to IFE for disposal in Norway. It is a strict requirement for the re-export of Am-241 sources. Norway does allow for the re-entry of disused sealed sources. This activity is not regulated in the national law and NRPA issues import licences on a case by case basis. This will also be the case for Norwegian-produced instruments with a sealed source that may be produced in a third country.

This area of work is currently being emphasised in overall Norwegian regulatory efforts in order to establish a more transparent overview, improved systems for keeping track of sealed sources as well as an increased awareness of the fact that imported sources will be re-exported after their useful life.

Section K. Planned Activities to improve Safety

It is a general goal to improve the operational safety of Norwegian nuclear installations. There are at present no special ongoing activities aimed at improving safety. However, when assessing plans for the development and refurbishing of the country's nuclear installations, improved safety will be a main priority.

Section L. Annexes

References to national laws, regulations, requirements, guides etc.

Act of 12 May 1972 No. 28 on Nuclear Energy Activities

Act of 12 May 2000 No. 36 on Radiation Protection and Use of Radiation

Regulation no. 155 of 1 March 1983 "production, import and distribution of radioisotopes

STATENS STÅLEVERN, Norwegian work on establishing a combined storage and disposal facility for low and intermediate level waste (Report 1995:10), IAEA-WATRP review team, (1995).

NOU 2001:30, Evaluation of strategies for final disposal of high level reactor fuel (in Norwegian).

4 Questions and Answers

Norway received 94 questions/ comments from 11 other contracting parties. Here is a compilation of the questions and the answers that NRPA gave to the questions/comments. They are sorted according to the articles in the Convention. The material is confidential but Norway has chosen to make it publicly available, in an anonymous form, since it is an important part of the Norwegian documentation for the first Review meeting.

Article: 4, 10

Ref. page: section G
Question:
What measures have been adopted to prevent the "cladding" degradation of Spent Fuel due to ageing?
Answer:
The SF is stored dry except for the SF in Halden generated after 1970 which is in a wet storage. This SF is cladded with zircaloy.

Article: 5
Ref page: 13, section G
Question:
What are the surveillance/monitoring methodology or system, including criticality prevention, detection, and any other safety conditions for the remaining solutions of a decommissioned reprocessing test facility?
Answer:
The U- solution is stored in stainless steel tanks placed in trays to collect leaks if any. Moisture detectors will give alarm if leaks would occur. No need for criticality prevention.

Article: 5, 10
Ref page: 13, section G
Question:
Section G provides information on the current storage conditions of the existing inventory of spent fuel and solutions of uranium containing plutonium and fission products from the now decommissioned reprocessing test facility. Given that some of the fuel is 42 years old, what is the design life of existing storage facilities (or when will these facilities be too old to safely store the fuel) and when will a new storage or disposal facility likely be identified and established for the next stage in the disposition of Norwegian spent fuel?
What is foreseen for the conditioning of SF regarding its final disposal?
Answer:
It is anticipated that IFE will have storage capacity for SF in existing facilities for 10-15 years more; besides normal maintenance, no upgrading activities are foreseen.

It is not decided yet. These days a committee will be appointed by the Ministry of Trade and Industry to assess and give recommendations for further storage and disposal of SF. It is foreseen that a new storage facility will be built and the SF stored for 40-60 years. The SF today stored at IFE will then be moved to the new facility. Other items, (long lived, some sealed sources, some decommissioning waste) that can not be disposed of in the present facility in Himdalen will also be stored/disposed of in these facilities. A new storage facility may be in operation 2010-2015.

Article: 7
Ref page: section G
Question:
How the safety is ensured in the storage of SF that has been used for post-irradiation examinations?
Answer:
It is stored in the facilities at IFE until it is returned to the owners of the SF. Same safety as for the Norwegian SF.

Article: 8
Ref page: section G
Question:
Have safety assessments been performed for storage of such type of SF?
Answer:
Yes, as a part of the licensing of the storage facilities.

Article: 8, 15
Ref page: 13,14 and 17-21
Question:
Under what criteria are environmental impacts of spent fuel / radioactive waste management facilities assessed? What aspects are covered by this

assessment? Who is responsible for the EIA? Who reviews the assessment?

Answer:

The Impact Assessment that is required within this license period will cover aspects of all nuclear facilities at IFE. In connection with the planning of a disposal facility for LILW in Norway an IA was performed in 1992, Statsbygg was responsible. NRPA reviews the assessments. (Environmental) Impact Assessments in Norway are sent out for public hearings.

Article: 9
Ref page: section G
Question:

What are the inventories of stored SF that has been used for post-irradiation examinations?

Answer:

For the Norwegian SF it is included in the inventory on p.5.

Article: 9
Ref page: 13,14 section G
Question:

How is information on operational experience collected and analysed and how are appropriate measures identified based on this analysis?

Answer:

IFE.

Article: 9
Ref page: 13,14 section G
Question:

How will the requirement of Joint Convention Article 9 vi?) to update decommissioning plans of spent fuel management facilities be met if these plans, according to G. 4 Article 9, have not been developed?

Answer:

The general plans exit. They will be further developed according to WS-G-2.1.

Article: 10
Ref page: section G
Question:

What are the plans for the future storage or disposal of such type of fuel?

Answer:

SF from post-irradiation examinations is of foreign origin and is returned to the owner.

Article: 11
Ref page: 15, section H
Question:

Could it be specified the criteria applied in connection with the licence review of RWM facilities?

Answer:

For the Himdalen facility certain criteria were established when the work with the design and investigations of the site started. These had to be justified in the safety reports. For the facilities at the IFE sites the application is for a renewal of the license, new criteria may be given, or in most cases the safety reports have to be updated to reflect changes and that all requirements (criteria) given for the present license period have been fulfilled. Licenses are renewed every 10 year. NRPA does not use any specific criteria during the review process.

Article: 11
Ref page: 15, section H
Question:

Comment: Existence of procedures for ensuring waste management continuity from generation to final disposal could be mentioned, if any

Answer:

No specific procedures issued by NRPA. Procedures within the IFE QA system. IFE has only control when the waste is delivered to them, they do not check or have any procedures regarding waste treatment at generators. For transportation ADR regulation will apply. IFE check for contamination, no check when the waste arrives at Himdalen (all waste packages are first stored at IFE). IFE is transporting the waste to Himdalen, IFE is unloading and placing the waste in the facility). Only waste fulfilling criteria give in the safety report may be disposed of in Himdalen (specified as nuclides, max total amount of activity).

IFE may apply to NRPA for any disposal of "other" waste forms.

Article: 12
Ref page: 16, section H
Question:

During the environmental clean-up, were fission products found in the removed contaminated sediments?

Answer:

Yes, together with Pu and Am

Article: 12
Ref page: 15, section H
Question:
Could Norway complete this chapter by providing brief descriptions of all the existing facilities (including the old ones) and their regulatory status?
Answer:
All existing waste management facilities are described in the report. No other old or former facilities.

Article: 12
Ref page: 18, section H
Question:
What is the capacity of the Himdalen disposal site? (m3 and activity)?
Answer:
200 m3. Approx 520 TBq.

Article: 12
Ref page: 15, section H
Question:
The discussion of "Existing facilities and past practices" indicates the radioactive waste management facilities in Norway have been continuously modernized to enhance safety and that the Norwegian authorities have carried out continuous inspections and reviewed and enforced safety procedures. What mechanism is in place to ensure that changes to a nuclear facility are made in accordance with regulatory requirements and that they are reviewed and approved by a responsible government authority before they are implemented?
Answer:
IFE report back. Inspections to check and verify. Applications for permits to (re) start work/operation from IFE to NRPA. Assessed and accepted by NRPA.

Article: 13- 15
Ref page: 18, section H
Question:
Could it be provided the WATRP commission conclusions?
Answer:
Within the scope of the review, the team is satisfied with the overall approach taken by the responsible Norwegian organisations in the development of a storage and disposal facility for LILW. Based on the existing information the review team believes that the Himdalen site, in combination with the engineering concept (sarcophagus) can be suitable for the storage and disposal of the relatively small amounts of Norwegian LILW. The review team emphasizes that it is only necessary to find a suitable site, and in fact it is not possible to find the best site. Further details can be found in Strålevern Report no 1995:10.

Article: 13-15
Ref page: 19, section H
Question:
The Report mentions that in Himdalen there are 50 m of rock above caverns and it is not intended that this barrier will act as a main barrier in the "long term safety". What safety measures are foreseen in the repository for RW containing long-lived nuclides?
Answer:
The engineered barriers, which will keep the waste dry.

Article: 13-15
Ref page: 21, section H
Question:
Safety criteria set by the Norwegian authorities are refered to more or less probable scenarios. Clarification on the topic is needed. Which criteria are applied to define the more or less probable scenarios proposed for long term safety?
Answer:
More or less probable may not be a very good distinction, even if this is the wording that was used. Calculations for several scenarios were performed and a total judgement of the results was performed.

Some examples to illustrate what kind of scenarios: Drilling a well from above into the facility (it will be no water to be found). In Norway normally you have the well close the house. Drilling a well just outside of the facility into the drainage pipe. The tunnel is backfilled after the operation and the density is less than in the surrounding mountain. Leakages from the repository into the ground water and then water is taken from a well in the (close by) area. The drainage system is blocked and not functioning and the facility is fully or partly filled with water. Leakages to close by waters (a small creek).Gas scenarios, both when the facility is dry and water filled.

Article: 13
Ref page: 21, section H
Question:
How will the requirement of an institutional control of 300 to 500 years be fulfilled? Is such a long control necessary?
Answer:

It has not been decided yet. "Political" decision, exact will be evaluated during the process for the closure of the facility.

