SECOND NATIONAL REPORT OF AUSTRIA

On the Implementation of the Obligations of the

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

October 2005

Executive Summary

In Austria there is neither a nuclear power plant (NPP) nor any other fuel cycle facility in operation. One NPP was constructed in Zwentendorf in the 1970s, but, as a consequence of the negative vote in a referendum never put into operation. Two out of three research reactors in Austria have been shut down (ASTRA Seibersdorf in 2000, SIEMENS Argonaut Graz in 2004) and are currently under decommissioning. The remaining TRIGA research reactor in Vienna is still in operation. Spent nuclear fuel is stored on site in wet or dry storage facilities. All spent fuel has been and will be returned to the USA.

Austria operates one central radioactive waste management and interim storage facility – Nuclear Engineering Seibersdorf GmbH (NES) for pre-disposal management including treatment, conditioning and interim storage of low- and intermediate level radioactive waste (LILW). High-level radioactive waste (HLW) does not arise in Austria. The small quantities of LILW in Austria (originating primarily from medicine, research and industry and decommissioning) are brought to NES; short-lived radioactive waste is kept in interim storage at the producers. There is no final repository for disposal of radioactive waste currently in operation. Up to now no decision has been taken about a geological disposal or a near-surface long-term storage. Austria favours an international or regional cooperation in radioactive waste management.

NEW: The biological shield of the former ASTRA reactor in Seibersdorf has been completely dismantled. Beginning in 2006 all remaining contaminations will be removed and the building will be cleared for the use of interim storage facility for conditioned radioactive waste. The Joint Agreement between the Austrian State, the Community of Seibersdorf and Nuclear Engineering Seibersdorf GmbH (NES), based on the Radiation Protection Act was amended in 2003 and extended the interim storage period of the LILW in Nuclear Engineering Seibersdorf to 2030. In order to allow for a visual control of every single drum, the current storage capacities have decreased. The conversion of the reactor building will give sufficient room to store all conditioned and if necessary re-conditioned LILW in NES. In case a defect drum is detected it can be withdrawn from the storage and reconditioning can be carried out.

NEW: The revised Radiation Protection Act has come into force in Austria on 1 January 2005 implementing recent EU-legislation. The new Radiation Protection Act clearly requires from each licensee to present a decommissioning plan including closure and radioactive waste management scheme as a prerequisite for receiving a construction and/or operating license.

NEW: The entirely new General Radiation Protection Ordinance will enter into force on 1 January 2006. Complemented by the Medical Radiation Protection Ordinance (2004) it will replace the Radiation Protection Ordinance (1972). The previous clearance limit of 10 µCi/m^3 has been replaced in the new General Radiation Protection Ordinance by nuclide specific values derived from the internationally accepted ‘10 µSv/year additional dose concept.

Conclusion: After considering in detail the requirements laid down in the Joint Convention on the Safety of Spent Fuel and on the Safety of Radioactive Waste Management, the present report concludes that the safety of radioactive waste management in Austria is in line with the obligations of the Convention. However, further strengthening of the regulatory system is intended, the roles and responsibilities of the competent licensing and regulatory authorities need to be revised. A solution for the long-term management of radioactive waste is currently being developed

Section A Introduction

A.1 Main Safety Issues

This report addresses in particular safety issues which have been identified in the previous report or which have arisen since the completion of the previous report. Responding to questions received and raised at country group sessions of the previous Review Meeting, the Second Austrian National Report will particularly deal with

- the division of responsibilities between different regulatory bodies (see Sections E.2 and E.3)
- the plans to transform the ASTRA Research Reactor building to an interim waste storage facility ("transfer store") (for a detailed description see Annex L.3) and
- the Austrian strategy for long term management of Low and intermediate level waste (LILW) (see Section B.3 and Annex L.4).

A.2 Main themes of the report

The Second Austrian National Report contains updated information on the Austrian policy and the usual practices concerning the management of spent fuel of the Austrian research reactors and the management of radioactive waste (see Section B). Furthermore it contains information on the Austrian legal regime concerning the management of radioactive waste (see Section E), noting significant changes in national waste management policies, applicable national, laws, regulations and practices. The Report has been completely restructured to better follow the structure of the Convention. It has been supplemented in line with the Guidelines with comprehensive information on the licensing system (see Section E.2), transboundary movements (see Section I) and disused sealed sources (see Section J).

Section B Policies and Practices – Article 32 Paragraph 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 measure 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 to define and categorize radioactive waste.***

B.1 Spent fuel management policy – Article 32 Para 1 (i)

In the 1970s, a nuclear power plant was constructed in Zwentendorf, but as a consequence of the negative vote in a referendum it was never operated. All nuclear fuel elements were removed in the late 1980s. Thus, Austria has never operated a nuclear power plant and has no intention to do so in the future. Austria's use of nuclear energy for peaceful purposes has been significantly influenced by the passing of the law prohibiting the use of nuclear fission for energy purposes in 1978 and by passing the Constitutional Law on a Non-Nuclear Austria[i] in 1999.

Currently, Austria operates only one research reactor at the Atomic Institute of the Austrian Universities situated in Vienna. Two other research reactors have been shut down in 2001 and 2004. All spent fuel from research reactors has been returned to the United States Department of Energy. For reshipment of spent fuel from the remaining TRIGA research reactor

Austria has valid contracts in place. This means that Austria will not have to deal with spent fuel management. Austria therefore has no obligations as regards the interim storage of a greater amount of spent fuel or for the final disposal of spent fuel.

B.2 Spent fuel management practices – Article 32 Para 1 (ii)

Since March 1962 the Atomic Institute of the Austrian Universities operates a TRIGA Mark II research reactor in Vienna for basic and applied academic research and teaching purposes. Spent fuel from the research reactors is stored on site until the return shipment to the United States. The dry interim storage with a capacity of 168 fuel elements is situated in the reactor building. At present there are 8 spent fuel elements stored on site.

Storage of spent fuel follows applicable radiation protection and safeguards legislation. An appropriate license is needed for the storage and annual inspections are performed by the licensing authority. Shipment follows applicable transport and safeguards legislation.

All spent fuel (SF) of the Austrian Research Reactors currently under decommissioning has been returned to the United States in 2001 (ASTRA Reactor of Austrian Research Centers Seibersdorf) and in autumn 2005 (SIEMENS ARGONAUT Reactor of the University Graz). The SF produced by the last remaining research reactor of the Atomic Institute of the Austrian Universities is covered by a framework contract for „US-origin nuclear fuel“ and will be returned to the United States.

B.3 Radioactive waste management policy – Article 32 Para 1 (iii)

The Austrian Federal Constitutional Law on Nuclear Free Austria[1] prohibits any kind of handling of nuclear weapons and related facilities (§1) as well as the construction and use of facilities for production of energy by nuclear fission (§2) on the Austrian territory.

In line with Austria's attitude towards nuclear power no facilities for spent nuclear fuel and high-level radioactive waste management should be operated in Austria.

Since 2003 Austria's radioactive waste management policy follows the 'polluter pays' principle. Producers of radioactive waste are legally responsible for the safe management and disposal of the waste they generate. They have to bear the costs of treatment, interim storage and in addition contribute to a special, separated fund, which exclusively dedicated for the later final disposal and administered by Austrian national authorities. This final disposal fee ("Vorsorgeentgelt") comprises costs for the later transfer to a final repository, for a possible additional treatment required by the final repository waste acceptance criteria, and for long term stewardship of the final repository. This fee is estimated based on fees assessed by several existing repositories abroad. Should the funds at a later time despite of due state-of-the-art estimation prove insufficient to cover the actual costs of final disposal, the Austrian state will provide the difference. Compared to countries producing nuclear power, only very small quantities of various categories of radioactive waste arise in Austria. However, all categories of radioactive waste have to be transported, treated, conditioned, and stored applying the same safety standards and techniques used for larger quantities of waste. Therefore the fixed costs of radioactive waste treatment are rather high in Austria. To keep the prices for treatment, conditioning and interim storage at an acceptable level the Austrian State provides for the technical infrastructure and state-of-the-art equipment of Nuclear Engineering Seibersdorf GmbH (NES).

Disused sealed sources should preferably be returned to the manufacturer.

Various studies on a national solution for final disposal of radioactive waste have revealed that the construction as well as the operation of a suitable final repository in Austria would require a minimum amount of LILW. Otherwise the economic implications would be unac-

[1] Federal Law Gazette I no. 149/1999.

ceptably high. Based on current knowledge the small quantities of radioactive waste produced by a country like Austria with no nuclear power plant neither economically nor ecologically justify national final disposal. As a consequence Austria regards international cooperation for the disposal of radioactive waste as the most reasonable solution. Austria is therefore very interested in common, shared repositories for radioactive waste.

Recent discussions within the European Union highlighted this problem and indicated that there is a common European responsibility. Consequently, Austria is convinced that this sense of responsibility would imply that states operating nuclear power plants cooperate closely with non nuclear power countries to develop solutions to their problem of final disposal of radioactive waste. In this context it should be noted that - at least from an Austrian point of view - nuclear power plants, especially those located in the vicinity of national borders, inflict high risks upon neighbouring counties, forcing them to establish and maintain costly off-site emergency preparedness procedures.

B.4 Radioactive waste management practices – Art. 32 Para 1 (iv)

Since no final repository is in operation, there are three radioactive waste management options in Austria:

- Transfer of segregated radioactive waste to a duly licensed interim storage facility or to a final repository.
- Decay of radioactive material according to an appropriate license and subsequent disposal as inactive waste. Radioactive decay waste with half-lives not exceeding 100 days can be stored by the producers until its activity has decayed below applicable clearance levels. Subsequently it can be released to the environment, to a waste disposal facility for non radioactive waste, or to a waste treatment facility for infectious waste.
- Discharge of gaseous or liquid radioactive material in line with the requirements of an appropriate license based on Article 74 of the General Radiation Protection Ordinance (2005).

Nuclear Engineering Seibersdorf GmbH (NES) is the only centralised waste management facility in Austria, where all conditioned low level and intermediate level radioactive waste (LILW) arising in Austria is currently interim stored. High level radioactive waste does not arise in Austria.

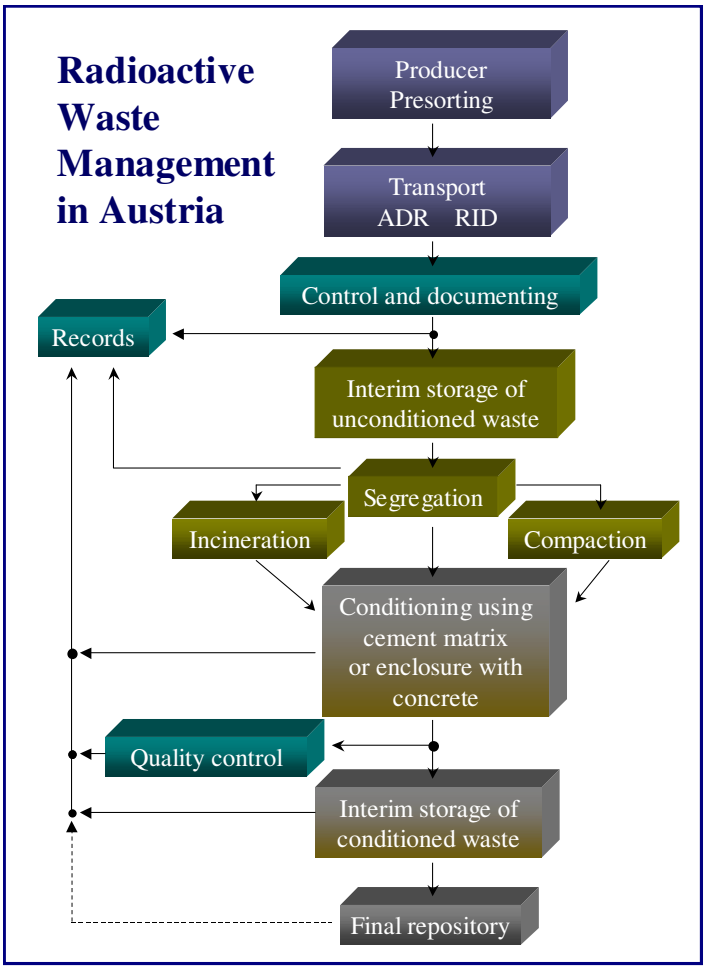
The aim of treatment and conditioning is to transform the radioactive waste into a chemically stable form and to isolate it safely from the environment. The volume reduction of the waste is also necessary to lower the future cost of interim and long term storage. At the same time procedures are established to effectively minimize and monitor the releases of radioactivity in accordance with applicable environmental regulations, i.e. HEPA filtration of gas effluents from the incinerator. A comprehensive program of environmental radiation monitoring is in place to ensure that any unexpected releases of radioactivity are detected and that the necessary actions can be taken in a timely manner.

A number of treatment and conditioning systems are operated by Nuclear Engineering Seibersdorf (see D.3 and Annex L.1).

Depending on the type of waste several treatment techniques are applied:

- Combustible waste is incinerated. The resulting incinerator ash has in the past been homogeneously cemented. However, since 1999, ash has been stored in 100-litre-drums pending the results of a study to identify a better conditioning method. The method chosen is placing the 100-litre-drums with ash in custom made stainless steel cartridges, purging the cartridges with nitrogen and welding them shut, and placing these in 200-litre-drums. Volume reduction: > 20:1.