Article: 13-15
Ref page: 17,18 section H
Question:
Could Norway provide a comprehensive description of the regulatory framework for facilities licensing (siting, design, construction, commissioning, modifications, dismantling) and periodic safety re-assessment? Could Norway provide detailed indication on the corresponding documents (safety reports) and reviews?
Answer:
Operation license valid for 10 years. All safety reports updated for each new application.
3 year periodic reviews are done "status reports". Review by NRPA and external expertise as required.
See annex

Article: 16
Ref page: 21 section H
Question:
Could Norway provide a presentation of the procedures related waste packages acceptance in Himdalen repository site (linked with upstream waste characterization and QA plans)?
Answer:
IFE has described their procedures for this in the safety report for the license application. When issuing the license these are accepted. No NRPA procedures.

Article: 17
Ref page: 22 section H
Question:
Is a 500-year institutional control period acceptable for disposal? How is stored the information concerning waste characteristics and location and what are the plans to keep it on such a long period of time?
Answer:
Yes, it may even be too long. A final decision will be taken during the closure process. Storage in paper based archives and electronic database, so far. No decision for the long term storage.

Article: 18, 19
Ref page: 9 section E
Question:
The independence of NRPA does not seem really effective (licenses are granted by the Government - with additional intervention of the Ministry of Health - on the basis of NRPA′s recommendations).A clarification would be convenient about this topic
Answer:
An application for license to construct or operate a nuclear facility shall be sent to the Ministry of Health. (MH) NRPA as the competent authority will be requested by the MH to handle the application. NRPA is also responsible for issuing criteria and requirements. NRPA may also request the applicant for additional investigations or information. NRPA will prepare a report for the MH with the result of the review of the application (the safety reports etc). In the report NRPA will also present any requirements that the applicant should fulfil i.e. NRPA will give its recommendation to the MH about the approval or not of the application. Based on this the MH will prepare the papers for a decision by the Government (or actually by the King in cabinet).

Article: 19
Ref page: section L
Question:
Are there any regulations or guides concerning e.g. waste management in place?
Answer:
No, there are no issued regulations. Waste management will be covered on a general basis in the new regulations being produced under the Act of 12 May 2000. This regulation are planned to come into force by 1 Jan. 2004. Otherwise requirements for waste treatment from the use of open radioactive sources are given in an old guideline from 1981.

Article: 19
Ref page: 9 section E
Question:
Could Norway provide more detailed information on the technical reviews performed by NRPA? Could Norway provide some statistics and illustration of the inspections recently performed by NRPA?
Answer:
Sorry we don't have any detailed information to give. The inspections often focus on a certain activity. For example in connection with the retrieval of the waste drums several inspections were performed. The Himdalen facility is normally inspected 1-2 times per year. This year focus has been given to nuclear security and an IAEA-

International Physical Protection Advisory Service (IPPAS) review has been undertaken for the IFE's sites in Halden and at Kjeller.

Article: 19
Ref page: 7 section D
Question:
At dose rate =10 mSv/year, lead shield is used inside the drum. What is the technology for installation of the shield?
Answer:
A smaller drum, steel drum with 2 cm of lead on the sides and 3 cm in the bottom and on the top, is placed inside the drum and 6 cm of concrete is poured between the drums. The ion exchange resin is pored into the inner drum.

Article: 19, 20
Ref page:
Question:
Legislative and regulatory systems: Section E states that NRPA is the officially designated regulatory body, but it does not have the authority to issue regulations. (i) Which body does the authority to issue regulations? (ii) Is this consistent with IAEA GS-R 1? (Legal and governmental infrastructure for nuclear, radiation, radioactive waste and transport safety
Answer:
The NRPA is the regulatory body for nuclear and radiation safety, even though we do not have the authority to issue regulations. Apart from this, the NRPA has the proper authority according to the 14 listed elements in §2.6 in the IAEA GS-R-1. Regulations are issued by the Ministry of Health, with NRPA providing the scientific and technical basis. In general, authorizations for using radiation sources are issued by the NRPA, while licences for operating nuclear facilities are granted by the Government. This is inconsistent with IAEA GS-R-1, although the IAEA safety series 115 (BSS) acknowledge the fact that the functions of the regulatory authority may be divided between different authorities. See annex.

Article: 19, 20
Ref page:
Question:
Please elaborate on the Act of 12 May 2000 Nos. 28 and 36 on nuclear energy activities and radiation protection and the use of radiation, specifically on the regulations pursuant to the Act, and on the guidelines and requirements associated with licenses and approvals
Answer:
Regulations are being produced under the Act of 12 May 2000. This regulation is planned to come into force by 1 January 2004. NRPA is working on stabling Guidelines, for the implementation of the new regulation and as help for the users. See annex.

Article: 19, 22
Ref page: 8,9 section E
Question:
What requirements for radiation safety does the regulation impose?
Answer:
20 mSv/year. Exceptions can be made (if applied for) for certain workers, as long as the 100 mSv during a five year period is maintained.

Article: 19, 26
Ref page: 9 section E
Question:
What are the responsibilities of the different parties involved in spent fuel and radioactive waste management in Norway
Answer:
Parliament; Policies and laws. Government; Licenses. Ministries; regulations.

NRPA; permits, guidelines, inspections. IFE, operation of facilities, waste generator. See annex.

Article: 22
Ref page: 10 section E
Question:
Which are the established criteria used by NRPA for applying sanctions to IFE ?, and what is the nature of such sanctions ?
Answer:
There are no specific criteria. Any requirements from NRPA may be appealed to the MH. This is a general right in the Norwegian civil service system. NRPA may withdraw the permit to operate (for all or some facilities) if or when needed if sanctions are not followed or the safety is not adequate. NRPA has the authority to give "fines" either as one time sum or as "fines per day" if NRPA sanctions are not followed.
For criminal activities NRPA may report to the police.

Article: 22
Ref page: 10 section F
Question:
No information is provided for Article 22 on human and financial resources. How are resources provided

for management of spent fuel, radioactive waste, and decommissioning?

Answer:

NRPA receives funding from MH. IFE: Governmental funding and income from research contracts.

For the operation of Himdalen, governmental funding by MTI to IFE. New facilities will be financed by governmental funding and most probably built and owned by Statsbygg (Directorate for state properties). They own most of the Governmental buildings in Norway, also the Himdalen facility.

Article: 23
Ref page: 10 section F
Question:

Is the applied QA system coherent with ISO and IAEA Guides? It seems that it covers only operation (design, construction and commissioning are not mentioned). A description of the quality systems implemented by the organisations that handle radioactive wastes and SF would be convenient.

Answer:

The system at IFE follows guides given by IAEA. Today no design, construction or commissioning activities are ongoing or planned at the IFEs facilities. I n Norway it is only IFE that handles radioactive waste and SF. Waste generators (besides IFE) as hospitals and universities would have their own QA systems. They will follow ISO and other Norwegian requirements.

Article: 23
Ref page: 10 section F
Question:

NRPA is supervising the QA system of IFE. Does NRPA have its own QA system?

Answer:

NRPA has a QA system concerning health, environment and safety.

Article: 23
Ref page: 10 section F
Question:

Please elaborate on the steps taken to ensure QA programs for the safety of spent fuel management and radioactive waste management are established and implemented?

Answer:

IFE has the responsibility. IFE elaborates and implement the plans and procedures. NRPA verify and check. All organisations in Norway are obliged by law to have an " Internal Control" system, concerning health, environment and safety.

Article: 24
Ref page: 11
Question:

Has a permissible radiation dose limit been set for pregnant women or women of child-bearing age who work in the controlled area?

Answer:

Pregnant workers are subjected to a dose limit of 1 mSv for the rest of the pregnancy, i.e. after the pregnancy has been diagnosed. There is no particular dose limit for women of child bearing age.

Article: 24
Ref page: 11
Question:

In the Norwegian report, limits for radiological releases due to discharges to water and air from nuclear facilities are described. Are there any other limits or stipulations laying down maximum individual doses for other conceivable exposures to radiation of the public from spent fuel / radioactive waste management facilities, like direct radiation etc.?

Answer:

There is no particular limit for maximum individual doses to members of the public from direct radiation given in the operational licences or discharge limits. However, new general regulations for radiation protection will come into force 1 January 2004, and they will contain a general requirement that no enterprise may expose individual members of the public to doses above 0.25 mSv per year. This includes internal and external exposure.

Article: 24
Ref page:
Question:

Operational radiation protection: Section F states that IFE has developed a system of work planning to keep the doses to the staff ALARA. Are both social and economic considerations taken into account in this system? Note IAEA SS 115 (RP Fundamentals) sections 2.24 &2.25

Answer:

IFE's system of work planning and dose budgeting involves intuitive qualitative analysis including social

and economic considerations according to IAEA SS 115, sections 2.24 and 2.25.

Article: 25
Ref page: 12 section F
Question:
The Report sets that "No countermeasures are automatically implemented purely on the basis of a declaration of a given level of emergency, and it will be implemented on an ad-hoc basis depending on the assessments of the situation." In some emergency situations, for people living very near the facility, the implementation of protective actions immediately after the emission begins would be necessary. These cases arise when there is no time to perform assessments before the application of countermeasures. For such cases the question is: What is the scope of "assessment of the situation"? Is it referred to the state of the facility (on-site) or to the off-site consequences?
Answer:
In Norway (at NRPA) the work on implementing the IAEA standard for emergency planning is actively ongoing. GS-R-2, zones for planning purposes, classification of the emergency situation and so on.

The evaluation regarding the need for countermeasures is done in respect to the off-site situation. On-site measures such as evacuation may be applied, based on the parameters of the facilities.

Article: 25
Ref page: 11, 12
Question:
Is there a distributed environmental monitoring network in Norway?
Answer:
Yes. The Norwegian Institute for Air Research (NILU) has an air monitoring system with 30 measuring points, around the country, with continues monitoring. The Local Radioactivity Control, system has measuring equipment placed at the local laboratories within the Norwegian Food Control Authority, at 59 places in the country. Primarily for measuring food. NRPA has 5 air monitoring systems.

Article: 25
Ref page: 11, 12
Question:
What are the duties of the operator of a spent fuel / radioactive waste management facility, both of a precautionary nature and in the event of an actual accident in his plant (obligation to pass on information, provision of expertise, provision of specially trained personnel, etc.)?
Answer:
Develop an emergency plan. Keep in contact with the police and inform them. Physical protection systems alarm the police. Any incidents or emergencies shall be reported to the NRPA.

Article: 25
Ref page: 11, 12
Question:
Are emergency exercises conducted with other countries?
Answer:
No, not regarding IFE's facilities as the scenarios. Other emergency exercises are conducted with other countries.

Article: 25
Ref page:
Question:
Emergency preparedness: Section F describes the emergency response plans. Are the emergency plants tested? If so, how and with what frequency? Note: IAEA GS-R-2 (Preparedness and response for a nuclear or radiological emergency) section 5.33
Answer:
Yes, the plans are tested. IFE has not had a major test regarding radioactive waste. An exercise was performed where an accident acc occurred during a transport of radioactive waste.

Article: 25
Ref page: 11 section F
Question:
Off-site response is planned by local police. Page 12 states "no countermeasures are automatically implemented". Please describe roles and responsibilities for preparing emergency response plans and the standard operating procedures reflected in those plans?
Answer:
The off-site response is planned by the local police (they are the acting part), the municipality, the regional Governor and the Crises Committee. At the time being work is going on for harmonisation of the respective plans and implementation of GS-R-2. Besides each sector has their own responsibility.

Article: 25
Ref page: 11 section F
Question:
Specific emergency plans exist for each site. What do these emergency plans comprise? Are there any prepared protective measures? If yes, what are they?
Answer:
Yes, specific plans exist for each site. In the plans activities such as notification, establishment of emergency systems, responsibilities are described. IFE may effectuate evacuation on-site. Off-site – IFE- until the Crises Committee is operating – will act as an adviser for the police, who will effectuate the evacuations.

Article: 26
Ref page: 12 section F
Question:
Who controls and assesses in which manner the plans for the decommissioning of the facilities of the Institute for Energy Technology to ensure the safety of decommissioning of their nuclear facilities and in which manner is this done?
Answer:
The NRPA has this function.

Article: 26
Ref page: 12 section F
Question:
Please elaborate on Norway's decommissioning program and the regulatory process applied, including identification of the facilities to be decommissioned, decommissioning planning, release criteria for materials and sites, recordkeeping provisions, etc
Answer:
Today it is at an early planning stage. IFE shall develop the plans. Clearance levels will be discussed.
Follow structures as in WS-G-2.1 "ongoing planning.

Article: 27
Ref page: 22 section I
Question:
Can the information about the fulfilment of Art. 27 point 1 be enlarged?
Answer:
The SF that is imported and exported to and from Norway is owned by the countries that participate in the OECD Halden project. These counties fulfil the requirements as stated in the Art. 27.1. 20 countries participate

Article: 27
Ref page: 22
Question:
Is demanded a notification for the transboundary movements?
Answer:
For the fuel yes, certainly. Yes in reality because transport of radioactive waste will go into the EU. Formally no export license is required for RW.

Article: 28
Ref page: 23 section J
Question:
The regulatory criteria for very low activity sealed sources and high activity sealed sources should be clarified. Taking into account that the possession of disused sealed sources by users could increase the probability of losing control of them, it would be convenient that measures provided for preventing orphan sources should be explicitly mentioned?
Answer:
Existing regulation in Norway does not distinguish between very low or high activity sources. The holders need an authorization. The authority (NRPA) does have the possibility to deviate from this, and for some range of application the distributor hold the authorization and have the duty to report on yearly bases to NRPA.Regulation becoming operative 2004.01.01 does however distinguish between very low, medium and high activity sealed sources. To hold a high activity sealed source an authorization is needed. To hold a medium high activity source a notification has to be sent to the authority, but for very low activity sources no authorization or notification is needed. Roughly very low sources are below exemption level (IAEA Safety Series No. 115) and medium high sources are typically industrial gauges. Comparison between the holder inventory and NRPA's database of industrial gauges have a number of times shown differences. In pending of the new regulation NRPA is using their administrative routines to follow up more tightly all the holders of sealed sources.

Article: 28
Ref page: 22 section J
Question:
Please provide more information on disused sealed sources. Does the regulator maintain a database on sealed radiation sources in Norway? Are there any statistics of orphan radiation sources discovered in Norway or at Norwegian border controls? Who is paying for the treatment, storage and disposal of

spent sealed sources to be carried out by IFE? Where are the sources planned to be disposed of?
Answer:
The authority (NRPA) keeps electronically records of sealed sources in:
Industrial radiography, Well logging, Industrial gauges, Blood irradiators, Medical therapy.
Other ranges of application are kept in our ordinary files. This is not optimal, but because Norway is a small country, and has a limited number of sources, this is to a certain extent still perspicuous. The respective owner pays for the treatment and storage at IFE. The cost for disposal in Himdalen is covered by governmental funding (MTI pays IFE for the operation).

Article: 28
Ref page: 22 section J
Question:
Does Norway have a central registry for sealed radioactive sources, and if not, are there plans to set up one?
Answer:
Norway does not have a central register of all sealed sources, but in the proposal for the state budget 2004 some money are earmarked to start the planning of such register.

Article: 28
Ref page:
Question:
Disused sealed sources (i): Describe the regulatory requirements for long-term storage facilities for disused sealed sources. Specifically, what safety precautions including monitoring activities are required during handling and storage of disused sealed sources?
Answer:
The same requirements as for other radioactive waste. If the sources can not be returned (exported) to the manufacturer they will be sent to IFE for treatment storage and or disposal.

Article: 28
Ref page:
Question:
Disused sealed sources (ii): What regulatory procedures are there to deal with a disused sealed source where the owner is unknown (so called "orphan sources")?
Answer:
We do some investigation to find the owner. If the owner is not found, NRPA will pay for the disposal of the source. If the source is found to be deliberately orphaned or by negligently act, the owner would be taken to court. So far we have no such experience.

Article: 28
Ref page: 23 section J
Question:
Do you have information about orphan sources in your country?
Answer:
Finding orphan sources in Norway are very rare. More often we are missing sources from our inventory. The holder does not have them anymore, or the holder does not exist anymore. We do have information on orphan sources, but not listed or organized in a special manner.

Article: 28
Ref page: 23 section J
Question:
Are there any radiation monitors for example at points of entry into or out of the Country by either sea or land to detect orphan sources?
Answer:
At the Storskog border point (Norway-Russia) a monitoring portal will be in operation later this year.

The customs also have other (portable) measuring equipment. NRPA assist them (2nd line services).

Article: 28
Ref page: 23 section J
Question:
Do you have control monitors to detect orphan sources before they may reach a foundry and be melted?
Answer:
Most of the private companies have equipment.

Article: 28
Ref page: 23 section J
Question:
Section J states it is a strict requirement for the re-export of Am-241 sources. Are options available for all license holders in Norway using Am-241 sealed sources to "re-export" for disposal their disused Am-241 sources? If not, how are these sources managed?
Answer:
There is no disposal for long lived waste in Norway. The LILW disposal in Himdalen is not approved for more than 4.6 TBq Am-241. Re-export of Am-241

is therefore required. The option to re-export is to store it at Kjeller, pending for a disposal facility for spent fuel and long lived waste.

Article: 28
Ref page: 23 section J
Question:
Section J states it is the responsibility of the license holder to ensure the safety of disused sealed sources and for their return to the manufacturer or transfer to IFE. How is safety and proper disposal assured for disused sealed sources possessed by a license holder that is having financial troubles, or that is out of business? Are license holders required to provide financial assurance for the decommissioning of their facility and disposal of disused sources? Is such financial assurance required prior to receipt or use of the sources?
Answer:
No, the licence holder is not required to provide financial assurance for disposal of disused sources. So far this has not caused any problems, but it might do in the future.

Article: 32.1
Ref page. 3 section B
Question:
Could Norway indicate whether exemption levels are currently applied and describe the corresponding procedures?
Answer:
General exemption levels do not currently apply, but decisions are made on a case by case basis, applying the exemption principles in the IAEA Basic Safety Standard.

Article: 32.1
Ref page: 3 section B
Question:
Comment: NORM residues are not considered in the document. Estimated amount, form and activity could nevertheless be indicated with the existing treatment channels?
Answer:
It is not included or handled within the treatment system described in this report.

Article: 32.1
Ref page: 3 section B
Question:
What are the treatment methods for LILW in IFE?
Answer:
Sorting, packing, solidification, incineration, cementation, ion exchange, cutting, grinding, compaction and evaporation.

Article: 32.1
Ref page: 3 section B
Question:
What is the decontamination and stabilization method of contaminated soil in IFE?
Answer:
The (retrieved) soil was not decontaminated. During the process of retrieving the waste drums, all soil was checked for contamination. Only a small fraction of the soil was contaminated and treated as waste i.e. placed in an ordinary waste drum and stabilized by mixing with concrete. The rest of the soil was placed back into the ground.