- Non combustible compactable waste is supercompacted; the pellets are loaded into steel 200-litre-drums for interim storage, volume reduction: ~4:1.
- Non combustible non compactable waste is filled into steel 100-litre-drums placed into 200-litre-drums; the gap being cemented gives a volume reduction of ~ 1:2.
- Aqueous liquids are treated by precipitation and filtration, the resulting sludge is dried, the powder supercompacted, volume reduction: >30:1; non dryable sludge is cemented in 200-litre-drums.
- Filters are supercompacted; the pellets are loaded into 200-litre-drums for interim storage.
- Graphite blocks formerly used in the ASTRA research reactor core are stored in a Konrad Type II container.
- Higher-activity LILW originating from ASTRA research reactor decommissioning (near core construction material and in core experimental equipment) has been cut into smaller pieces and placed into appropriately shielded Mosaik and Konrad Type II containers.
- Radioactive sealed sources produced at Nuclear Engineering Seibersdorf GmbH (NES) and sold to different users are taken back after their useful life has elapsed or if there is no longer use for them; if still usable for other purposes they are stored at NES and, following tests and checks, may be reused. Before cementing for interim storage, spent sources are segregated according to their half life, i.e. ^{60}Co, ^{137}Cs, ^{241}Am.
- Radium sources are encapsulated by welding them into stainless steel capsules; they are retrievably stored in lead shielding. Other sources are collected in small steel containers and stored in shielded drums.
- High-activity sources can be handled in the hot cell facility and are stored in storage tubes in one of the hot cell boxes.



Radioactive waste management in Austria

All radioactive waste management facilities and activities in NES are duly licensed and regularly supervised by the Federal Ministry of Agriculture, Forestry, Environment and Water Management in accordance with the relevant Austrian radiation protection legislation (see Section E).

B.5 Categorization of Radioactive Waste – Article 32 Para 1 (v)

Radioactive waste is defined as radioactive material for which no further use is foreseen. Radioactive material means any substance that contains or is contaminated with one or more radionuclides with an activity or concentration that can not be disregarded, as far as radiation protection is concerned, and unless they are exempt from regulatory control. Exemption and clearance levels are laid down in the new Radiation Protection Ordinance which was put into force January 1st, 2006.

NEW: The previous clearance limit of 10 µCi/m^3 has been replaced in the new General Radiation Protection Ordinance by nuclide specific values derived from the internationally accepted '10 µSv/year additional dose' concept. Clearance measurements, manual or automatic, have to be certified directly or indirectly (via approved measurement protocol) by the competent authority.

NEW: Up to 2004 low level waste has been defined as having a dose rate of less than 100 µSv/h at a distance of 1 meter from the unshielded material. Material producing higher dose rates has been considered intermediate level waste.

Effective from 1st January 2004, Nuclear Engineering Seibersdorf GmbH (NES) adopted the Commission Recommendation of 15 September 1999 on a classification system for solid

radioactive waste 1999/669/EC, Euratom. This radioactive waste classification system is based on the IAEA classification scheme[2] and has been accepted by the regulatory body; it is not defined in the present legislation.

- Transition radioactive waste: Type of radioactive waste (mainly from medical origin) which will decay within the period of temporary storage and may then be suitable for management outside of the regulatory control system subject to compliance with clearance levels.
  Waste in the transition phase i.e. short-lived decay waste from medical applications containing ^{125}I is left to decay at the producers' sites, i.e., hospitals, or is brought to Seibersdorf for decay storage.
- Low and intermediate level waste (LILW): In LILW the concentration of radionuclides is such that generation of thermal power during its disposal is sufficiently low. These acceptable thermal power values are site-specific following safety assessments.
  - Short-lived waste (LILW-SL): This category includes radioactive waste with nuclides half-life less than or equal to those of ^{137}Cs and ^{90}Sr (around 30 years) with a restricted alpha long-lived radionuclide concentration (limitation of long-lived alpha emitting radio-nuclides to 4 000 Bq/g in individual waste packages and to an overall average of 400 Bq/g in the total waste volume).
  - Long-lived waste (LILW-LL): Long-lived radionuclides and alpha emitters whose concentration exceeds the limits for short-lived waste.
- High level waste (HLW): Waste with such a concentration of radionuclides that generation of thermal power shall be considered during its storage and disposal (The thermal power generation level is site-specific and this waste is mainly forthcoming from treatment/conditioning of sent nuclear fuel).

Material exhibiting activity concentrations below applicable clearance levels is measured in a state-of-the-art clearance monitor and free released as inactive waste. This currently applies, inter alia, to 80-100 t/year of decommissioning waste from the ASTRA research reactor in Seibersdorf as well as other decommissioning waste from the Seibersdorf site.

Section C Scope of Application – Article 3

C.1 Reprocessing – Article 3 Para 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.

Austria is neither operating nuclear power plants nor any fuel cycle facilities. As all spent fuel from research reactors has been and will be returned to the United States Department of Energy, there is no necessity for spent fuel management in Austria.

C.2 Waste containing only NORM – Article 3 Para 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 is declared as radioactive waste for the purpose of this Convention by a Contracting Party.

[2] IAEA Safety Series No 111-G-1.1 Classification of radioactive waste, A safety guide. Vienna 1994.

The Austrian Radiation Protection Legislation defines waste that contains only naturally occurring radioactive materials as radioactive waste provided that the exposure to the general public exceeds legally binding limits in the case of release of this material to the environment or in case of disposal in repositories for non-radioactive waste. If such material is declared waste (i.e. if no further use is foreseen), it is subject to the same requirements as other radioactive waste and is considered to be radioactive waste for the purpose of the Convention.

C.3 Radioactive waste from defence programs – Article 3 Para 3

This Convention shall not apply to the safety of management of spent fuel or radioactive waste within military 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.

The Austrian Radiation Protection Legislation applies without exception on the safety of radioactive waste management from civilian and military applications. All radioactive waste from military applications is sent to Nuclear Engineering Seibersdorf GmbH (NES) for treatment, conditioning and interim storage except for radioactive material which was damaged and/or lost in case of a military dispute.

Section D Inventories and Lists – Article 32 (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.

D.1 Spent fuel management facilities

There exist no spent fuel management facilities in Austria. Since Austria does not operate nuclear power plants, there is no production of high level radioactive waste (HLW). Consequently, there is no need for intermediate or final storage of HLW. All spent fuel from research reactors is sent back to the US.

D.2 Inventory of spent fuel

Only at the research reactor of the Austrian Universities in Vienna 8 spent fuel elements are in interim storage. The table shows the relevant details:

Total number of elements	Weight of the element (grams)	Weight of fissionable Isotopes (grams)
8	1450	287

D.3 Radioactive waste management facilities

The only radioactive waste management facility existing in Austria is the Nuclear Engineering Seibersdorf GmbH (NES), A-2444 Seibersdorf. This limited liability company, with a controlling stake owned by the Austrian Government, is located at the site of the Austrian Research Centers Seibersdorf, south of Vienna.

NES is responsible for the treatment, conditioning and interim storage of all radioactive waste arising in Austria and for the decommissioning of the ASTRA research reactor at the Austrian Research Centers Seibersdorf and the conversion of the reactor building into an interim storage facility. The following treatment, conditioning and waste handling facilities are in operation:

- LILW incinerator (40 kg/h),
- High force compactor (1100 t),
- Waste water treatment facility (precipitation, filtration),
- Sludge dryer,
- Cementation equipment[3],
- Hot-cell facility,
- Buffer storage facilities for raw radioactive waste,
- Interim storage facilities for conditioned radioactive waste (for details see Annex L.1).

NEW: Beginning in 2006, the building of the former ASTRA research reactor will be converted into an interim storage facility for conditioned radioactive waste. At the same time, the existing drums will be inspected, reconditioned if necessary, their nuclide inventory determined by a segmented gamma scanner, and placed back into 'transfer' storage (long-time interim storage until max. 2030) in a way that will enable individual drum inspection and retrieval. The capacity of the existing interim storage is 15,000 200-litre-drums. Because of the lower drum packing density, the capacity of the 'transfer' storage, including the rededicated reactor building, will decrease to 12,000 200-litre-drums (for details see Annex L.3).

There are no radioactive waste disposal facilities in Austria in operation (see Section B.3).

D.4 Inventory of radioactive waste

As Austria has neither nuclear power plants, nor Uranium mines or any other nuclear fuel cycle facilities, no HLW is produced in Austria. The main sources of LILW in Austria is the use of radioactive material in medicine, industry and research (30-40 tons/year) as well as the ongoing decommissioning and dismantling activities of nuclear research facilities.

[3] Authors note: Cementing is currently used as main conditioning process.

The following activity inventory is present in the Nuclear Engineering Seibersdorf GmbH (NES) interim storage facility:

- total activity of low level radioactive waste: ~ 2E+14 Bq,
- total activity of intermediate level waste:~ 1E+15 Bq.

The major amount of solid waste is combustible waste from the use of radioactive material in medicine. Liquid waste originates mainly from the NES incinerator operations (wet scrubber) and, in the past, from research reactor operations. Only a small fraction of liquid waste originates from medical facilities and universities.

The quantity of low and intermediate level waste resulting from decommissioning the ASTRA research reactor is estimated at about 160 tons. Sealed sources such as ^{60}Co, ^{137}Cs, ^{241}Am and others are widely used for industrial purposes. Sources containing ^{60}Co and ^{137}Cs are used for medical applications as radiation sources for high dose treatment. Such sources are few in number but their radioactivity dominates the total activity inventory in the Nuclear Engineering Seibersdorf GmbH (NES) interim storage. A special category of sources are radium sources used from around 1900 to about 1960 for medical treatment. They were produced in different quality and some showed a tendency for leakage. Due to the high radio toxicity of radium, their usage was discontinued and radium was replaced by safer sources as soon as they were available. More then 13 gram of radium were conditioned and are stored in the interim storage facility. Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) originating from different industrial processes is treated and conditioned at Nuclear Engineering Seibersdorf GmbH (NES).

As of 06/30/2005, there have been 9650 mainly 200-litre-drums containing conditioned radioactive waste in the interim storage facility, as well as two Mosaik© containers and two Konrad Type II containers with decommissioning waste from the ASTRA reactor.

The table below shows the relevant details:

Activity Inventory of Conditioned Radioactive Waste in Nuclear Engineering Seibersdorf (NES) Interim Storage[4]

Nuclides	Activity [Bq]
t½ < 300d	6.52E+10
t½ = 12.3a	1.819E+14
t½ < 15a	4.55E+12
t½ < 33a	5.98E+12
t½ < 432.6a	5.96E+11
t½ < 1600a	3.72E+11
t½ > 1600a	2.08E+11

D.5 Nuclear facilities in the process of being decommissioned

Two Austrian research reactors are currently under decommissioning:

Austrian Research Centers Seibersdorf

The ASTRA research reactor at the Austrian Research Centers Seibersdorf, a 10 MW thermal water-cooled and moderated swimming-pool type reactor, has been in operation since 1960 and has been finally shut down in July 1999.

[4] Authors note: Only nuclides with activities greater than 1 GBq included.

All spent fuel elements have been removed from the reactor and shipped back to the United States in May 2001. At the end of 2002 the environmental impact assessment was completed successfully. Decommission work is under way and will be concluded in the mid 2006. The resulting decommissioning waste is being treated and conditioned by NES (for details see L.1).

Reaktorinstitut Graz (Reactor Institute)

The Graz Reactor Institute has been operating a nominal 10 kW Siemens ARGONAUT reactor since 1965. The reactor was mainly driven at ultra low power levels (<1W) for training purposes within the framework of Graz Universities' education programme.

By July 2004 the reactor has been finally shut down. The fuel has been returned to the United States in autumn 2005. Due to the special use of the system the radioactive inventory of the reactor is extremely low: Only a few kilograms of LILW will arise during decommissioning; the waste will be transferred to Nuclear Engineering Seibersdorf GmbH (NES).

Section E Legislative and Regulatory System

E.1 Implementing Measures – Article 18

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.

As described below in Sections E.2 and E.3, Austria has taken legislative, regulatory and administrative measures and other necessary steps for implementing its obligations under the Joint Convention.

Conclusion: The Austrian Party complies with the obligations of Article 18.

E.2 Legislative and Regulatory Framework – Article 19

Overview – Article 19 Para 1

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

The safety of spent fuel management (regarding research reactors) and the safety of radioactive waste management are mainly governed by the federal legislation on radiation protection, consisting of the following laws and ordinances:

- Radiation Protection Act (1969)[ii] [recently amended in 2004 implementing EU legislation],
- General Radiation Protection Ordinance[iii] (2005) [replacing Radiation Protection Ordinance (1972) implementing recent EU legislation],
- Ordinance on the Transfer of Radioactive Wastes (1997)[iv].

The requirements of the legislation are detailed in the relevant building and operating licenses. Constructional and technical norms and standards designed to afford protection against radiation from spent fuel or radioactive waste are specified also on an individual basis in the different licenses.