Article: 32.1 and 15
Ref page: 5 sections D and G
Question:
Remaining solutions of uranium containing plutonium and fission products from the now decommissioned reprocessing test facility are stored in stainless steel tanks in the basement of the radioactive waste treatment plant at the Kjeller site by IFE. It is unclear whether these waste tanks and waste stream is included in the facilities and inventory, respectively. Please clarify whether the stainless steel tanks with the radioactive waste solutions containing plutonium and fission products are in one of the radioactive waste management facilities mentioned on page 6 and 7, and also whether the activity and volume are in the inventory reported on page 8. Also, please identify the treatment/conditioning and disposition plans for this waste?
Answer:
The tanks are placed in the basement of the radioactive waste facility at the Kjeller site (p.6).

The amount is reported in the table on page 5. It is 1000 kg of natural uranium.

Article: 32.1
Ref page: 3 section B
Question:
On which basis was the decision supported for the removal of drums in Kjeller?
Answer:
The decision was made by the Norwegian parliament. When it was decided to build a new disposal facility for LILW it was also decided to retrieve the waste from the Kjeller site and move it

to the new facility. This because it was considered better to have all waste disposed of at the same site and in a modern facility. Later IFE developed the plans and technical options for the retrieval.

Article: 32.1
Ref page: 2, 3
Question:
Is the IFE a private or state institution and who bears the costs of the activities of the IFE?
Answer:
The Research Institute for Energy and Nuclear Technology ,IFE is a independent foundation. Established in 1948. Staff of 550. Nuclear technology accounts for about half the IFE's activities, petroleum technology totals about 30 per cent and R&D in alternative energy about 20 %.In addition to contract work, long term research, including basic research in physics is carried out.. The foundation has a turnover of 434 MNOK (approx= 54 MUSD). Of the incomes of 434 MNOK 88,4 MNOK is received by governmental funding (from MTI), of this 35 MNOK (approx = 4.8 MUSD) is for nuclear activities.

The facility in Himdalen; governmental funding. Built and owned by Statsbygg (governmental organisation). IFE receives funding from MTI for the operational costs. Waste generators delivering radioactive waste to IFE pay for the treatment.. New storage and disposal facilities for SF and "non Himdalen" waste will be built by governmental funding.

Article: 32.1
Ref page: 2
Question:
Fuel of research reactor JEEP-I was partially used as loading material in a similar facility for spent fuel processing at Kjeller site. What is the current condition of reactor JEEP-I?
Answer:
Totally decommissioned. The facility is used for other purposes.

Article: 32.1
Ref page: 3
Question:
IFE stores low- and intermediate-level waste (LILW) on Kjeller site. Because of construction of a joint enterprise for LILW storage and disposal (Himdalen), this radwaste is to be re-disposed from Kjeller trenches to Himdalen. Is there feasibility study of modifying a part of facilities for storage into facilities for disposal?
Answer:
The waste disposed of in the trenches at IFE Kjeller site has been retrieved, repacked and moved to the facility in Himdalen. Out of the drums retrieved 166 are placed in the storage part of the Himdalen facility (to be moved or to be encased in cement later) the rest of the drums are directly disposed of . The storage part of the Himdalen facility has the same design as the disposal part. All waste packages placed here shall be in a disposal ready form. They will be moved, or encased in concrete in the same way as in the disposal part. It is not a storage facility in "normal" sense where you take waste in and out.

Article: 32.1
Ref page: 4 section D
Question:
How long is spent fuel cooled in the water cooling pond before its location in the dry compartment?
Answer:
2-3 years or more.
Article: 32.1
Ref page: 5 section D
Question:
Remaining U with some quantity of Pu and fission products of the decommissioned facility for spent fuel processing are stored in tanks in the foundation part of the radwaste processing facility. How was subcriticality of these products proved?
Answer:
It is natural uranium contaminated with traces of Pu. It is a total content of 1000 kg.

Article: 32.1
Ref page: 3 section B
Question:
Some spent fuel has been sent abroad (to Belgium) for reprocessing. What happened with the uranium and plutonium gained from the reprocessing? Did Norway take back radioactive waste resulting from the reprocessing of that spent fuel? If yes, what has happened with that waste?
Answer:
SF from the Halden reactor was reprocessed in Belgium in 1969. The U and Pu was sold and the waste was disposed of in Belgium.

Article: 32.1
Ref page: 3 section B
Question:
Is there a procedure in place for removal of control from very low level waste (clearance)? What are the

criteria, are there pertinent regulations in place and how they are applied in practice by different waste generators?
Answer:
There is no general procedure or limits for removal of control from very low level waste. Decisions are made on a case by case basis, applying the exemption principles in the IAEA Basic Safety Standard.

Article: 32.2
Ref page: 5 section D
Question:
What is foreseen for the reprocessing liquid wastes that are stored in stainless steel tanks? Are there any studies being carried out regarding its treatment and conditioning?
Answer:
IFE has studied and evaluated possible treatment options. They will be conditioned by precipitation and filtering. The resulting ammonium distillate will be disposed of in the same facility as the SF.

Article: 32.2
Ref page: 5 section D
Question:
It would be convenient to provide information about the enrichment of stored spent fuel and the number of stored items with the aim of helping to appreciate the safety criteria applied?
Answer:
The spent fuel is low to medium enriched (up to 13 %), most around 6 % or lower.

Article: 32.2
Ref page: 5 section D
Question:
The Table on page 8 neither uses the categorization of wastes of page 7 nor refers to other classification scheme. It would be convenient to present the table according to the adopted classification criteria?
Answer:
For future reports the waste inventory will be reported in more detail. At present we don't have strict set of classification criteria of waste in Norway. The system is in a transition phase.

Article: 32.2
Ref page: 8 section D
Question:
Is the inventory of HLRW generated during SF reprocessing, included in the Table of page 8?
Answer:
No. This is not HLW (not heat generating). It is included in the table on page 5, MBA-B.
1000 kg of natural uranium stored at the IFE site.

Article: 32.2
Ref page: 8 section D
Question:
It is not clear whether the information about Plutonium mass (in mg) is additional data to the gross activity expressed before. If it were another item, the activity should be informed.
Answer:
Yes it is additional. The amount of Pu in mg is generated within IFE. Due to restrictions by the authorities, this waste is measured in mg (not converted into Bq). Old or Pu received from other generators is given in Bq. It is not included in the gross alpha activity.

Article: 32.2
Ref page: 8 section D
Question:
It is informed that in IFE, as LILW-SL, 850 drums are stored. Is there information about its content?
Answer:
Sorry no. IFE has records of the waste. For future reports the waste inventory will be reported in more detail.

Article: 32.2
Ref page: 7 section D
Question:
Comment: IAEA waste classification is applied, as far as possible, and a waste inventory is provided. It could clearly indicate the part of waste not directly produced by nuclear research.
Answer:
As per today: Approximately 60 % of the waste is generated by IFE., 30 % by Amersham (isotope production) and 10 % by others.

Article: 32.2
Ref page: 7 section D
Question:
What is the annual rate of generation of radioactive waste?
Answer:
120-150 equivalents of 210 l drums (3 m3).

ANNEX

Governmental organisations and nuclear regulatory system in Norway:

The Government of Norway is a constitutional monarchy with its executive branch headed by the King as head of State and prime minister as elected head of Government. The prime minister is head of the government and supported by a cabinet which is appointed by the King with the approval of the parliament. Laws and decrees are passed by the parliament and regulations and orders and certain licenses are generally made by the King-in-council upon advice of ministries and agencies of the Government.

The NRPA is the Governments competent authority for radiation protection and nuclear safety. It is organised under the Ministry of Health (MH) from which it receives its funding. It provides assistance and advice to all ministries on matters related to radiation, radiation protection and nuclear safety.

The Act of 28May 1972 (revised 28 August 1995) on Nuclear Energy Activities establishes the Norwegian Radiation Protection Authority (NRPA) as the highest specialist agency as far as questions of safety are concerned, within their duties and responsibilities. On the basis of the act, the NRPA functions as the institution making recommendations and giving advice to the Ministry of Health. The Act also deals with licensing procedures, permits, supervision, inspections, compensation and insurance (liabilities). In addition NRPA is the competent authority with regard to radiation protection through the Act of 12 May 2000 No 36 on Radiation Protection and the use of Radiation.

The NRPA is fully authorized through legislation, at any time, to enter a nuclear installation and surrounding area and request information necessary for the purpose of the inspection. To enable the necessary inspections to be carried out after operational interruptions or accidents, the licensees shall provide reports to NRPA. Inspections are provided by NRPA also in response to the operator's request in cases of any intended changes in construction, operation or management, which constitute a departure from approved conditions.

Licensing of a nuclear power plant is the responsibility of the Parliament, licensing of nuclear installations (nuclear research facilities) is the direct responsibility of the Government; and the issuance of permits for radioactive substances is the task of NRPA. After a license is given by the Government the nuclear facility can not start operation until permit for that is given by NRPA. NRPA is also responsible for giving permits to facilities not requiring a license for construction or operation, and also for giving discharge permits. The NRPA, in its role as the Government's senior specialist agency (authority) is responsible for making recommendations and providing advice to the Ministry in all matters relating to licenses and permits. It is empowered on its own initiative, to put into effect all such measures as it deems necessary. The Nuclear energy act and the radiation protection legislation outlines the NRPA's many responsibilities in its role as the competent authority. The NRPA is responsible for licensing shipments of nuclear material. The NRPA also issues certificates for nuclear material shipment containers and permits for repair of reactors.

The NRPA issues Guidelines, on general matters and also specific guidelines on how the requirements in the regulations can be followed.

Conditions for licensing are used to ensure that special requirements are met. The NRPA also provides directions to licensees by the way of guidelines contained in official correspondence; these are legally binding on the recipient licensee.

Licensees have the option of appeal to NRPA regarding a decision that authority has issued. The appeal process is contained in a separate generic act, the process involves a licensee appealing to the NRPA; the NRPA provides its recommendation to the Ministry of Health, which can decide. The licensee can appeal to the Government if it does not accept the Ministry's ruling. The same appeal procedures are used for all (persons, companies, organisations) complaining on a decision or an answer given by NRPA to a request.