Conclusion: As demonstrated below this recently updated legislation covers the requirements set forth in Article 19 paragraph 2, thus, the obligation under Article 19 paragraph 1 is met.

Radiation Safety - Article 19 (2) i

This legislative and regulatory framework shall provide for the establishment of applicable national safety requirements and regulations for radiation safety.

National requirements for radiation safety are established in the Radiation Protection Act, the General Radiation Protection Ordinance (2005) and the Medical Radiation Protection Ordinance (2004) with the aim to protect lives and health of individuals and their descendants, as well as the environment from the hazards of ionising radiation. It implements the principles of justification of a practice, optimization of radiation exposure and dose limitation. Detailed radiation protection measures for the handling of radioactive waste are additionally laid down in the individual operating licenses.

Important requirements regarding radioactive waste management are as follows:

- The generation of radioactive waste must be minimized. The feasibility of radioactive waste minimization has to be evaluated prior to the handling with radioactive substances.
- Radioactive waste, which is not discharged or released in line with the legal requirements,[5] must be delivered to an appropriate recycling or re-use facility or to an appropriate facility for conditioning, interim storage and later disposal.
- The possibility of cooperation with other EU Member States or other Contracting Parties to the Joint Convention has to be taken into account regarding radioactive waste management (pre-disposal treatment and disposal in order to follow the principles of risk balance, optimization of radiation protection and cost minimization.
- Radioactive waste containing radionuclides with a half-life less than 100 days has to be collected and labelled separately from waste exceeding 100 days.
- Waste containing α-nuclides must be sorted, labelled and stored separately.
- A construction and/or operating license require (among other prerequisites) the presentation of a site-specific safety analysis report and a decommissioning plan incl. a concept for closure and radioactive waste management (see below).

Beyond these specific regulations the General Administrative Procedures Act of 1991[v] and related instruments apply subsequently to the licensing procedures.

These requirements are in line with the internationally agreed standards on radiation protection. More detailed criteria concerning radiation protection are set in the individual licenses.

Licensing System – Article 19 Para 2 (ii)

This legislative and regulatory framework shall provide for a system of licensing of spent fuel and radioactive waste management activities.

The Radiation Protection Act states that a license is required for

- the construction and test, operation or change of purpose, nature and size of any installation for the handling of radioactive material and for the use of radiation emitting devices[6],
- any activity involving radioactive materials exceeding the exemption levels, i.e. work activities with radioactive materials: the extraction, production, storage, carriage, de-

[5] See Articles 74 and 79 of the General Radiation Protection Ordinance, ("Allgemeine Strahlenschutzverordnung – AllgStrSchV) - not yet published up to the time of drafting the Austrian National Report 2006.

[6] See Articles 5 to 7, Radiation Protection Act.

livery, supply, import, export processing, handling or disposal of radioactive materials or any other activity resulting in the emission of radiation and

- the possession and operation of radiation-emitting devices.

An installation for the handling of radioactive material consists of the radioactive sources and the relevant components and assemblies, devices and accommodation which are necessary for their conventional use. Austria has no separate definition for the term nuclear installation.

Among the prerequisites for granting a license for such a facility, the protection of human health and the environment as well as the operator's aptitude for meeting all the requirements must be demonstrated.

In Austria the licensing procedure for installations which in view of their operation require radiation protection measures already at the stage of their construction (=major installations, like radioactive waste management facilities) consists of two stages:

1. Construction license – Art. 5 Radiation Protection Act: For the licensing procedure the application documents must contain
    - Detailed plans and description of the planned installation;
    - a decommissioning concept for the closure of the facility including recycling or disposal of radioactive waste;
    - a safety analysis with regard to the site and potential exposure during normal operation and potential emergencies;
    - a design accident analysis;
    - a preliminary safety analysis with regard to the site and potential exposure during normal operation and potential emergencies, including a detailed description of measures for protecting the radioactive material against trespassers.

    After the licensing authority has been provided with all necessary documents, a license can be granted if the construction is in compliance with all specific obligations of the radiation protection legislation and the planned radiation protection measures are deemed adequate.

    With due respect to the protection of accrued rights of the licensee additional radiation protection measures can be required at any stage of the construction if new insights were gathered in the course of the construction or new scientific evidence have proven them necessary.
2. Operating license – Art. 6 Radiation Protection Act: For the licensing procedure the applicant must present the following documents:
    - Comprehensive documentation on the construction, modification and operation,
    - a comprehensive safety analysis for normal operation and for emergency cases,
    - a detailed design accident evaluation and a concept for on-site emergency preparedness,
    - a detailed decommissioning concept for the shut-down and closure of the facility including a waste management scheme for re-use and recycling or for disposal of radioactive waste.

    An operating license is granted if the installation has been constructed in compliance with the specified conditions and obligations, a radiation protection officer has been appointed and the regular operation of the installation entails no hazard from ionising radiation.

Regarding the licensing procedure it can be stressed that additional radiation protection measures can be required at any stage of the construction, if new insights were gathered in or new scientific evidence have proven them necessary the course of the construction. Accrued rights of the licensee, however, must be duly respected.

As a result of the Austrian federal structure, there are federal and regional authorities involved in the different radiation protection licensing procedures. The distribution of responsibilities is specified in Article 41 of the Radiation Protection Act.

The Federal Minister of Agriculture, Forestry, Environment and Water Management is the competent authority to lay down provisions for the safe management of radioactive waste. The same federal authority is also competent for granting licenses for the construction and operation of facilities for the treatment, conditioning, interim storage and disposal of radioactive waste as well as changes to them. As there is no spent fuel or high-level radioactive waste to be handled, there is no implementing body to deal with that task (see E.3).

Prohibition of operation without a license – Article 19 Para 2 (iii)

This legislative and regulatory framework shall provide for a system of licensing of spent fuel and radioactive waste management activities.

The Radiation Protection Act requires a license for the operation of a radioactive waste management facility and explicitly prohibits the construction or operation without appropriate license. There are no exceptions to this requirement.

Control, regulatory inspection, documentation and reporting - Art 19 Para 2 (iv)

This legislative and regulatory framework shall provide for a system of appropriate institutional control, regulatory inspection and documentation and reporting.

Due to the lack of major nuclear facilities in Austria and the Austrian federal structure there is no centralised regulatory body. All facilities which have been licensed according to the Radiation Protection Act are monitored and inspected at regular intervals by the competent licensing authorities[7]. They check the compliance of the license holder with the applicable regulations and the terms of the licences on an annual or biannual basis. If necessary the license holder can be requested to implement additional radiation protection measures[8]. The competent licensing and regulatory authority for the operation of installations for the management of radioactive waste is the Federal Minister for Agriculture, Forestry, Environment and Water Management.

The radiation protection legislation requires comprehensive documentation on the construction, modification and operation of facilities for the handling of radioactive material. Detailed specifications on documentation and reporting are set forth in the individual licenses.

Enforcement – Article 19 Para 2 (v)

This legislative and regulatory framework shall provide for the enforcement applicable regulations and of the terms of the licences.

The competent regulatory authorities are also in charge of enforcing the legislation and the regulations applicable to facilities for the use of radioactive material as well as the obligations of the licenses. They are empowered to take the necessary enforcement measures.

According to the Radiation Protection Act anyone building or operating an installation for the handling of radioactive material without an adequate license commits a crime and is fined with an administrative penalty of up to 25 000 EURO. Anyone not fulfilling the requirement or obligation of a license is charged with an administrative penalty of up to 15 000 EURO. The

[7] See Article 17 of the Radiation Protection Act.

[8] See Articles 5 Para 7, 6 Para 7 and 7 Para 7 of the Radiation Protection Act.

range of punishment is laid down in Article 39 of the Radiation Protection Act. The enforcement procedure is laid down in the General Administration Procedures Act complemented by the Act on the Enforcement of Administration Decisions.

Allocation of Responsibilities – Article 19 Para 2 (vi)

This legislative and regulatory framework shall provide for a clear allocation of responsibilities of the bodies involved in the different steps of spent fuel and of radioactive waste management.

The Austrian Federation is responsible for the disposal of the currently interim stored and newly produced radioactive waste in Austria. For this purpose the Federal Minister for Agriculture, Forestry, Environment and Water Management has been authorised to conclude contracts on the management and disposal of radioactive waste with appropriate facilities, obliging them to treat all radioactive waste arising in Austria[9]. In addition, the contracts must contain measures for treatment and reconditioning of the conditioned radioactive waste stored at the Nuclear Engineering Seibersdorf GmbH (NES). The contracts may also contain provisions to achieve cooperation with other EU Member States having ratified the Joint Convention. The Federal Minister as contracting authority is further entitled to control the contracts comprehensively.

Hence, the Republic of Austria (represented by the Federal Minister for Agriculture, Forestry, Environment and Water Management), the municipality of Seibersdorf and Nuclear Engineering Seibersdorf GmbH (NES) concluded a Joint Agreement on the Management of Radioactive Waste. The Republic of Austria is thus obliged to remove all conditioned radioactive waste interim stored at the site of Nuclear Engineering Seibersdorf GmbH (NES) to a final or long-term repository until December 31st, 2030 at the latest. Nuclear Engineering Seibersdorf (NES) is obliged to accept, treat, condition and interim store all radioactive wastes arising in Austria. The Republic of Austria, on the other hand guarantees NES the necessary financial funds for fulfilling their tasks, including reconditioning (if necessary) and transfer of the radioactive waste to a final repository. The Joint Agreement recently has been revised in 2003 and guarantees the operation of the radioactive waste treatment, conditioning and interim storage facilities in Seibersdorf until 2030.

Regulating Radioactive Materials as Radioactive Waste – Article 19 (3)

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

According to the definition of the Radiation Protection Act (1969) and the General Radiation Protection Ordinance (2005) give the following definition of radioactive waste:

Radioactive waste means any substance

- which contains or is contaminated with one or more radionuclides with an activity or concentration and therefore cannot be disregarded as far as radiation protection is concerned,
- which is not exempt from regulatory control and
- for which no further use is foreseen.

Exemption and clearance levels are laid down in the new Radiation Protection Ordinance which will be put into force January 1st, 2006.

NEW: The previous clearance limit of 10 µCi/m^3 has been replaced in the new General Radiation Protection Ordinance by nuclide specific values derived from the internationally accepted 10 µSv/year additional dose' concept. Clearance measurements, manual or auto-

[9] See Article 36c Para 1 and 2 Radiation Protection Act.

matic, have to be certified directly or indirectly (via approved measurement protocol) by the competent authority.

Conclusion: The Austrian Party complies with the obligations of Article 19.

E.3 Regulatory Body – Article 20

Establishment and Designation – Article 20 Para 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 fulfil its assigned responsibilities.

In the field of the safety of spent fuel management and the safety of radioactive waste management the regulatory body entrusted with the implementation of the legislative and regulatory framework referred to in Article 19 above (see Section E) is therefore divided between federal and regional authorities.

- The **Federal Minister of Agriculture, Forestry, Environment and Water Management**[10] is the competent licensing and supervisory authority with respect to radiation protection for the construction and operation of all major nuclear facilities other than for medical use including radioactive waste management facilities.
- The **Federal Minister of the Interior**[11] is the competent authority for supervision of nuclear facilities with regard to physical protection and in charge of transport safety measures with regard to the carriage of nuclear materials.
- The Federal **Minister of Economy and Labour**[12] is the competent authority for safeguards.
- The **Federal Minister of Justice**[13] is responsible for all legal matters relating to the Nuclear Liability Act[vi].
- The **Heads of Governments**[14] **of the Federal Provinces** issue licenses according to the Environmental Impact Assessment Act.
- The locally competent **Regional or District Authorities**[15] (all in all 99 districts in Austria) are the common radiation protection authorities and responsible for licensing and supervision according to the Radiation Protection Act. They issue i.e. licenses for the handling of radioactive material and can oblige the licensee to deliver their waste to Nuclear Engineering Seibersdorf GmbH (NES). Each licensee is inspected on a regular basis by the competent authority. As a part of this inspection process the records about the balance of radioactive material and of radioactive waste come under scrutiny.
- The **Mayors of the Local Communities** issue common building licenses.

Summarizing, due to the lack of major nuclear facilities in Austria and because of the federal structure there is no centralized regulatory authority in Austria. However, in the field of radioactive waste management, the main responsibilities for regulation, licensing and supervision are concentrated within the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

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[10] Bundesminister für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft.

[11] Bundesminister für Inneres.

[12] Bundesministerium für Wirtschaft und Arbeit.

[13] Bundesministerium für Justiz

[14] Landeshauptmann.

[15] Bezirksverwaltungsbehörde.

Excursus – Federalism in Austria:

The historical development of Austria is characterised by the formation and later unification of various territories under one Prince. Each of these provinces had their own bodies of laws. In 1920 the principle of federalism was anchored in the Austrian Federal Constitution. In Austria legislative and executive powers are divided between the Federal State (Bund) and the 9 self-governing, individual Federal Provinces ("Länder"). In general, legislative and executive powers are divided between the Austrian Federation (Bund) and the Austrian Federal States ("Länder"). Under the general clause of Article 15 of Austria's Constitutional Law, all the legislative and executive powers that are not explicitly delegated by the Federal Constitution to the Federal Government in Art 10 – 12 are within the competence of the Federal Provinces.

But the actual division of legislative and executive powers between the Federal State and the Federal Provinces reveals that the principle of federalism is not very highly developed in Austria. Since the Federal Constitution, however, delegates the most legislative and relevant executive competences to the federal authorities, there are only some minor legislative functions left within the autonomy of the Federal Provinces. But while the most issues are subject to federal legislation, the execution of the respective federal laws is entrusted to the Federal Provinces. Several issues are assigned to the federal government in so far as basic legislation is concerned while the implementation of the legislation and execution is left to the provinces.

Independence – Article 20 Para 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.

The owners of radioactive waste in Austria are primarily from medicine, industry and research and either private or public entities.

Both the responsibility for the safety of management of radioactive waste and the regulatory task in this field reside within the Austrian Federal State represented by the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW). BMLFUW is licensing and regulatory authority for the construction and operation of radioactive waste management facilities.

The reasons for this solution lie within the Austrian waste management policy, which requires that all organic radioactive waste has to be mineralized and stored in Seibersdorf together with LILW, which has been conditioned in a different way. The well equipped centralized waste management facility Nuclear Engineering Seibersdorf GmbH (NES) (hot-cell facility, incinerator, supercompactor…) originates from the initial plans for the operation of up to two nuclear power plants in Austria in connection with the construction and operation of a deep-geological repository. The facilities in Seibersdorf were originally built for pre-disposal treatment of LILW. As it was decided to put the plant not in operation, the related waste management facilities already had been constructed and Austria further followed its waste management policy to treat, condition and interim store radioactive waste for a longer period of time, in order to provide for final disposal in an appropriate repository.

Due to the federal structure of the Austrian State the Austrian Federal Constitution requires regional regulatory bodies in the field of health and environmental issues. In the Austrian view the implementation of a centralized separate regulatory body for this special field is not justified because Austria does operate only one research reactor and no nuclear power plants. Following the national responsibility for the safe management of radioactive waste, the high costs for the construction, maintenance and decommissioning of the installations in Nuclear Engineering Seibersdorf GmbH (NES) are estimated on the basis of today's knowledge and will be paid by the Austrian State according to the Joint Agreement between the Austrian State, the Community of Seibersdorf and Nuclear Engineering Seibersdorf GmbH

(NES). These budgetary means are agreed by the Federal Minister of Finance and will form a separate part of the budget of the Division Radiation Protection of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) and specially dedicated for Nuclear Engineering Seibersdorf GmbH (NES) until 2030. These funds are administered by BMLFUW but supervised by the Minister of Finance. With regard to this special provisions taking into account the polluter-pays-principle for the regular operation of Nuclear Engineering Seibersdorf GmbH (NES), Austria believes, that an adequate financial independence is given.

Section F Other General Safety Provisions

F.1 Responsibility of the license holder – Article 21

License Holder – Article 21 Para 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.

In Austria radioactive waste management comprises treatment, conditioning, storage and later disposal. All these activities need licensing and are carried out by Nuclear Engineering Seibersdorf (NES). As an appropriate nuclear facility, NES is operated according to the corresponding licenses and supervised by the Federal Minister of Agriculture, Forestry, Environment and Water Management.

The Radiation Protection Act clearly states in Article 3 Para 2, that the license holder is responsible for compliance with the legal provisions of the Radiation Protection Act, the corresponding Ordinances, with regulatory and administrative requirements on that legal basis as well as with all radiation protection provisions of directly applicable EU-Law. The license holder is, hence, ultimately responsible for the safety of the facility and its operation. The specific obligations of the license holder resulting from that fundamental responsibility are listed in the Radiation Protection Act and further elaborated in the General Radiation Protection Ordinance (Article 15) supported by relevant standards and guidelines of the waste management facility.

In order to ensure that the license holders meet their responsibility, Austria has established a regulatory body (see Section E.3) entrusted with the implementation of the legislative and regulatory framework. In the field of the safety of radioactive waste management the Federal Ministry for Agriculture, Forestry, Environment and Water Management forms the main part of this regulatory body. The Minister has the necessary authority and competence to fulfil his enforcement functions. His Ministry carries out annual inspections to assure that the license holder of the waste management facility meets its responsibilities and obligations and keeps the state of the art.

After 2030 all radioactive waste is to undergo final disposal in an appropriate repository. In Austria no such repository is in operation. However, if there existed a repository in Austria, it would be a nuclear facility subject to the Radiation Protection Act. The license holder would be responsible for the safety and operation of such a repository. With its supervision, the Federal Minister would ensure that this license holder also fully met its responsibility and obligations.

Unlicensed Facilities, Activities and Materials – Article 21 Para 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

In the Radiation Protection Act orphan radioactive sources are defined as “radioactive sources which are subject to authorization or at least registration and which are not under regulatory control either

- because they never have been under regulatory control or
- because they have been abandoned, lost, misplaced, stolen or
- because they have been transferred to a new holder, without proper notification of the competent authority, or without informing the recipient.

However, this definition does not apply to radioactive material in recycling material subject to a sales contract between individuals or corporate bodies capitalising on the trade of recycling material.

Article 26 of the Radiation Protection Act lays down the relevant provisions for the finding of orphan sources. The competent radiation protection authorities (in general the District Authorities) have to confiscate orphan sources and arrange for their recycling or disposal as radioactive waste at the expense of their pre-possessor. In case this pre-possessor can not be found under Austrian jurisdiction, the confiscating national or provincial authorities have to bear the costs for disposal themselves. Otherwise the occurring costs can be claimed back by recourse.

Conclusion: The Austrian Party complies with the obligations of Article 21.

F.2 Human and financial resources – Article 22

Qualified Staff – Article 22 (i)

Each Contracting Party shall take the appropriate steps to ensure that qualified staff are available as needed for safety-related activities during the operating lifetime of a spent fuel and a radioactive waste management facility.

The Austrian Radiation Protection Act requires qualified senior staff to manage and operate any nuclear facility and to fulfil all legal, regulatory and licence requirements. Verification of the necessary human resources is part of the licensing process of a waste management facility as well as the annual inspections. For each license under the Radiation Protection Act the designation of a radiation safety officer is required. The radiation safety officers are defined as qualified persons who have been designated by the licence holder to take over duties and responsibilities regarding radiation protection matters. Their formation and expertise must be approved by the competent regulatory authority. Their mental and physical ability, their reliability and aptitude for the requirements of their appointed field of activity are conditions for their designation and are regularly supervised. Further requirements, responsibilities and duties of the radiation safety officer are laid down in detail in the Radiation Protection Ordinance, the operating licence and in the technical specifications of the facility. The operator’s guidelines define specific requirements on the organization, the operating staff and on the radiation protection staff and are approved by the regulatory authority. The implementation of these legal requirements is ensured in practice by review of the projects submitted to licence and by regular supervision of the operation of the facility according to Article 17 of the Radiation Protection Act.

However, the ultimate responsibility for the safety and safe operation of a facility rests within the license holder who must demonstrate its reliability during the licensing procedure. The operating license can be withdrawn in case these requirements are not or no longer met.

Adequate Financial Resources – Article 22 (ii)

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

It is Austria's policy to collect, treat, and condition all radioactive waste for safe interim storage in order to minimise the burden for future generations. Although the problem of final disposal is not yet solved, adequate financial means are being established to support any future final disposal strategy.

According to the Joint Agreement between the Republic of Austria (represented by the Federal Ministry of Agriculture, Forestry, Environment and Water Management), the Community of Seibersdorf and the Nuclear Engineering Seibersdorf GmbH (NES) the necessary financial resources for the infrastructure and equipment of the Austrian waste management facility are guaranteed by the Austrian State. The ultimate responsibility of the Austrian Federal State for the final disposal of all radioactive waste currently and in future interim stored at Nuclear Engineering Seibersdorf GmbH (NES) ensures the availability of sufficient financial resources for the decommissioning of nuclear facilities and the final disposal of radioactive waste.

According to the Radiation Protection Act[16] the producers of radioactive waste are responsible for its safe management including disposal. They must take care that the radioactive waste is brought into a form suitable for transport, storage and disposal (conditioning), to store it pending disposal, and eventually to dispose it at their own costs. For this reason the treatment of radioactive waste is financed according to the polluter-pays-principle by the relevant licence holder, the holder of the waste (especially arising from recycling of scrap), the authorities detecting and confiscating radioactive material or receiving orphan sources. When the radioactive waste is delivered to Nuclear Engineering Seibersdorf GmbH (NES) for treatment and interim storage, a charge ("Vorsorgeentgelt") taking into account a risk premium ("Risikozuschlag") has to be paid. This charge comprises the estimated costs for interim storage, pre-disposal treatment and transport to the final repository as well as for disposal and long term management of the final repository. The final disposal fee is calculated using cost estimates based on costs of existing foreign repositories. However, should the collected funds in spite of the state-of-the art estimations prove at a later period of time to be insufficient to pay for the real costs of final disposal, the Austrian Federation covers the difference. The contributions of the producers go into a special separated fund administered by Austrian national authorities, which is exclusively dedicated for financing the later final disposal in an appropriate repository.

Financial Provision for Institutional Controls – Article 22 (iii)

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

Since there are no disposal facilities in operation in Austria, there are no special requirements laid down in the radiation protection legislation. However, according to the existing legislation, a repository could only be closed, if the permanent protection of human life and health and of their descendents and of the environment is ensured.

Conclusion: The Austrian Party complies with the obligations of Article 22.

[16] See Article 36c Para 2 of the Radiation Protection Act.

F.3 Quality assurance – Article 23

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.

Quality assurance programs are required in the licensing process and are subject to the periodic inspections by the authority according to Article 17 Radiation Protection Act. Article 5 of the General Radiation Protection Ordinance (2005) requires from each licensee the implementation of appropriate quality management systems for the safe and due operation of facilities and equipment. In particular he must provide written instructions for regular inspections of security relevant facilities and regular controls of the inventory of radioactive sources and their safe and secure storage must be carried out.

Nuclear Engineering Seibersdorf GmbH (NES) has implemented the quality management system ISO 9001. In addition NES is running a special quality assurance program for the radioactive waste management: For single batches of treated and conditioned waste samples are taken for compressive strength tests and for leaching tests. These tests are carried out according to international standards.

Conclusion: The Austrian Party complies with the obligations of Article 23.

F.4 Operational radiation protection – Article 24

The revised Radiation Protection Act and the new General Radiation Protection Ordinance form the legal basis for operational radiation protection in Austria in the non-medical field. This legislation aims at protecting human life and health and the environment against ionising radiation. It is based on the recommendations of the International Commission on Radiological Protection (ICRP) and implements the internationally agreed principles of justification of a practice, optimization of radiation exposure and dose limitation. After the recent amendment of the Radiation Protection Act and the publication of the new Radiation Protection Ordinances the provisions of the Basic Safety Standards Directive 96/26/EURATOM[vii] are fully implemented in Austrian national law. Further radiation protection requirements are defined in non-binding national standards and specific obligations are stated in the construction and operation licences granted to each operator of nuclear facilities. All activities must be performed in accordance with radiation protection regulations.

Radiation Exposure – Article 24 Para 1(i)

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

The Austrian radiation protection legislation requires optimization in line with the ALARA principle as a fundamental principle for limiting the radiation exposure of the workers and the public (Article 4 of the Radiation Protection Act and Article 3 of the General Radiation Protection Ordinance). It is the responsibility of the license holder to define and implement optimization and to implement a system to control. Depending on the level of estimated collective dose, a dose relevant job has to be controlled by a radiation safety officer. During the annual inspections according to Article 17 of the Radiation Protection Act the supervisory authority also controls how optimization is implemented.

Radiation Doses – Article 24 Para 1 (ii)

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

According to the Radiation Protection Ordinance, the dose limit for individuals of the population is set to 1mSv per year and the dose limit for occupational exposure to 20mSv per year. These dose limits are in line with international standards. The Ordinance defines reference values, limits and constraints for dose and activity to ensure that the set dose limits are not exceeded. The dose limits and working conditions for underage and pregnant women are laid down in Article 12 of the General Radiation Protection Ordinance. According to Article 12 the uterus dose of women of child-bearing age must not exceed 2 mSv over the period of one month. As a general rule the Radiation Protection Act states that pregnant women may not be assigned to any work which would result in being exposed workers (Art. 30). Nursing women may not be assigned to any work that contains handling with radioactive materials subject to licensing when there is an imminent danger of incorporation.

The Nuclear Engineering Seibersdorf GmbH (NES) employees receive training in handling radioactive materials, are equipped with personal protective devices and dosimeters, and take part in a medical monitoring program. Segregation of incoming radioactive waste is performed in a specific handling box, where the staff is comprehensively equipped with protective cloths (masks, gloves, ventilated suits). Handling of spent sealed sources is carried out in a lead cell. High activated sealed sources are handled in a hot cell facility. A safety analysis required by the national authorities is periodically reviewed by the regulatory authority.

Preventive measures taken – Article 24 Para 1 (iii)

Each Contracting Party shall take the appropriate steps to ensure that during the operating lifetime of a spent fuel or radioactive waste management facility measures are taken to prevent unplanned and uncontrolled releases of radioactive materials into the environment.