The NRPA manages and provides the secretariat to Norway's nuclear emergency preparedness organisation. (Norway's nuclear emergency preparedness together with accident prevention efforts at nuclear installations contributes to the reduction of potential health and environmental consequences). The public authorities' responsibility for dealing with the acute phase of an accident rests with the Crisis Committee for Nuclear Accidents. The Crisis Committee, chaired by the NRPA's Director General, ensures co-ordination of the responses of a number of affected authorities and governmental agencies.

5 References

1. Convention on nuclear safety. IAEA Legal series No. 16. Vienna: International Atomic Energy Agency, 1994.

2. Sörlie AA. The combined disposal and storage facility for LLW and ILW in Himdalen in Norway. In: WM 01 Proceedings Feb. 25 - Mar. 1, 2001, Tucson, Arizona. HLW, LLW, Mixed hazardous wastes and environmental restoration : Working towards a cleaner environment. Tucson, AZ : WM Symposia, Inc., 2001. CD-Rom. www.wmsym.org.

3. The joint convention on the safety of spent fuel management and on the safety of radioactive waste management. IAEA INFCIRC/546, 24 December 1997. Vienna: International Atomic Energy Agency, 1997. (http://www.iaea.org/worldatom/Documents/Infcircs/1997/infcirc546.pdf (28.10.2003).)

4. Joint convention on the safety of spent fuel management and on the safety of radioactive waste management. 29. 09.1997. (Also in Norwegian) In: Overenskomster med fremmede stater. Oslo: Ministry of Foreign Affairs, 2001: 508-559.

(www.lovdata.no (traktater) (28.10.2003).)

5. The principles of radioactive waste management. IAEA Safety Series No. 111-F. Vienna: International Atomic Energy Agency, 1995.

6. Joint convention on the safety of spent fuel management and on the safety of radioactive waste management. Preparatory meeting of Contracting Parties 10-12 December 2001. Report of the preparatory meeting. International Atomic Energy Agency.

http://www-rasanet.iaea.org/downloads/conventions/prep-meeting-report.pdf (31.10.2003).

7. The joint convention on the safety of spent fuel management and on the safety of radioactive waste management: Rules of procedures and financial rules. IAEA INFCIRC/602, 1 July 2002. Vienna: International Atomic Energy Agency, 2002. (http://www.iaea.org/worldatom/Documents/Infcircs/2002/infcirc602.pdf (28.10.2003).)

8. The joint convention on the safety of spent fuel management and on the safety of radioactive waste management: Guidelines regarding the review process, IAEA INFCIRC/603, 1 July 2002. Vienna: International Atomic Energy Agency, 2002. (http://www.iaea.org/worldatom/Documents/Infcircs/2002/infcirc603.pdf (28.10.2003).)

9. The joint convention on the safety of spent fuel management and on the safety of radioactive waste management: Guidelines regarding the form and structure of national reports, IAEA INFCIRC/604, 1 July 2002. Vienna: International Atomic Energy Agency, 2002. (http://www.iaea.org/worldatom/Documents/Infcircs/2002/infcirc604.pdf (28.10.2003).)

10. Joint convention on the safety of spent fuel management and on the safety of radioactive waste management. Organisational meeting of Contracting Parties 7-9 April 2003. Report of the President of the organisational meeting for the first review meeting. International Atomic Energy Agency.

http://www-rasanet.iaea.org/downloads/conventions/presidents_report_org_meeting.pdf (31.10.2003).

11. Joint convention on the safety of spent fuel management and on the safety of radioactive waste management. Review meeting of Contracting Parties 3-11November 2003. Summary Report. International Atomic Energy Agency.

http://www-rasanet.iaea.org/downloads/conventions/jointconv_summary_report_finalNov19.pdf (11.12.2003).

6 Annex

International Atomic Energy Agency
INFORMATION CIRCULAR
(Unofficial electronic edition)

INF

INFCIRC/546
24 December 1997

GENERAL Distr.
Original: ARABIC, CHINESE ENGLISH, FRENCH, RUSSIAN and SPANISH

JOINT CONVENTION ON THE SAFETY OF SPENT FUEL MANAGEMENT AND ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

1. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was adopted on 5 September 1997 by a Diplomatic Conference convened by the International Atomic Energy Agency at its headquarters from 1 to 5 September 1997. The Joint Convention was opened for signature at Vienna on 29 September 1997 during the forty-first session of the General Conference of the International Atomic Energy Agency and will remain open for signature until its entry into force.

2. Pursuant to article 40, the Joint Convention will enter into force on the ninetieth day after the date of deposit with the Depositary of the twenty-fifth instrument of ratification, acceptance or approval, including the instruments of fifteen States each having an operational nuclear power plant.

3. The text of the Convention, as adopted, is attached hereto for the information of Member States.

JOINT CONVENTION
ON THE SAFETY OF SPENT FUEL MANAGEMENT AND
ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

JOINT CONVENTION
ON THE SAFETY OF SPENT FUEL MANAGEMENT AND
ON THE SAFETY OF RADIOACTIVE WASTE MANAGEMENT

PREAMBLE

The Contracting Parties

(i) Recognizing that the operation of nuclear reactors generates spent fuel and radioactive waste and that other applications of nuclear technologies also generate radioactive waste;

(ii) Recognizing that the same safety objectives apply both to spent fuel and radioactive waste management;

(iii) Reaffirming the importance to the international community of ensuring that sound practices are planned and implemented for the safety of spent fuel and radioactive waste management;

(iv) Recognizing the importance of informing the public on issues regarding the safety of spent fuel and radioactive waste management;

(v) Desiring to promote an effective nuclear safety culture worldwide;

(vi) Reaffirming that the ultimate responsibility for ensuring the safety of spent fuel and radioactive waste management rests with the State;

(vii) Recognizing that the definition of a fuel cycle policy rests with the State, some States considering spent fuel as a valuable resource that may be reprocessed, others electing to dispose of it;

(viii) Recognizing that spent fuel and radioactive waste excluded from the present Convention because they are within military or defence programmes should be managed in accordance with the objectives stated in this Convention;

(ix) Affirming the importance of international co-operation in enhancing the safety of spent fuel and radioactive waste management through bilateral and multilateral mechanisms, and through this incentive Convention;

(x) Mindful of the needs of developing countries, and in particular the least developed countries, and of States with economies in transition and of the need to facilitate existing mechanisms to assist in the fulfillment of their rights and obligations set out in this incentive Convention;

(xi) Convinced that radioactive waste should, as far as is compatible with the safety of the management of such material, be disposed of in the State in which it was generated, whilst recognizing that, in certain circumstances, safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Contracting Parties to use facilities in one of them for the benefit of the other Parties, particularly where waste originates from joint projects;

(xii) Recognizing that any State has the right to ban import into its territory of foreign spent fuel and radioactive waste;

(xiii) Keeping in mind the Convention on Nuclear Safety (1994), the Convention on Early Notification of a Nuclear Accident (1986), the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986), the Convention on the Physical Protection of Nuclear Material (1980), the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter as amended (1994) and other relevant international instruments;

(xiv) Keeping in mind the principles contained in the interagency "International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources" (1996), in the IAEA Safety Fundamentals entitled "The Principles of Radioactive Waste Management" (1995), and in the existing international standards relating to the safety of the transport of radioactive materials;

(xv) Recalling Chapter 22 of Agenda 21 by the United Nations Conference on Environment and Development in Rio de Janeiro adopted in 1992, which reaffirms the paramount importance of the safe and environmentally sound management of radioactive waste;

(xvi) Recognizing the desirability of strengthening the international control system applying specifically to radioactive materials as referred to in Article 1(3) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989);

Have agreed as follows:

CHAPTER 1. OBJECTIVES, DEFINITIONS AND SCOPE OF APPLICATION

ARTICLE 1. OBJECTIVES

The objectives of this Convention are:

(i) to achieve and maintain a high level of safety worldwide in spent fuel and radioactive waste management, through the enhancement of national measures and international co-operation, including where appropriate, safety-related technical co-operation;

(ii) to ensure that during all stages of spent fuel and radioactive waste management there are effective defenses against potential hazards so that individuals, society and the environment are protected from harmful effects of ionizing radiation, now and in the future, in such a way that the needs and aspirations of the present generation are met without compromising the ability of future generations to meet their needs and aspirations;

(iii) to prevent accidents with radiological consequences and to mitigate their consequences should they occur during any stage of spent fuel or radioactive waste management.