The release limits for the Nuclear Engineering Seibersdorf GmbH (NES) facility are determined by the Federal Minister of Agriculture, Forestry, Environment and Water Management as the competent regulatory authority. Annual inspections ensure the compliance of the operator of the facility with the legal and administrative requirements. If the regulatory authority is of the view that safe operation is not ensured the authority can take steps to immediately stop the operation of the facility.

Releases under normal conditions and potential releases during abnormal conditions from the facility are low enough such that transboundary emergencies can not occur. The total ^{3}H release from the Nuclear Engineering Seibersdorf GmbH (NES) waste management facility for the year 2004 was $8{,}7 \times 10^{5}$ kBq.

Radiation Exposure and Radiation Doses Due to Discharges – Article 24 Para 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.

(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.

In the licence application for the construction and operation of a facility for the handling with radioactive material or radiation emitting devices (radioactive waste management facilities included), the technical measures, i.e., barriers and air filters, taken to reduce exposure from radioactive discharges must comply with the ALARA principle. These measures are explicitly stated as obligations when granting the licence. The release of radionuclides from the waste management facility to atmosphere and water bodies is monitored by the license holder and surveyed by the licensing authority. The inspection of the nuclear installations by the authorities concerning emission and immission is set up of two parts: inspection of the quality of the internal control by the operator and independent surveillance by examination of samples taken by the authority. The exposure contribution due to the operation of the nuclear installations at the Austrian Research Centers Seibersdorf and at the Atomic Institute of the Austrian

Universities in 2003 and 2004 was negligible. Investigative measurements by the authorities of gaseous and liquid emissions and the internal surveillance by the operators show that maximum permissible levels never were exceeded. Also environmental monitoring in the surroundings did not detect any inadmissibly high gamma dose rates or immissions.

Due to the height of the stack, the critical person living approximately 700 m leeward from the stack would thus incur a maximum annual dose of 0.00016 mSv. If that total annual release was to be released instantaneously during abnormal conditions, dose levels at transboundary regions several tens of km off-site will be far below that value.

Conclusion: The Austrian Party fully complies with the obligations of Article 24.

F.5 Emergency preparedness – Article 25

Facility Emergency Plans – Article 25 Para 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.

The Federal Minister for Agriculture, Forestry, Environment and Water Management is the competent licensing authority for radioactive waste management facilities. Emergency planning is part of the licensing procedure according to the Radiation Protection Act, the General and the Medical Radiation Protection Ordinance.

Prior to the start of the construction the design of installations for handling of radioactive materials and radiation emitting devices with a higher potential risk needs to be licensed according to Article 5 of the Radiation Protection Act. This construction license facilitates the subsequent licensing procedure for operation and saves costs and requires among other documentation a concept for emergency preparedness. Prior to the operating licence of a new radioactive waste management facility, the on-site emergency plans must be approved by the Federal Minister. The emergency plans are to be periodically updated according to experience and changing requirements.

The requirements for emergency preparedness are based on the radiation protection legislation. According to the Radiation Protection Act, in case of an imminent danger from an installation in which radioactive material including radioactive waste is handled the authorities have to take all appropriate measures to avert the danger. They may issue provisional instructions and, after consulting the radiation protection officer of the installation, have to proceed in compliance with Article 4 of the Act on the Enforcement of Administration Decisions 1950[viii].

Different emergency considerations and requirements were analysed for the different waste treatment and storage units in the Austrian Research Centers (ARC) in Seibersdorf. ARC developed some time ago an on-site emergency plan for internal purposes and another one including external organisations, which had to be approved by the licensing authority. Now both plans are currently being revised because the safety situation has changed fundamentally with the shut-down and decommissioning of the ASTRA reactor. The revision must also take into account the changed organisational structure because the Austrian Research Centers (ARC) have been split up into several companies, one of them being Nuclear Engineering Seibersdorf GmbH (NES) and each company need its own emergency plan. The revised emergency plans of NES require the approval of the Federal Minister for Agriculture, Forestry, Environment and Water Management (BMLFUW) as the competent licensing authority.

In addition, BMLFUW is also the competent national authority concerning emergency preparedness on the federal level. In case of an event which should be notified according to the Early Notification Convention[ix] and according to Council Decision 87/600/Euratom[x] (ECURIE), BMLFUW is the competent authority for the notification to the respective interna-

tional organisations. Minor events with local implications must be notified to the Head of the Provincial Government.

Territory Emergency Plans – Article 25 Para 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.

The Federal Minister for Agriculture, Forestry, Environment and Water Management (BMLFUW) also becomes active in case of any radiological emergency coming from abroad. For the different roles and responsibilities in the field of off-site emergency preparedness for accidents in neighbouring countries see the table below:

Institution	Responsibilities
Federal Ministry of Agriculture and Forestry, Environment and Water Management (BMLFUW)	• Evaluation of the consequences of radiological and nuclear emergencies, • environmental monitoring for large scale radioactive contamination, • recommendations on protective measures (early and late phase), • Competent Authority for transboundary information exchange (ECurie, IAEA Convention on Early Notification and bilateral agreements).
Federal Ministry of Health and Women (BMGF)	• food monitoring • pre-planned provisions for KI-blocking
Crisis and Catastrophy Management of the Federal Ministry of the Interior (BMI)	• federal co-ordinating institution for crisis management
Federal Alarming Centre (FAC) in the Federal Ministry of Interior (BMI)	• national information exchange centre • Contact Point for information exchange with foreign countries (ECurie, IAEA Convention on Early Notification and bilateral agreements)
Nine Austrian Provinces	• Implementation of the protective measures (early and late phase)

The Radiation Protection Act obliges the BMLFUW to operate and maintain an automatic Radiation Early Warning System. In addition a laboratory-based monitoring network is operated together with the Ministry of Health and Women in order to comply with the requirements of rapid recognition and precise determination of radioactive contaminants; it performs mainly the radionuclide-specific monitoring of the air, precipitation, the surface water bodies and foodstuffs. Additional measuring data may be obtained by car-borne and air-borne dose rate measurement units which are installed in the networks of the Federal Ministry of the Interior and the Federal Army.

The systems continuously monitor the dose rate at a large number of locations. A special chapter of the Austrian Radiation Protection Act deals with large-scale radiation surveillance, monitoring in emergency situations and the implementation of remedial counter-measures.

The Austrian Radiation Early Warning System (“Strahlenfrühwarnsystem”) consists of 336 automatic dose rate monitoring stations monitoring continuously external gamma dose rates throughout the country. In addition, about 10 aerosol monitoring stations have been installed near the Austrian borders. This automatic on-line system is operated by the BMLFUW (Department Radiation Protection), supported to a large extent by contractors. Its construction

started in the mid-Seventies; and it has been operative since 1979. A major technical upgrade of the system providing state-of-the-art data handling and visualisation started in the year 2001 and has now been completed.

Measuring data of the system are transmitted on-line to the National Centre as well as to 9 Regional Centres located in the region's capitals. Consequently radiation can be monitored on the whole federal territory of Austria. The system design meets the requirements of high operational safety and reliability. The general public has permanent access to the data via the ORF-Teletext service.

The data gathered by the Radiation Early Warning and Monitoring System are exchanged on-line with the corresponding systems in the neighbouring countries of Slovenia, Slovakia, the Czech Republic and Hungary on the basis of bilateral agreements. On the basis of the recent technical upgrade of the system Austria intends to setup a similar data exchange with the remaining neighbouring states operating NPP's.

BMLFUW is obliged to operate adequate decision support systems (i.e. RODOS) based on meteorological forecast data. The information provided by the accident country (actual source term, other release parameters, etc.) provides the basis for a prognosis of possible consequences. BMLFUW has to assess the radiological situation and recommend protective and countermeasures based on the results of environmental monitoring and the results of the decision support systems. The implementation of the protective and countermeasures, however, lies within the responsibility of the Heads of the Provincial Governments.

Conclusion: The Austrian Party complies with the obligations of Article 25.

F.6 Decommissioning – Article 26

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

The Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) is in general the competent licensing authority regarding radiation protection matters in nuclear reactors and facilities outside the scope of Universities. BMLFUW issued the initial operating licence for the ASTRA reactor in Seibersdorf according to the Act on Radiation Protection based upon a general description and reactor specification, the instruction manual, a quality control plan and a safety analysis report & emergency plan (internal and external).

According to this initial operating license significant changes to its components were subject to licensing. Thus, all decommissioning activities during the first stage did not change the site license and needed no separate decommissioning license. The high-level waste (HLW) and ILW could be removed under the valid operating license of the reactor and no EIA was necessary for these activities. But as soon as the fissile materials had been removed from the reactor site, the reactor had turned into a facility without fissile materials and did not fall anymore within the responsibility of the Federal Minister of Agriculture, Forestry, Environment and Water Management. According to EU-law, for the removal of the rest of the activity (which amounts to less than 0.001% of activity one week after the final shutdown) an environmental impact assessment (EIA) was required. All subsequent activities during the second stage of decommissioning required therefore the amendment of the initial operating license according to the Radiation Protection Act. The Act on Environmental Impact Assessment of 2000, last amended in 2002 required an obligatory Environmental Impact Assessment procedure. From the time of the removal of the spent fuel the Head of the Provincial Government of Lower Austria became the competent licensing and regulatory authority. The Province of Lower Austria was from then on responsible for any modification of the original operating license, the execution of the Environmental Impact Assessment procedure and any further radiation protection measures.

As already mentioned the ASTRA Research Reactor in Seibersdorf (a 10 MW pool type) was shut down in July 1999 and is in the state of decommissioning since 2000 (see Annex L.2). During 2002 the EIA (Environmental Impact Assessment) was prepared. The public hearing was held on December 19th, 2002 and was followed by a license to decommission on April 8th, 2003. The clearance of the now empty reactor building will start in 2006, the transformation into an interim storage facility is planned till 2008 (Details are given in Annex L.3). For the next 10 years it is expected to decommission in addition to the research reactor also the hot-cell facility in Seibersdorf.

NEW: The Radiation Protection Act as amended in 2004 requires the operator of a nuclear facility to present a decommissioning plan in the application documents for the construction license. However, neither construction nor operating license usually is limited to a legal operational lifetime. Instead, the regulatory authority regularly checks, if the facility can be operated in a safe manner in line with the relevant legislation and under the conditions and requirements of the relevant licenses. Any nuclear facility must be closed, if the requirements of the legislation and of the licensing and regulatory acts are not or not longer met taking into account the state-of-the-art of science and technology.

According to the Joint Agreement between the Republic of Austria, Nuclear Engineering Seibersdorf GmbH (NES) and the Community of Seibersdorf, the waste management and interim storage facility is scheduled to be operated until 2030. From that time on the Austrian Government is responsible for transferring all interim stored waste into an appropriate final disposal facility. The radioactive waste management installations and equipment of Nuclear Engineering Seibersdorf GmbH (NES) have been subject to regular upgrading and back fitting. This process will continue until the year 2030. For this reason a licence extension is not necessary.

Staff and Financial Resources – Article 26 (i)

Such steps shall ensure that qualified staff and adequate financial resources are available.

Adequate financial resources for the decommissioning of existing R&D facilities are guaranteed by a second agreement between the Republic of Austria (represented by the Federal Minister of Transport, Infrastructure and Technology) and the Nuclear Engineering Seibersdorf GmbH (NES). Ultimately, the Austrian Government has taken over responsibility for the costs of decommissioning of nuclear facilities, which have been and are operated and owned finally by the Austrian State (research reactors and waste management facility). For this reason and due to the lack of nuclear power plants no special decommissioning fund has been established.

Nuclear Engineering Seibersdorf GmbH (NES) has qualified, experienced staff for decommissioning the ASTRA research reactor. But also younger personnel, with a reactor operator's background, experienced in engineering and handling of radioactive materials, with knowledge in hot cell work has been trained to continue the operation of the interim storage facility after decommissioning. Together with an already established staff group managing the industrial radioactive source service, they will be qualified to operate the new facility. However, Nuclear Engineering Seibersdorf GmbH (NES) is provided with adequate financial resources for the recruitment of qualified external staff, if necessary.

Radiation Protection – Article 26 (ii)

Such steps shall ensure that the provisions of Article 24 with respect to operational radiation protection, discharges and unplanned and uncontrolled releases are applied.

The Radiation Protection Act and the General Radiation Protection Ordinance apply to the decommissioning of nuclear facilities as well. This legislation covers all aspects of Article 26 (ii) (see Section F.4). Since the shut-down, dismantling and decommissioning are major modifications to the operation of a facility for the handling with radioactive material, these

activities need a license according to Article 8 of the Radiation Protection Act. This decommissioning licence accordingly lays down complementary obligations as appropriate.

Emergency Preparedness – Article 26 (iii)

Such steps shall ensure that the provisions of Article 25 with respect to emergency preparedness are applied.

The legal requirements concerning emergency preparedness apply independently of whether a facility is in operation or under decommissioning. These requirements cover all aspects of Article 26 (iii) (see Section F.5).

Record Keeping – Article 26 (iv)

Such steps shall ensure that records of information important to decommissioning are kept.