ARTICLE 2. DEFINITIONS

For the purposes of this Convention:

(a) *"closure"* means the completion of all operations at some time after the emplacement of spent fuel or radioactive waste in a disposal facility. This includes the final engineering or other work required to bring the facility to a condition that will be safe in the long term;

(b) *"decommissioning"* means all steps leading to the release of a nuclear facility, other than a disposal facility, from regulatory control. These steps include the processes of decontamination and dismantling;

(c) *"discharges"* means planned and controlled releases into the environment, as a legitimate practice, within limits authorized by the regulatory body, of liquid or gaseous radioactive materials that originate from regulated nuclear facilities during normal operation;

(d) *"disposal"* means the emplacement of spent fuel or radioactive waste in an appropriate facility without the intention of retrieval;

(e) *"licence"* means any authorization, permission or certification granted by a regulatory body to carry out any activity related to management of spent fuel or of radioactive waste;

(f) *"nuclear facility"* means a civilian facility and its associated land, buildings and equipment in which radioactive materials are produced, processed, used, handled, stored or disposed of on such a scale that consideration of safety is required;

(g) *"operating lifetime"* means the period during which a spent fuel or a radioactive waste management facility is used for its intended purpose. In the case of a disposal facility, the period begins when spent fuel or radioactive waste is first emplaced in the facility and ends upon closure of the facility;

(h) *"radioactive waste"* means radioactive material in gaseous, liquid or solid form for which no further use is foreseen by the Contracting Party or by a natural or legal person whose decision is accepted by the Contracting Party, and which is controlled as radioactive waste by a regulatory body under the legislative and regulatory framework of the Contracting Party;

(i) *"radioactive waste management"* means all activities, including decommissioning activities, that relate to the handling, pretreatment, treatment, conditioning, storage, or disposal of

radioactive waste, excluding off-site transportation. It may also involve discharges;

(j) *"radioactive waste management facility"* means any facility or installation the primary purpose of which is radioactive waste management, including a nuclear facility in the process of being decommissioned only if it is designated by the Contracting Party as a radioactive waste management facility;

(k) *"regulatory body"* means any body or bodies given the legal authority by the Contracting Party to regulate any aspect of the safety of spent fuel or radioactive waste management including the granting of licences;

(l) *"reprocessing"* means a process or operation, the purpose of which is to extract radioactive isotopes from spent fuel for further use;

(m) *"sealed source"* means radioactive material that is permanently sealed in a capsule or closely bonded and in a solid form, excluding reactor fuel elements;

(n) *"spent fuel"* means nuclear fuel that has been irradiated in and permanently removed from a reactor core;

(o) *"spent fuel management"* means all activities that relate to the handling or storage of spent fuel, excluding off-site transportation. It may also involve discharges;

(p) *"spent fuel management facility"* means any facility or installation the primary purpose of which is spent fuel management;

(q) *"State of destination"* means a State to which a transboundary movement is planned or takes place;

(r) *"State of origin"* means a State from which a transboundary movement is planned to be initiated or is initiated;

(s) *"State of transit"* means any State, other than a State of origin or a State of destination, through whose territory a transboundary movement is planned or takes place;

(t) *"storage"* means the holding of spent fuel or of radioactive waste in a facility that provides for its containment, with the intention of retrieval;

(u) *"transboundary movement"* means any shipment of spent fuel or of radioactive waste from a State of origin to a State of destination.

ARTICLE 3. SCOPE OF APPLICATION

1. This Convention shall apply to the safety of spent fuel management when the spent fuel results from the operation of civilian nuclear reactors. Spent fuel held at reprocessing facilities as part of a reprocessing activity is not covered in the scope of this Convention unless the Contracting Party declares reprocessing to be part of spent fuel management.

2. This Convention shall also apply to the safety of radioactive waste management when the radioactive waste results from civilian applications. However, this Convention shall not apply to waste that contains only naturally occurring radioactive materials and that does not originate from the nuclear fuel cycle, unless it constitutes a disused sealed source or it is declared as radioactive waste for the purposes of this Convention by the Contracting Party.

3. This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military or defence programmes, unless declared as spent fuel or radioactive waste for the purposes of this Convention by the Contracting Party. However, this Convention shall apply to the safety of management of spent fuel and radioactive waste from military or defence programmes if and when such materials are transferred permanently to and managed within exclusively civilian programmes.

4. This Convention shall also apply to discharges as provided for in Articles 4, 7, 11, 14, 24 and 26.

CHAPTER 2 SAFETY OF SPENT FUEL MANAGEMENT

ARTICLE 4. GENERAL SAFETY REQUIREMENTS

Each Contracting Party shall take the appropriate steps to ensure that at all stages of spent fuel management, individuals, society and the environment are adequately protected against radiological hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during spent fuel management are adequately addressed;

(ii) ensure that the generation of radioactive waste associated with spent fuel management is kept to the minimum practicable, consistent with the type of fuel cycle policy adopted;

(iii) take into account interdependencies among the different steps in spent fuel management;

(iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

(v) take into account the biological, chemical and other hazards that may be associated with spent fuel management;

(vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

(vii) aim to avoid imposing undue burdens on future generations.

ARTICLE 5. EXISTING FACILITIES

Each Contracting Party shall take the appropriate steps to review the safety of any spent fuel management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility.

ARTICLE 6. SITING OF PROPOSED FACILITIES

1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed spent fuel management facility:

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment;

(iii) to make information on the safety of such a facility available to members of the public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

2. In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 4.

ARTICLE 7. DESIGN AND CONSTRUCTION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the design and construction of a spent fuel management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a spent fuel management facility are taken into account;

(iii) the technologies incorporated in the design and construction of a spent fuel management facility are supported by experience, testing or analysis.

ARTICLE 8. ASSESSMENT OF SAFETY OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) before construction of a spent fuel management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

(ii) before the operation of a spent fuel management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

ARTICLE 9. OPERATION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the licence to operate a spent fuel management facility is based upon appropriate assessments as specified in Article 8 and is conditional on the completion of a commissioning programme

demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions derived from tests, operational experience and the assessments, as specified in Article 8, are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a spent fuel management facility are conducted in accordance with established procedures;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a spent fuel management facility;

(v) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vi) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(vii) decommissioning plans for a spent fuel management facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body.

ARTICLE 10. DISPOSAL OF SPENT FUEL

If, pursuant to its own legislative and regulatory framework, a Contracting Party has designated spent fuel for disposal, the disposal of such spent fuel shall be in accordance with the obligations of Chapter 3 relating to the disposal of radioactive waste.

CHAPTER 3 SAFETY OF RADIOACTIVE WASTE MANAGEMENT

ARTICLE 11. GENERAL SAFETY REQUIREMENTS

Each Contracting Party shall take the appropriate steps to ensure that at all stages of radioactive waste management individuals, society and the environment are adequately protected against radiological and other hazards.

In so doing, each Contracting Party shall take the appropriate steps to:

(i) ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed;

(ii) ensure that the generation of radioactive waste is kept to the minimum practicable;

(iii) take into account interdependencies among the different steps in radioactive waste management;

(iv) provide for effective protection of individuals, society and the environment, by applying at the national level suitable protective methods as approved by the regulatory body, in the framework of its national legislation which has due regard to internationally endorsed criteria and standards;

(v) take into account the biological, chemical and other hazards that may be associated with radioactive waste management;

(vi) strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation;

(vii) aim to avoid imposing undue burdens on future generations.

ARTICLE 12. EXISTING FACILITIES AND PAST PRACTICES

Each Contracting Party shall in due course take the appropriate steps to review:

(i) the safety of any radioactive waste management facility existing at the time the Convention enters into force for that Contracting Party and to ensure that, if necessary, all reasonably practicable improvements are made to upgrade the safety of such a facility;

(ii) the results of past practices in order to determine whether any intervention is needed for reasons of radiation protection bearing in mind that the reduction in detriment resulting from the reduction in dose should be sufficient to justify the harm and the costs, including the social costs, of the intervention.

ARTICLE 13. SITING OF PROPOSED FACILITIES

1. Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility:

(i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure;

(ii) to evaluate the likely safety impact of such a facility on individuals, society and the environment, taking into account possible evolution of the site conditions of disposal facilities after closure;

(iii) to make information on the safety of such a facility available to members of the public;

(iv) to consult Contracting Parties in the vicinity of such a facility, insofar as they are likely to be affected by that facility, and provide them, upon their request, with

general data relating to the facility to enable them to evaluate the likely safety impact of the facility upon their territory.

2. In so doing, each Contracting Party shall take the appropriate steps to ensure that such facilities shall not have unacceptable effects on other Contracting Parties by being sited in accordance with the general safety requirements of Article 11.

ARTICLE 14. DESIGN AND CONSTRUCTION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the design and construction of a radioactive waste management facility provide for suitable measures to limit possible radiological impacts on individuals, society and the environment, including those from discharges or uncontrolled releases;

(ii) at the design stage, conceptual plans and, as necessary, technical provisions for the decommissioning of a radioactive waste management facility other than a disposal facility are taken into account;

(iii) at the design stage, technical provisions for the closure of a disposal facility are prepared;

(iv) the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

ARTICLE 15. ASSESSMENT OF SAFETY OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) before construction of a radioactive waste management facility, a systematic safety assessment and an environmental assessment appropriate to the hazard presented by the facility and covering its operating lifetime shall be carried out;

(ii) in addition, before construction of a disposal facility, a systematic safety assessment and an environmental assessment for the period following closure shall be carried out and the results evaluated against the criteria established by the regulatory body;

(iii) before the operation of a radioactive waste management facility, updated and detailed versions of the safety assessment and of the environmental assessment shall be prepared when deemed necessary to complement the assessments referred to in paragraph (i).

ARTICLE 16. OPERATION OF FACILITIES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) the licence to operate a radioactive waste management facility is based upon appropriate assessments as specified in Article 15 and is conditional on the completion of a commissioning programme demonstrating that the facility, as constructed, is consistent with design and safety requirements;

(ii) operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary;

(iii) operation, maintenance, monitoring, inspection and testing of a radioactive waste management facility are conducted in accordance with established procedures. For a disposal facility the results thus obtained shall be used to verify and to review the validity of assumptions made and to update the assessments as specified in Article 15 for the period after closure;

(iv) engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility;

(v) procedures for characterization and segregation of radioactive waste are applied;

(vi) incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body;

(vii) programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate;

(viii) decommissioning plans for a radioactive waste management facility other than a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility, and are reviewed by the regulatory body;

(ix) plans for the closure of a disposal facility are prepared and updated, as necessary, using information obtained during the operating lifetime of that facility and are reviewed by the regulatory body.