The decommissioning license is part of the Environmental Impact Assessment procedure, which requires the facility operators to keep and to update all technical records until decommissioning is completed. After completion of decommissioning, the operator has to hand over the documentation to the regulatory authorities.

Conclusion: The Austrian Party complies with the obligations of Article 26.

Section G Safety of Spent Fuel Management – Article 4-10

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.

Austria runs only one research reactor. All spent fuel will be returned to the U.S. Department of Energy. Since Austria has only to take care for interim storage on site of very small amounts of spent fuel, the safety of spent fuel management is not an issue in Austria.

Conclusion: Articles 4-19 are not applicable.

Section H Safety of Radioactive Waste Management

H.1 General Safety Requirements – Article 11

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.

The protection of individuals, society and the environment against radiological and other hazards is subject to the Austrian legislation on radiation protection, as detailed in Section E.2, and to the legislation on environmental protection (mainly the Environmental Impact Assessment Act and associated ordinances).

Protection of the environment from hazards other than radioactivity is verified by the Federal Minister of the Agriculture, Forestry, Environment and Water Management (BMLFUW) on the basis of the Environmental Impact Assessment Act 2000[xi], which requires en EIA for major facilities and on the basis of the Environmental Management Act[xii], which implements the EU eco-management and audit scheme (EMAS).

During operation, the protection of workers is assured by requirements and compliance checks of the Austrian Labour Inspectorate (“Arbeitsinspektorat”) and the Occupational Health Services (“Arbeitsmedizinischen Dienste”).

Civil protection is a competence of the Federal Minister of the Interior, implemented by the Provincial Authorities. Compliance with the legislation on protection of the general population and the environment from non-radiological hazards is verified by Provincial Authorities ("Federal Länder").

Criticality and Removal of Heat – Article 11 (i)

In so doing, each Contracting Party shall take the appropriate steps to ensure that criticality and removal of residual heat generated during radioactive waste management are adequately addressed.

Criticality and removal of residual heat are not an issue for the LILW waste in the Nuclear Engineering Seibersdorf GmbH (NES) interim storage.

Generation of Radioactive Waste – Article 11 (ii)

In so doing, each Contracting Party shall take the appropriate steps to ensure that the generation of radioactive waste is kept to the minimum practicable.

Minimization of radioactive waste is required by the Radiological Protection Act. The feasibility of radioactive waste minimization has to be evaluated prior to each handling with radioactive substances. The compliance is verified by the regulatory body during licensing procedure, issuance of operation permits, and periodic inspections. Until now there has never been any reason for a regulatory enforcement action regarding minimization of radioactive waste.

Interdependencies – Article 11 (iii)

In so doing, each Contracting Party shall take the appropriate steps to take into account interdependencies among the different steps in radioactive waste management.

Optimization is required by the Austrian Radiation Protection Legislation at all stages of radioactive waste management, thus interdependencies among the different steps are in practice taken into account. Nuclear Engineering Seibersdorf GmbH (NES) periodically performs an optimization study comparing the available options for the treatment, conditioning, storage and disposal of radioactive waste. The licensing procedures as well as the periodic inspections by the regulatory authority take into account interdependencies among the different steps in radioactive waste management.

Protection of Individuals, Society and the Environment – Article 11 (iv)

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

The Austrian Radiation Protection Legislation aims at the protection of individuals, society and the environment from the effects of ionizing radiation (see Section E.2) by fully implementing the EU Basic Safety Standards Directive 29/96/Euratom based upon the ICRP system of justification, optimization and dose limitation.

The applicable dose limits are compatible with the International Basic Safety Standards (IAEA Safety Series No. 115). In particular, a dose limit for members of the public of 1 mSv effective dose per year and a dose limit for workers of 20 mSv per year are implemented.

The protection of the environment against hazards other than radioactivity is the subject of different legal instruments.

During the operational phase compliance with the legislation is verified and enforced by regulatory supervision, mainly by annual inspections. The regulatory supervision includes monitoring of the radioactivity in the environment of the facility. Compliance with the environmental protection legislation is verified by the responsible Cantonal authorities.

Biological, Chemical and other Hazards – Article 11 (v)

In so doing, each Contracting Party shall take the appropriate steps to take into account the biological, chemical and other hazards that may be associated with radioactive waste management.

Biological, chemical and other hazards are subject to the environmental protection legislation, which also aims at human health protection, especially with requirements concerning air and water quality. An Environmental Impact Assessment is required prior to the construction license and for the operation permit. This assessment is reviewed by the appropriate environmental protection authorities before the licence is issued. Hazards other than radiation encountered by workers during handling radioactive material are covered by general legislation on safety in working places, enforced by supervision by the Austrian Labour Inspectorate (Arbeitsinspektorat).

Impacts on Future Generations – Article 11 (vi)

In so doing, each Contracting Party shall take the appropriate steps to strive to avoid actions that impose reasonably predictable impacts on future generations greater than those permitted for the current generation.

There are currently no final disposal facilities for radioactive waste in operation or under construction in Austria.

Burdens on Future Generations – Article 11 (vii)

In so doing, each Contracting Party shall take the appropriate steps to aim to avoid imposing undue burdens on future generations.

It is Austria's policy to collect, treat, and condition all radioactive waste for safe interim storage in order to minimise the burden for future generations. Although the problem of final disposal is not yet solved, adequate financial means are being established to support any future final disposal strategy.

Conclusion: The Austrian Party complies with the obligations of Article 11.

H.2 Existing facilities and past practices – Article 12

According to a Joint Agreement between the Republic of Austria, the Community of Seibersdorf and Nuclear Engineering Seibersdorf GmbH (NES) from 1976 (revised in 2003) all radioactive waste arising in Austria has been collected including the radioactive waste from the IAEA laboratories in Seibersdorf. Since then a number of storage halls and other facilities were financed by the state and built at Seibersdorf. Different categories of waste (liquid burnable, liquid non burnable, solid burnable, solid non burnable, etc.) were stored in specifically designed storage halls. At 1965 a concrete trench, separated in four boxes, was made for taking up intermediate level waste. After installation of treatment facilities, especially the incineration plant and the high-force compactor, all this "historical waste" was treated, conditioned in 1999 and 2000 and is actually stored in the interim storage facility. The boxes of the trench are all empty (for detailed information see Annex L.1).

H.3 Siting of proposed facilities – Article 13

Safety, Impact and Information – Article 13 Para 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.

Austria does not intend to build further radioactive waste management facilities, including final or long-term repositories in Austria, hence, the Austrian legislation does not yet contain detailed provisions for the siting of radioactive waste disposal facilities.

Effects on other Contracting Parties – Article 13 Para 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.

Even though no specific provisions for siting of disposal facilities are yet foreseen in the Austrian legislation, general rules for the construction of installations apply and must consider safety regarding the construction site. In the frame of a bilateral agreement with the neighbouring states in practice licence applications for any installations are reviewed and the potential radiological effects assessed.

Conclusion: The Austrian Party complies with the obligations of Article 13. The lack of special legal provisions for the siting of disposal facilities results from the Austrian policy not to build disposal facilities on the Austrian territory in the near future.

H.4 Construction, safety assessment and operation – Article 14

Limitation of Radiological Impacts – Article 14 (i)

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

The licensing procedure for the construction of a facility for the handling with radioactive material, including waste management facilities, requires the presentation of a safety analysis, which is reviewed by the radiation protection authorities. The safety analysis must demonstrate that human life and health and the environmental are protected against the hazards of ionising radiation during normal operation and possible emergencies. (See Section L.1)

Decommissioning – Article 14 (ii)

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

The Radiation Protection Act requires for any major facility a decommissioning concept at the stage of the construction license (for details see Section F.6 and Annex L.2).

Closure of Disposal Facility – Article 14 (iii)

Each Contracting Party shall take the appropriate steps to ensure that at the design stage, technical provisions for the closure of a disposal facility are prepared.

There are no disposal facilities in Austria; however, the required decommissioning concept (see above) includes provisions for the shut down.

Technologies – Article 14 (iv)

Each Contracting Party shall take the appropriate steps to ensure that the technologies incorporated in the design and construction of a radioactive waste management facility are supported by experience, testing or analysis.

The equipment and devices at Nuclear Engineering Seibersdorf GmbH (NES) are regularly inspected and if required or deemed necessary modernized and back fitted based upon the state-of-the-art.

Conclusion: The Austrian Party complies with the obligations of Article 14.

H.5 Assessment of Safety of Facilities – Article 15

Safety Assessment – Article 15 (i)

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

An Environmental Impact Assessment (EIA) is required prior to the construction license based upon the Environmental Impact Assessment Act (EIA-Act).

Post-Closure Safety Assessment – Article 15 (ii)

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

There is no disposal facility in operation or planned. However, an EIA of radiological and non-radiological hazards is a requirement of the EIA-Act.

Update of Safety Assessment – Article 15 (iii)

Each Contracting Party shall take the appropriate steps to ensure that 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).

Periodic safety reviews are carried out each year during the operation of a waste management facility by the Federal Minister of Agriculture, Forestry, Environment and Water Management as the competent regulatory authority.

Conclusion: The Austrian Radiation Protection Legislation does not contain detailed requirements for safety assessment of radioactive waste management facilities during the licensing process. However, annual inspections make sure, that facilities are operated safely.

H.6 Operation of Facilities – Article 16

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

The operation licence for an installation for the handling of radioactive material, including radioactive waste management facilities, is granted based on a safety analysis report demonstrating inter alia the suitability of the site. In the case of radioactive waste management facilities the Federal Minster for Agriculture, Forestry, Environment and Water Management

(BMLFUW) supervises the construction of the facility and makes sure that the facility is built in accordance with the construction licence.

The Radiation Protection Act does not contain special provisions for disposal facilities; the general rules for the operation of installations for handling with radioactive material apply. The operation license is granted if the licensee has successfully demonstrated the compliances with all legal and administrative requirements including the suitability of the site. Further radiation protection measures can be required by the licensing authority if findings gained during construction make them necessary for radiation protection reasons. The operation license is issued after the test operation in the framework of the construction license has demonstrated that the facility fulfils all safety and other requirements.

Defining and Revising Operational Limits and Conditions – Article 26 (ii)

Each Contracting Party shall take the appropriate steps to ensure that operational limits and conditions, derived from tests, operational experience and the assessments as specified in Article 15 are defined and revised as necessary.

BMLFUW supervises and inspects the commissioning and operation of each radioactive waste management facility and of University research facilities jointly with the Federal Minister of Education, Science and Culture. Minor facilities are in general inspected and supervised by the Provincial Authorities. All inspections are based upon Article 17 Radiation Protection Act and include the review and approval of operational conditions for the particular installation. According to the Radiation Protection Act any changes to operational limits and conditions require a permit the competent licensing authority, which has the competence to revise operational limits and conditions as necessary for reasons of safety.

Accordance with Established Procedures – Article 16 (iii)

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

Operation, maintenance and monitoring of installations for the handling of radioactive material, including radioactive waste management facilities, are specified in the operation licence. The corresponding procedures as described in the facility operation documents are reviewed by the competent regulatory authority. Their adequacy is a condition for issuing the operation license. BMLFUW is entrusted with the supervision of radioactive waste management facilities and carries out annual inspections. BMLFUW is empowered to enforce compliance with all requirements.

Engineering and Technical Support – Article 16 (iv)

Each Contracting Party shall take the appropriate steps to ensure that engineering and technical support in all safety-related fields are available throughout the operating lifetime of a radioactive waste management facility.

According to the Radiation Protection Act, the fulfilment of requirements regarding the staff and the organization is a prerequisite for the granting of the operation licence for an installation for the handling with radioactive material. The requirements concerning staff and organization are outlined in the Radiation Protection Ordinance (Article 30) and more specifically elaborated in the Guidelines HSK-R-27 and HSK-R-37. They include the availability of engineering and technical support. HSK inspects and supervises the qualification of the personnel for nuclear facilities including radioactive waste management facilities. HSK has the competence to intervene if it determines that a lack of technical or engineering support could impact on the safety of the facility.

Characterization and Segregation of Radioactive Waste – Article 16 (v)

Each Contracting Party shall take the appropriate steps to ensure that procedures for characterization and segregation of radioactive waste are applied.

Conditioning of radioactive waste is handling with radioactive material and therefore needs licensing. The approval depends, among other things, on the measures taken to ensure that the properties of the waste and its characterization are optimal in view of the further waste management steps. The producer of radioactive waste is obliged to segregate and label the waste according to the following categories: liquid-combustible, liquid-non-combustible, solid-combustible, solid-non-combustible, gaseous, biogenous waste, sealed radioactive sources considered waste, bulky waste, composed waste, different hazardous wastes.

Reporting of Incidents – Article 16 (vi)

Each Contracting Party shall take the appropriate steps to ensure that incidents significant to safety are reported in a timely manner by the holder of the licence to the regulatory body.

Regular reporting is required on the occasion of the annual inspections according to Article 17 Radiation Protection Act. The Radiation Protection Act requires that the licensing holder immediately reports any incident that could have led to a non negligible exposure to a radiation worker.

Collection and Analysis of Operating Experience – Article 16 (vii)

Each Contracting Party shall take the appropriate steps to ensure that programmes to collect and analyse relevant operating experience are established and that the results are acted upon, where appropriate.