ARTICLE 17. INSTITUTIONAL MEASURES AFTER CLOSURE

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility:

(i) records of the location, design and inventory of that facility required by the regulatory body are preserved;

(ii) active or passive institutional controls such as monitoring or access restrictions are carried out, if required; and

(iii) if, during any period of active institutional control, an unplanned release of radioactive materials into the environment is detected, intervention measures are implemented, if necessary.

CHAPTER 4 GENERAL SAFETY PROVISIONS

ARTICLE 18. IMPLEMENTING MEASURES

Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention.

ARTICLE 19. LEGISLATIVE AND REGULATORY FRAMEWORK

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of spent fuel and radioactive waste management.

2. This legislative and regulatory framework shall provide for:

(i) the establishment of applicable national safety requirements and regulations for radiation safety;

(ii) a system of licensing of spent fuel and radioactive waste management activities;

(iii) a system of prohibition of the operation of a spent fuel or radioactive waste management facility without a licence;

(iv) a system of appropriate institutional control, regulatory inspection and documentation and reporting;

(v) the enforcement of applicable regulations and of the terms of the licences;

(vi) a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.

3. When considering whether to regulate radioactive materials as radioactive waste, Contracting Parties shall take due account of the objectives of this Convention.

ARTICLE 20. 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 19, and provided with adequate authority, competence and financial and human resources to fulfill its assigned responsibilities.

2. Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation.

ARTICLE 21. RESPONSIBILITY OF THE LICENCE HOLDER

1. Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility.

2. If there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste.

ARTICLE 22. HUMAN AND FINANCIAL RESOURCES

Each Contracting Party shall take the appropriate steps to ensure that:

(i) qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility;

(ii) adequate financial resources are available to support the safety of facilities for spent fuel and radioactive waste management during their operating lifetime and for decommissioning;

(iii) financial provision is made which will enable the appropriate institutional controls and monitoring arrangements to be continued for the period deemed necessary following the closure of a disposal facility.

ARTICLE 23. QUALITY ASSURANCE

Each Contracting Party shall take the necessary steps to ensure that appropriate quality assurance programmes concerning the safety of spent fuel and radioactive waste management are established and implemented.

ARTICLE 24. OPERATIONAL RADIATION PROTECTION

1. Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility:

(i) the radiation exposure of the workers and the public caused by the facility shall be kept as low as reasonably achievable, economic and social factors being taken into account;

(ii) no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection; and

(iii) measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

2. Each Contracting Party shall take appropriate steps to ensure that discharges shall be limited:

(i) to keep exposure to radiation as low as reasonably achievable, economic and social factors being taken into account; and

(ii) so that no individual shall be exposed, in normal situations, to radiation doses which exceed national prescriptions for dose limitation which have due regard to internationally endorsed standards on radiation protection.

3. Each Contracting Party shall take appropriate steps to ensure that during the operating lifetime of a regulated nuclear facility, in the event that an unplanned or uncontrolled release of radioactive materials into the environment occurs, appropriate corrective measures are implemented to control the release and mitigate its effects.

ARTICLE 25. EMERGENCY PREPAREDNESS

1. Each Contracting Party shall ensure that before and during operation of a spent fuel or radioactive waste management facility there are appropriate on-site and, if necessary, off-site emergency plans. Such emergency plans should be tested at an appropriate frequency.

2. Each Contracting Party shall take the appropriate steps for the preparation and testing of emergency plans for its territory insofar as it is likely to be affected in the event of a radiological emergency at a spent fuel or radioactive waste management facility in the vicinity of its territory.

ARTICLE 26. DECOMMISSIONING

Each Contracting Party shall take the appropriate steps to ensure the safety of decommissioning of a nuclear facility. Such steps shall ensure that:

(i) qualified staff and adequate financial resources are available;

(ii) the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied;

(iii) the provisions of Article 25 with respect to emergency preparedness are applied; and

(iv) records of information important to decommissioning are kept.

CHAPTER 5 MISCELLANEOUS PROVISIONS

ARTICLE 27. TRANSBOUNDARY MOVEMENT

1. Each Contracting Party involved in transboundary movement shall take the appropriate steps to ensure that such movement is undertaken in a manner consistent with the provisions of this Convention and relevant binding international instruments.

In so doing:

(i) a Contracting Party which is a State of origin shall take the appropriate steps to ensure that transboundary movement is authorized and takes place only with the prior notification and consent of the State of destination;

(ii) transboundary movement through States of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized;

(iii) a Contracting Party which is a State of destination shall consent to a transboundary movement only if it has the administrative and technical capacity, as well as the regulatory structure, needed to manage the spent fuel or the radioactive waste in a manner consistent with this Convention;

(iv) a Contracting Party which is a State of origin shall authorize a transboundary movement only if it can satisfy itself in accordance with the consent of the State of destination that the requirements of subparagraph (iii) are met prior to transboundary movement;

(v) a Contracting Party which is a State of origin shall take the appropriate steps to permit re-entry into its territory, if a transboundary movement is not or cannot be completed in conformity with this Article, unless an alternative safe arrangement can be made.

2. A Contracting Party shall not licence the shipment of its spent fuel or radioactive waste to a destination south of latitude 60 degrees South for storage or disposal.

3. Nothing in this Convention prejudices or affects:

(i) the exercise, by ships and aircraft of all States, of maritime, river and air navigation rights and freedoms, as provided for in international law;

(ii) rights of a Contracting Party to which radioactive waste is exported for processing to return, or provide for the return of, the radioactive waste and other products after treatment to the State of origin;

(iii) the right of a Contracting Party to export its spent fuel for reprocessing;

(iv) rights of a Contracting Party to which spent fuel is exported for reprocessing to return, or provide for the return of, radioactive waste and other products resulting from reprocessing operations to the State of origin.

ARTICLE 28. DISUSED SEALED SOURCES

1. Each Contracting Party shall, in the framework of its national law, take the appropriate steps to ensure that the possession, remanufacturing or disposal of disused sealed sources takes place in a safe manner.

2. A Contracting Party shall allow for reentry into its territory of disused sealed sources if, in the framework of its national law, it has accepted that they be returned to a manufacturer qualified to receive and possess the disused sealed sources.

CHAPTER 6 MEETINGS OF THE CONTRACTING PARTIES

ARTICLE 29. PREPARATORY MEETING

1. A preparatory meeting of the Contracting Parties shall be held not later than six months after the date of entry into force of this Convention.

2. At this meeting, the Contracting Parties shall:

(i) determine the date for the first review meeting as referred to in Article 30. This review meeting shall be held as soon as possible, but not later than thirty months after the date of entry into force of this Convention;

(ii) prepare and adopt by consensus Rules of Procedure and Financial Rules;

(iii) establish in particular and in accordance with the Rules of Procedure:

(a) guidelines regarding the form and structure of the national reports to be submitted pursuant to Article 32;

(b) a date for the submission of such reports;

(c) the process for reviewing such reports.

3. Any State or regional organization of an integration or other nature which ratifies, accepts, approves, accedes to or confirms this Convention and for which the Convention is not yet in force, may attend the preparatory meeting as if it were a Party to this Convention.

ARTICLE 30. REVIEW MEETINGS

1. The Contracting Parties shall hold meetings for the purpose of reviewing the reports submitted pursuant to Article 32.

2. At each review meeting the Contracting Parties:

(i) shall determine the date for the next such meeting, the interval between review meetings not exceeding three years;

(ii) may review the arrangements established pursuant to paragraph 2 of Article 29, and adopt revisions by consensus unless otherwise provided for in the Rules of Procedure. They may also amend the Rules of Procedure and Financial Rules by consensus.

3. At each review meeting each Contracting Party shall have a reasonable opportunity to discuss the reports submitted by other Contracting Parties and to seek clarification of such reports.

ARTICLE 31. EXTRAORDINARY MEETINGS

An extraordinary meeting of the Contracting Parties shall be held:

(i) if so agreed by a majority of the Contracting Parties present and voting at a meeting; or

(ii) at the written request of a Contracting Party, within six months of this request having been communicated to the Contracting Parties and notification having been received by the secretariat referred to in Article 37 that the request has been supported by a majority of the Contracting Parties.

ARTICLE 32. REPORTING

1. In accordance with the provisions of Article 30, each Contracting Party shall submit a national report to each review meeting of Contracting Parties. This report shall address the measures taken to implement each of the obligations of the Convention. For each Contracting Party the report shall also address its:

(i) spent fuel management policy;
(ii) spent fuel management practices;
(iii) radioactive waste management policy;
(iv) radioactive waste management practices;
(v) criteria used to define and categorize radioactive waste.

2. This report shall also include:

(i) a list of the spent fuel management facilities subject to this Convention, their location, main purpose and essential features;

(ii) an inventory of spent fuel that is subject to this Convention and that is being held in storage and of that which has been disposed of. This inventory shall contain a description of the material and, if available, give information on its mass and its total activity;

(iii) a list of the radioactive waste management facilities subject to this Convention, their location, main purpose and essential features;

(iv) an inventory of radioactive waste that is subject to this Convention that:

(a) is being held in storage at radioactive waste management and nuclear fuel cycle facilities;
(b) has been disposed of; or
(c) has resulted from past practices.

This inventory shall contain a description of the material and other appropriate information available, such as volume or mass, activity and specific radionuclides;

(v) a list of nuclear facilities in the process of being decommissioned and the status of decommissioning activities at those facilities.

ARTICLE 33. ATTENDANCE

1. Each Contracting Party shall attend meetings of the Contracting Parties and be represented at such meetings by one delegate, and by such alternates, experts and advisers as it deems necessary.

2. The Contracting Parties may invite, by consensus, any intergovernmental organization which is competent in respect of matters governed by this Convention to attend, as an observer, any meeting, or specific sessions thereof. Observers shall be required to accept in writing, and in advance, the provisions of Article 36.