During the annual inspections of the regulatory authority all relevant operating experiences are analysed. If the experience during operation or new scientific evidence reveals that additional radiation protection measures are required, the licensing holder can be obliged by the regulatory authority to fulfil these additional requirements taking into account acquired rights.

Decommissioning Plans and Closure of Disposal Facility – Article 16 (viii)-(ix)

Each Contracting Party shall take the appropriate steps to ensure

(viii) that 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) that 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.

The general requirements for the operation of an installation for the handling with radioactive material, including radioactive waste management facilities, apply. Annual inspections of the regulatory authority (BMLFUW in case of radioactive waste management facilities) make sure, that the decommissioning plans including shut-down and radioactive waste management scheme are updated and revised during the operation of the facility.

The closure and decommissioning of the Nuclear Engineering Seibersdorf GmbH (NES) radioactive waste management facility scheduled for 2030 is regulated by the Joint Agreement between the Republic of Austria, the Community of Seibersdorf and Nuclear Engineering Seibersdorf GmbH (NES).

Conclusion: The Austrian Party complies with the obligations of Article 16 of the Convention.

H.7 Institutional measures after closure – Article 17

Keeping Records – Article 17 (i)

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility records of the location, design and inventory of that facility required by the regulatory body are preserved.

In Austria no disposal facility is in operation. For this reason the Austrian legislation does not yet contain specific legal requirements for a closure of such a disposal facility. There are currently no plans for closure of the existing Nuclear Engineering Seibersdorf GmbH (NES) interim storage and pre-disposal management facilities. No unresolved issues related to closure exist.

Institutional Controls – Article 17 (ii)

Each Contracting Party shall take the appropriate steps to ensure that after closure of a disposal facility active or passive institutional controls such as monitoring or access restrictions are carried out, if required.

Since there are no disposal facilities operated and therefore to be closed in Austria in the near future, specific regulations of the institutional controls after closure have not been decided yet. The Radiation Protection Act allocates the corresponding decisions to the federal government.

Intervention Measures – Article 17 (iii)

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

Austria has implemented a national monitoring programme of the radioactivity in the environment. This monitoring is performed by the Federal Minister for Agriculture, Forestry, Environment and Water Management. The intervention measures to be taken in the case of increased environmental radiation are established by the radiation protection legislation and by. The responsibility for such potential intervention measures lies with the federal State.

Conclusion: Since no disposal facilities are in operation in Austria, no specific legislation for the closure of such a facility are yet in place. However, in the meantime the provisions for any major installation for the handling with radioactive material or the use of radiation emitting devices apply.

Section I Transboundary Movement – Article 27

I.1 General Requirements - Article 27 Para 1

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

Authorization by State of Destination – Article 27 Para 1 (i)

In so doing, 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.

Transboundary movement of radioactive sources above the exemption limits laid down in the Radiation Protection Ordinance are subject to the directly applicable Council Regulation (EURATOM) No 1493/93 on shipments of radioactive substances between Member States[xiii]

The import, export and transit of radioactive waste (including spent fuel declared as waste) are subject to an authorization issued under the Ordinance on the Supervision and Control of Shipments of Radioactive Waste into, out of or through the Austrian Federal Territory, which implements the Council Directive 92/3/EURATOM[xiv]. As a general rule the import of radioactive waste for final disposal or interim storage is generally prohibited. Any transportation of fissionable material on Austrian territory is prohibited unless under an international agreement. Fissionable material for the purpose of peaceful use if not for the production of nuclear power can be transported. The transport of fissionable material arising from the nuclear energy production if also prohibited if the purpose is final disposal[17].

According to this Ordinance every crossing of the Austrian border by radioactive waste needs consent or approval by the competent Austrian authority. The Annexes to the Ordinance define, inter alia, the form of the applicable standard documentation and the list of quantities and concentration levels for radioactive waste. The Standard Document according to the Council Directive 92/3/Euratom has to be used. In addition general safety requirements are laid down in the revised Radiation Protection Act (1969) and the General Radiation Protection Ordinance (2005).

Export of radioactive waste for recycling, treatment, conditioning, storage or disposal is possible, but requires authorization according to a specific system of approval and notification. According to Article 8 Para 1 an approval can be granted if,

- there is no indirect or imminent danger for the human life or health including human descendants from ionising radiation, and
- if the State of Destination and the States of Transit, if any, have agreed to the import for the stated purposes within the framework of an international agreement or within the applicable European Community or EURATOM Law, and
- if the exporter has entered into a binding written agreement with the importer of the radioactive waste which stipulates, that the exporter shall take back the waste if the shipment cannot be completed according to the relevant legal provisions or the conditions attached to the approval and
- if there are no reasons for the refusal of an approval according to Article 11 of the Radioactive Waste Shipment Ordinance: In case Austria is the State of Origin and a third country (non EU Member State) is the State of Destination, which in view of the competent Austrian authorities does not have the administrative or technical capacity, or the appropriate regulatory structure to treat, condition, interim store or dispose imported radioactive waste in a manner consistent with the Convention, Austria must refuse the approval.

Movements through States of Transit – Article 27 Para 1 (ii)

In so doing, transboundary movement through states of transit shall be subject to those international obligations which are relevant to the particular modes of transport utilized.

The international transport of radioactive material by road is primarily subject to the "European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)" to which Austria is a Party. Austria is also a party to the European Agreement on the International Carriage of Dangerous Goods by rail (RID). Air transport is covered by the ICAO-Technical Instructions for the Safe Transport of Dangerous Goods by Air implemented by the Act on the Carriage of Dangerous Goods. Licences for export are not issued unless

[17] See Article 3 of the Constitutional Law on a non-nuclear Austria.

the international obligations relevant to the modes of transport used are fulfilled. The provisions of ADR, RID and ICAO apply directly. Under the Act on the Carriage of Dangerous Goods[xv] (1998) they also apply to domestic carriage of dangerous goods within Austria. In addition to ADR, there are provisions of the Act on the Carriage of Dangerous Goods which refer to, implement and complete the ADR.

The Act on the Carriage of Dangerous Goods also implements several directives of the European Union concerning the carriage of dangerous goods by road, rail and inland navigation, which also refer to, implement and complete the international agreements mentioned above. Since the relevant international legal instrument for the transport of dangerous goods by inland navigation (ADN) has not yet come into effect, the transport of radioactive material is subject to the provisions of an ordinance[xvi] based on the 1997 Federal Act on Inland Navigation[xvii] and to the provisions of the Act on the Carriage of Dangerous Goods, as far as they are common to all modes of transport.

Regardless of the applicable law of the state in which a harbour is located, the transport of radioactive materials by sea ships registered in Austria has to comply with the International Maritime Organisation (IMO) Dangerous Goods Code. The provisions of this IMDG-Code are also referred to in the Act on the Carriage of Dangerous Goods. As far as the international legal instruments mentioned in this item (RID/COTIF, ADR, ICAO-TI, IATA-DGR, ADN, IMDG-Code) relate to the transport of radioactive materials, they are mainly based on provisions published by the IAEA (Safety Series No. 6, ST-1 und ST-2).

Requirements for State of Destination – Article 27 Para 1 (iii)

In so doing, a Contracting 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.

According to Article 7 of the Radioactive Waste Shipment Ordinance the approval of a shipment of radioactive waste into the Austrian territory has to be refused in cases

- of an imminent or indirect danger for the human health or life including human descendants from ionising radiation, or
- where no licence for the intended or predicted use or handling has been issued according to the radiation protection legislation, or
- the competent national authorities have not been supplied with a takeover agreement between the licensee and an appropriate facility for the storage of radioactive waste, or
- the capacity for conditioning or processing of radioactive waste is too low in Austria and the proper management of radioactive waste arising in Austria is at risk,
- the route of transport causes impacts infringing the radiation protection legislation, especially not justifiable exposure to individuals of the population,
- a take-back declaration of the holder of the waste is missing for the case that the transportation procedure cannot be completed,
- the data and specifications or the comments of the competent authorities in the standard document apparently are missing or incomplete and
- there is no guarantee that the shipment into the Austrian territory is not carried out for the purpose of final disposal or interim storage, unless the interim storage is only necessary preparation or part of the timely treatment or conditioning and the radioactive waste is transferred back out of the Austrian territory.

The Radioactive Waste Shipment Ordinance prohibits any import of radioactive waste not originating from Austria for final disposal or interim storage purposes (unless under an international agreement). Austria has no final repository for disposal of radioactive waste.

Meeting the Requirements for State of Destination – Article 27 Para 1 (iv)

In so doing, 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.

According to the Article 8 of the Radioactive Waste Shipment Ordinance a licence is required for the export of radioactive waste. The conditions are explained in detail therein (see above Article 27 Para 1 (i)). They ensure that the respective requirements the Convention are fulfilled.

Re-entry in case of non-conformity – Article 27 Para 1 (v)

In so doing, a Contracting Party which is a State of origin shall take the appropriate steps to permit a 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.

In case of a shipment of radioactive waste from Austria to a destination out of the Austrian territory the Radioactive Waste Shipment Ordinance requires explicitly a written and legally binding agreement between the holder and the consignee, obliging the holder to take back the radioactive waste in case the shipment procedure cannot be accomplished or the conditions attached to the approval of the shipment are not fulfilled.

The competent national authorities, which did approve transit for a given shipment may not refuse to approve the reshipment if the initial shipment was approved for treatment or reprocessing purposes and if the reshipment concerns radioactive waste or other products equivalent to the original material after treatment or reprocessing when all relevant legislation is respected. In case of a shipment failure, the national authorities must allow for the reshipment, if a transboundary movement cannot be completed in conformity with the relevant legislation and the reshipment is undertaken in a safe manner on the same conditions and with the same specifications as stated in the initial application.

I.2 Shipments south of Latitude 60 – Article 27 Para 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.

According Article 11 of the Ordinance on the Transfer of Radioactive Wastes the competent authorities must refuse granting a license for shipments

- to a destination south of latitude 60 degrees south or
- to a State Party to the Cotonou ACP-EC Agreement which is not a member of the European Community, taking into account reshipments
- to a third country, which does not have the technical, legal or administrative resources to manage the radioactive waste safely in the opinion of the competent authorities of the country of origin. , (The provisions and criteria for reshipment must be taken into account.).

Conclusion: Austria fulfils the requirements of Article 27 of the Convention.

Section J Disused Sealed Sources – Article 28

J.1 Possession, Remanufacturing and Disposal – Article 28 Para 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.

In Austria anyone who envisages handling with radioactive sources exceeding the exemption limits must apply for a license according to Article 10 of the Radiation Protection Act. The relevant regional authorities ("Bezirkshauptmannschaften") of each Austrian Province are the competent licensing authorities in this respect.

The Radiation Protection Act obliges the Federal Minister of Agriculture, Forestry, Environment and Water Management (BMLFUW) to implement, maintain and update basis a centralized register for all radioactive sources exceeding the exemption levels. Exemptions from the requirement to report are made i.e. in case the radioactive material is below given activity limits or in case of transports of radioactive material in compliance with the relevant transport regulations. This register, which will be put into operation in 2006, will contribute to estimate future amounts of radioactive waste. Now that the Electronic Administrative File System (ELAK) has been introduced to the Austrian administration, the Federal Ministry of Agriculture, Forestry, Environment and Water Management is planning to set up a register of licences.

The possession of such sources is subject to certain obligations.It is therefore in the interest of the owner return disused sources as soon as possible to the manufacturer or to deliver them to the Nuclear Engineering Seibersdorf GmbH (NES). The costs for this process are born by the owner.

The use of sealed radiation sources is regulated by the Radiation Protection Act and the corresponding Ordinances. The radiation protection legislation requires minimisation of radioactive waste. According to this requirement, disused sealed sources shall, as far as possible, be stored on the site of the former user pending recycling for further use. If this is not possible, disused sealed sources shall be transported to Nuclear Engineering Seibersdorf GmbH (NES) for temporary storage pending reuse. Non recyclable sources must thus be returned to the manufacturer. If sealed sources are declared radioactive waste, they have to be transferred to NES for conditioning and interim storage. In any case the storage must take place according to applicable legal radiation protection regulations.

J.2 Re-entry into Territory – Article 28 Para 2

A Contracting Party shall allow for re-entry 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 source.

Austria allows for the re-entry of disused sealed sources into its territory. Import and export of all radioactive sources need prior licensing if their activity is above the exemption limit set in the Radiation Protection Ordinance implementing the Basic Safety Standards Directive 96/29/Euratom. The requirements for a shipment of radioactive sources are laid down in the EU Council Regulation No 1494/94/Euratom of 8 June 1994 on the shipment of radioactive substances between Member States, which is directly applicable for the import and export of radioactive sources. One major requirement for an export licence is that the consignee holds an appropriate licence for handling this radioactive material. Nuclear Engineering Seibersdorf GmbH (NES) is the only manufacturer of sealed sources in Austria. Most of the produced sources are distributed to domestic users and some are used abroad by Austrian companies. In any case all of these sources are taken back by Nuclear Engineering Seibersdorf GmbH (NES) if no longer used or spent.

Conclusion: Austria complies with the obligations of Article 28.