ARTICLE 34. SUMMARY REPORTS

The Contracting Parties shall adopt, by consensus, and make available to the public a document addressing issues discussed and conclusions reached during meetings of the Contracting Parties.

ARTICLE 35. LANGUAGES

1. The languages of meetings of the Contracting Parties shall be Arabic, Chinese, English, French, Russian and Spanish unless otherwise provided in the Rules of Procedure.

2. Reports submitted pursuant to Article 32 shall be prepared in the national language of the submitting Contracting Party or in a single designated language to be agreed in the Rules of Procedure. Should the report be submitted in a national language other than the designated language, a translation of the report into the designated language shall be provided by the Contracting Party.

3. Notwithstanding the provisions of paragraph 2, the secretariat, if compensated, will assume the translation of reports submitted in any other language of the meeting into the designated language.

ARTICLE 36. CONFIDENTIALITY

1. The provisions of this Convention shall not affect the rights and obligations of the Contracting Parties under their laws to protect information from disclosure. For the purposes of this article, "information" includes, inter alia, information relating to national security or to the physical protection of nuclear materials, information protected by intellectual property rights or by industrial or commercial confidentiality, and personal data.

2. When, in the context of this Convention, a Contracting Party provides information identified by it as protected as described in paragraph 1, such information shall be used only for the purposes for which it has been provided and its confidentiality shall be respected.

3. With respect to information relating to spent fuel or radioactive waste falling within the scope of this Convention by virtue of paragraph 3 of Article 3, the provisions of this Convention shall not affect the exclusive discretion of the Contracting Party concerned to decide:

(i) whether such information is classified or otherwise controlled to preclude release;

(ii) whether to provide information referred to in sub-paragraph (i) above in the context of the Convention; and

(iii) what conditions of confidentiality are attached to such information if it is provided in the context of this Convention.

4. The content of the debates during the reviewing of the national reports at each review meeting held pursuant to Article 30 shall be confidential.

ARTICLE 37. SECRETARIAT

1. The International Atomic Energy Agency, (hereinafter referred to as "the Agency") shall provide the secretariat for the meetings of the Contracting Parties.

2. The secretariat shall:

(i) convene, prepare and service the meetings of the Contracting Parties referred to in Articles 29, 30 and 31;

(ii) transmit to the Contracting Parties information received or prepared in accordance with the provisions of this Convention.

The costs incurred by the Agency in carrying out the functions referred to in sub-paragraphs (i) and (ii) above shall be borne by the Agency as part of its regular budget.

3. The Contracting Parties may, by consensus, request the Agency to provide other services in support of meetings of the Contracting Parties. The Agency may provide such services if they can be undertaken within its programme and regular budget. Should this not be possible, the Agency may provide such services if voluntary funding is provided from another source.

CHAPTER 7. FINAL CLAUSES AND OTHER PROVISIONS

ARTICLE 38. RESOLUTION OF DISAGREEMENTS

In the event of a disagreement between two or more Contracting Parties concerning the interpretation or application of this Convention, the Contracting Parties shall consult within the framework of a meeting of the Contracting Parties with a view to resolving the disagreement. In the event that the consultations prove unproductive, recourse can be made to the mediation, conciliation and arbitration mechanisms provided for in international law, including the rules and practices prevailing within the IAEA.

ARTICLE 39. SIGNATURE, RATIFICATION, ACCEPTANCE, APPROVAL, ACCESSION

1. This Convention shall be open for signature by all States at the Headquarters of the Agency in Vienna from 29 September 1997 until its entry into force.

2. This Convention is subject to ratification, acceptance or approval by the signatory States.

3. After its entry into force, this Convention shall be open for accession by all States.

4. (i) This Convention shall be open for signature subject to confirmation, or accession by regional organizations of an integration or other nature, provided that any such organization is constituted by sovereign States and has competence in respect of the negotiation, conclusion and application of international agreements in matters covered by this Convention.

(ii) In matters within their competence, such organizations shall, on their own behalf, exercise the rights and fulfil the responsibilities which this Convention attributes to States Parties.

(iii) When becoming party to this Convention, such an organization shall communicate to the Depositary referred to in Article 43, a declaration indicating which States are members thereof, which Articles of this Convention apply to it, and the extent of its competence in the field covered by those articles.

(iv) Such an organization shall not hold any vote additional to those of its Member States.

5. Instruments of ratification, acceptance, approval, accession or confirmation shall be deposited with the Depositary.

ARTICLE 40. ENTRY INTO FORCE

1. This Convention shall enter into force on the ninetieth day after the date of deposit with the Depositary of the twenty-fifth instrument of ratification, acceptance or approval, including the instruments of fifteen States each having an operational nuclear power plant.

2. For each State or regional organization of an integration or other nature which ratifies, accepts, approves, accedes to or confirms this Convention after the date of deposit of the last instrument required to satisfy the conditions set forth in paragraph 1, this Convention shall enter into force on the ninetieth day after the date of deposit with the Depositary of the appropriate instrument by such a State or organization.

ARTICLE 41. AMENDMENTS TO THE CONVENTION

1. Any Contracting Party may propose an amendment to this Convention. Proposed amendments shall be considered at a review meeting or at an extraordinary meeting.

2. The text of any proposed amendment and the reasons for it shall be provided to the Depositary who shall communicate the proposal to the Contracting Parties at least ninety days before the meeting for which it is submitted for consideration. Any comments received on such a proposal shall be circulated by the Depositary to the Contracting Parties.

3. The Contracting Parties shall decide after consideration of the proposed amendment whether to adopt it by consensus, or, in the absence of consensus, to submit it to a Diplomatic Conference. A decision to submit a proposed amendment to a Diplomatic Conference shall require a two-thirds majority vote of the Contracting Parties present and voting at the meeting, provided that at least one half of the Contracting Parties are present at the time of voting.

4. The Diplomatic Conference to consider and adopt amendments to this Convention shall be convened by the Depositary and held no later than one year after the appropriate decision taken in accordance with paragraph 3 of this article. The Diplomatic Conference shall make every effort to

ensure amendments are adopted by consensus. Should this not be possible, amendments shall be adopted with a two-thirds majority of all Contracting Parties.

5. Amendments to this Convention adopted pursuant to paragraphs 3 and 4 above shall be subject to ratification, acceptance, approval, or confirmation by the Contracting Parties and shall enter into force for those Contracting Parties which have ratified, accepted, approved or confirmed them on the ninetieth day after the receipt by the Depositary of the relevant instruments of at least two thirds of the Contracting Parties. For a Contracting Party which subsequently ratifies, accepts, approves or confirms the said amendments, the amendments will enter into force on the ninetieth day after that Contracting Party has deposited its relevant instrument.

ARTICLE 42. DENUNCIATION

1. Any Contracting Party may denounce this Convention by written notification to the Depositary.

2. Denunciation shall take effect one year following the date of the receipt of the notification by the Depositary, or on such later date as may be specified in the notification.

ARTICLE 43. DEPOSITARY

1. The Director General of the Agency shall be the Depositary of this Convention.

2. The Depositary shall inform the Contracting Parties of:

(i) the signature of this Convention and of the deposit of instruments of ratification, acceptance, approval, accession or confirmation in accordance with Article 39;

(ii) the date on which the Convention enters into force, in accordance with Article 40;

(iii) the notifications of denunciation of the Convention and the date thereof, made in accordance with Article 42;

(iv) the proposed amendments to this Convention submitted by Contracting Parties, the amendments adopted by the relevant Diplomatic Conference or by the meeting of the Contracting Parties, and the date of entry into force of the said amendments, in accordance with Article 41.

ARTICLE 44. AUTHENTIC TEXTS

The original of this Convention of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Depositary, who shall send certified copies thereof to the Contracting Parties.

IN WITNESS WHEREOF THE UNDERSIGNED, BEING DULY AUTHORIZED TO THAT EFFECT, HAVE SIGNED THIS CONVENTION.

Done at Vienna on the fifth day of September, one thousand nine hundred and ninety-seven.

StrålevernRapport 2003:1
Virksomhetsplan for 2003

StrålevernRapport 2003:2
Utslipp av radioaktive stoffer fra Sellafield-anleggene
En gjennomgang av britiske myndigheters
regulering av utslippstillatelser

StrålevernRapport 2003:3
MOX, En del av kjernebrenselsyklusen

StrålevernRapport 2003:4
LORAKON
Resultater fra Ringtest i 2000 og 2001

StrålevernRapport 2003:5
Monitoring of ^{99}Tc in the Norwegian Arctic marine environment

StrålevernRapport 2003:6
Treårig tilstandsrapport for konsesjonsbelagte anlegg ved Institutt for energiteknikk

StrålevernRapport 2003:7
Environmental impact assessments for the marine environment
– transfer and uptake of radionuclides

StrålevernRapport 2003:8
Radioactivity in the Marine Environment 2000 and 2001
Results from the Norwegian National Monitoring Programme (RAME)

StrålevernRapport 2003:9
Kartlegging av radon i 44 kommuner 2003
Kort presentasjon av resultatene

StrålevernRapport 2003:10
Virksomhetsrapportering i stråleterapi
Definisjoner og beskrivelser 2001/2002

StrålevernRapport 2003:11
Dosimetry in Norwegian radiotherapy
Implementation of the absorbed dose to water standard and code of practice in radiotherapy in Norway

StrålevernRapport 2003:12
Volum og doser ved strålebehandling
Definisjoner, retningslinjer for bruk, dokumentasjon og rapportering

StrålevernRapport 2003:13
Årsrapport fra Statens stråleverns persondosimetritjeneste 2002

StrålevernRapport 2003:14
Kvalitetskontroll i mammografi. Konstanskontroller

ISSN 0804-4910