Section K Planned Activities to Improve Safety

As is shown in the present report, the safety of spent fuel management and the safety of radioactive waste management in Austria comply with the obligations of the Convention. There is thus no imminent need for measures to improve safety in Austria. However, Austria strives for continuing improvements of safety. In this regard the following projects can be mentioned.

Based on the Joint Agreement between the Republic of Austria, the Community of Seibersdorf and Nuclear Engineering Seibersdorf GmbH (NES) approximately € 450 000 have been invested annually into the modernization of the waste treatment facilities in Seibersdorf since 2003. This investment program will continue until 2030.

In this respect the installation of an automated tomographic gamma scanner (TGS) is currently in the engineering and fabrication stage. This unit, scheduled to replace the outdated integral gamma scanner in early 2005, will be able to perform highly accurate gamma spectrometry measurements of 200-litre-drums with (re)conditioned radioactive waste, including spatial activity distribution, prior to placement of the drums in interim storage. In order to further improve the monitoring of emissions from the incinerator and the radiation protection of the workers, new equipment will be installed in the incinerator facility in 2006. It will include radiological stack emission, dose rate, and aerosol monitoring equipment.

For the near future it is planned to adapt the existing ASTRA reactor building in Seibersdorf as an interim storage facility to ensure individual inspection of each single drum (for details see Annex L.3).

The amendment to the Radiation Protection Act (1969) which entered into force January 1st, 2005 requests several further ordinances, which are still under development. This work concerns first of all NORM, cosmic radiation and interventions. The new General Radiation Protection Ordinance (2005) is scheduled to enter into force on January 1st, 2006 and will replace the Radiation Protection Ordinance (1972). The Ordinance on the Protection of Health and Life of the Air Crew from the Hazards of Cosmic Radiation is currently reviewed by the stakeholders, the national and regional authorities and experts. Its entry into force is scheduled for the first quarter 2006. The Ordinance on Interventions in case of Radiological Emergencies and Past Practices and the Ordinance on Naturally Occurring Radioactive Material will soon enter into review.

Section L Annexes

L.1 Nuclear Engineering Seibersdorf GmbH (NES)

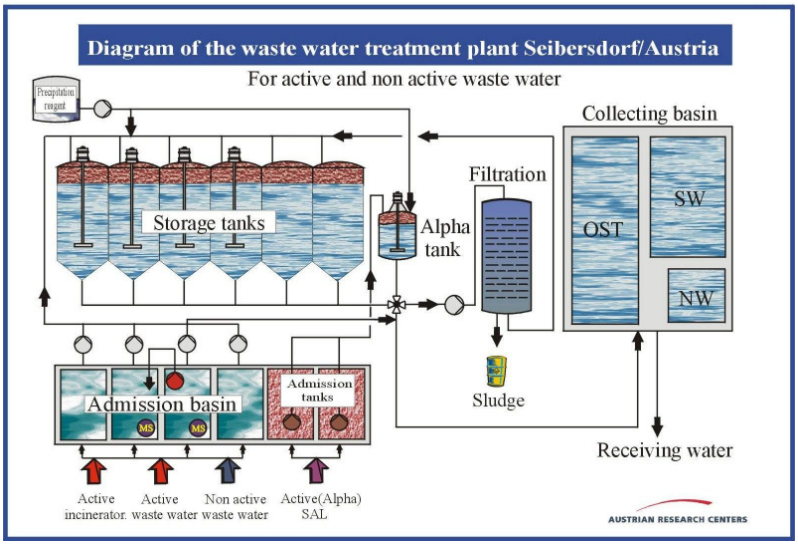
The following chapters describe in short the existing radioactive waste management facilities of the Austrian centralized pre-disposal and interim storage facility Nuclear Engineering Seibersdorf GmbH (NES).

Segregation

Pre-sorting of radioactive waste is required from the waste producers. For specific tasks, such as dismantling of larger equipment, a special room ("sorting box") equipped with a negative pressure ventilation system is used. Depending on the hazards involved, work is carried out in supplied-air suits or full-face masks.

Waste water treatment facility

In this facility, waste water from the Nuclear Engineering Seibersdorf GmbH (NES) site in Seibersdorf is treated. The four waste water sources include incinerator operations, laboratories working with radioactive material, all other laboratories on site (theoretically inactive waste water), and the IAEA Safeguards Analytical Laboratory (SAL) delivering potentially α-contaminated waste water.



Waste water treatment plant Seibersdorf

The Figure shows a schematic depiction of the facility. As a first step, waste water is delivered via direct pipeline connections from the point of origin into separate admission basins. Measurements are then performed to determine the activity of the waste water. If below the regulatory limits, the water is transferred directly into the collecting basin and, after repeated measurements, discharged into the environment. In the opposite case, the water is pumped into the storage tanks, some equipped with stirrers, where a precipitation is performed by addition of a suitable reagent, i.e., $[Fe(CN)_6]^{4-}$ for Cs^+ precipitation. The active precipitate is separated from the liquid in a Filtrox® filtration unit. The resulting sludge is dried and conditioned in the high force compactor. The liquid is pumped back into the storage tanks, re-

checked for activity, and transferred into the collecting basin. Occasionally, a second precipitation may be called for to comply with the regulatory limits.

High-force compactor

Non burnable solid radioactive waste can be treated using the high-force compactor. This unit is of horizontal design. Steel 100-litre-drums containing solid waste are fed into an opening from top into the channel of the ram. When operating the ram, the content in the channel is compressed into the compaction station with a compaction force of 12 MN. Pellets formed in this way are ejected after opening the compaction station and transferred into 200-litre-drums for storage.

Depending on the waste characteristics, a volume reduction factor of 2 to 10 can be reached.

Supercompactor

Cementation equipment, types of storage containers

The main conditioning and immobilization method currently in use is cementation (grouting).

With some exceptions, only steel 200-litre-drums are in use. The exceptions include a small number of pre-cemented containers used for storing higher-activity waste which needs additional shielding. These containers have a wall thickness of 20 cm concrete and can take up one 200-litre-drum each. Other types of containers, i.e., Mosaik or Konrad Type II are used for bulky waste.

Homogeneous cementation is carried out in-drum or by mixing waste with cement and water in a separate mixer and filling the mixture into 200-litre-drums.

Heterogeneous cementation is performed in by placing 100-litre-drum with waste into 200-litre-drums and filling the annular cavity with cement.

Pellets from the high force compactor are also placed in 200-litre-drums. The voids are filled with quartz sand.

Cementation equipment

Interim storage

All conditioned radioactive waste is stored within two dry engineered construction storage halls. The capacity is limited to 15,000 200-litre-drums. As of June 2005, 9650 drums were in interim storage. Beginning in 2006, the building of the former ASTRA research reactor will be converted into an interim storage facility for conditioned radioactive waste. At the same time, the existing drums will be inspected, reconditioned if necessary, their nuclide inventory determined by a segmented gamma scanner, and placed back into 'transfer' storage (long-time interim storage until max. 2030) in a way that will enable individual drum inspection and retrieval. Because of the lower drum packing density, the capacity of the 'transfer' storage, including the rededicated reactor building, will decrease to 12,000 200-litre-drums.

Radioactive waste that will eventually result from the decommissioning of the TRIGA Mark II research reactor in Vienna might necessitate an expansion of the existing interim storage facilities.

Storage halls

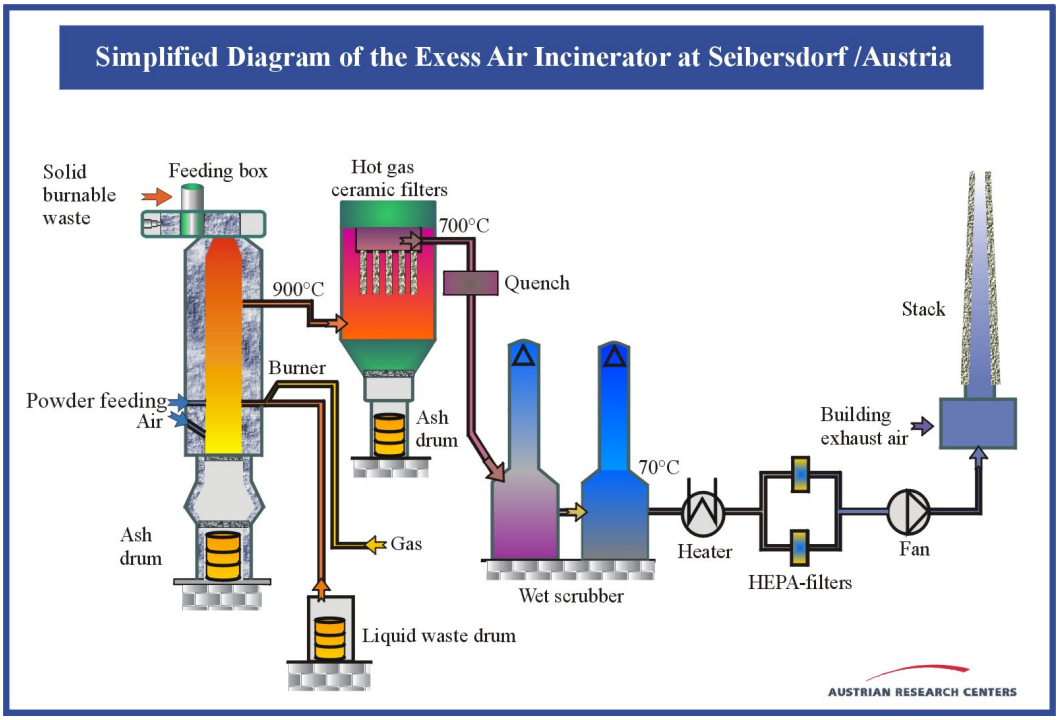
Conditioned waste in interim storage hall 12A

Incinerator

The shaft incinerator of the “Karlsruhe” type is an excess air unit having a capacity of about 40 kg per hour and a combustion volume of 1 m diameter and 5 m height. The off-gas cleaning system consists of a set of ceramic hot gas filters, quench, two stage wet scrubber and HEPA-Filters.

Over the years a number of modifications to the original design have been carried out in order to improve safety, to keep up the technical standard and to meet requirements of changing regulations. Especially the off-gas cleaning system has been changed considerably compared to the original design.

In addition, modifications to the shaft have been carried out too, where for example additional openings were introduced in order to facilitate effectively the incineration of powdery material. A project of incinerating about 1000 tons of ion-exchange resin had been successfully carried out, where the dried material was transferred into the combustion chamber via a screw and a blowing system. After completion of the project, the conditioned ash was sent back to the country of origin.



Simplified Diagram of the Excess Air Incinerator

Technical data of the incinerator:

- Excess air incinerator
- Shaft type, single chamber
- Combustion chamber: 1 m diameter, 5 m high
- Combustion temperature: 1000 °C
- Capacity : ~ 40 kg / h solid burnable waste (calorific value: average 21×10^6 J/kg = 5000 kcal/kg)
- Underpressure in the combustion chamber: 10^3 Pascal = 10 mbar
- Air flow: 300-600 m³ variable, depending on underpressure in combustion chamber
- Feeding from top batch wise (2-3 kg) through airlock, liquids through burner
- Feeding of powdery material by blowing system into combustion chamber
- Hot gas filter, in brick-lined filter box, Silicon-carbide candles, mean porosity : 20 µm
- Quench, spray cooler with nozzles, decreases off-gas temperature from 700 °C to 70 °C
- Two stage scrubber (one trickle flow, one spray) using caustic soda solution to pH 8.1
- Heater, raises off-gas temperature to ~ 100 °C
- HEPA filters
- Off-gas draft fan, radial blower, regulated by underpressure of combustion chamber
- Mixing chamber

- Stack, 35m high

Operational experience

During 22 years of operation the following amount of waste has been treated:

- liquid waste 48 t
- solid waste 702 t
- ion exchange resins 535 t (after drying)

The ash of that resins were conditioned and sent back to the country of origin.

By the end of 2004 a total of about 1300 tonnes were combusted.

Depending on the amount of radioactive waste to be combusted the incinerator was operated to the number of shifts necessary for the planned quantity every year. The plant was operated for some 46 000 hours in total until the end of 2004. It is operated in two shifts a day, i.e. from 6h00 till 22h00 6 days a week, with two operators in one shift.

The treatment of these wastes resulted in a volume reduction of about 50:1 comparing row material to ashes. But operating such a facility creates secondary waste, changing the picture of volume-reduction significantly. Apart from operational waste as hot gas- and HEPA-filters, contaminated parts from maintenance and repairs a number of replacements have to be included. For example the removal of an electrostatic filter originally installed at the off-gas cleaning system, renewal of refractory-brick lining of the lower half of the combustion chamber after 12 years of operation and a part of the refractory-brick lining in the hot gas filter boxes, renewal of HEPA-filter boxes, replacement of parts of piping and other equipment.

Activity releases to the atmosphere

Radioactive releases to the atmosphere are checked by analyses of samples collected in a sampling system connected to the stack. Release limits are radio nuclide specific and set by the authority.

In total the following radioactive releases have been determined during 22 years of incinerator operation:

α [MBq]	β [MBq]	^{60}Co [MBq]	^{137}Cs [MBq]
11,5	77,8	< 25,0	< 25,4

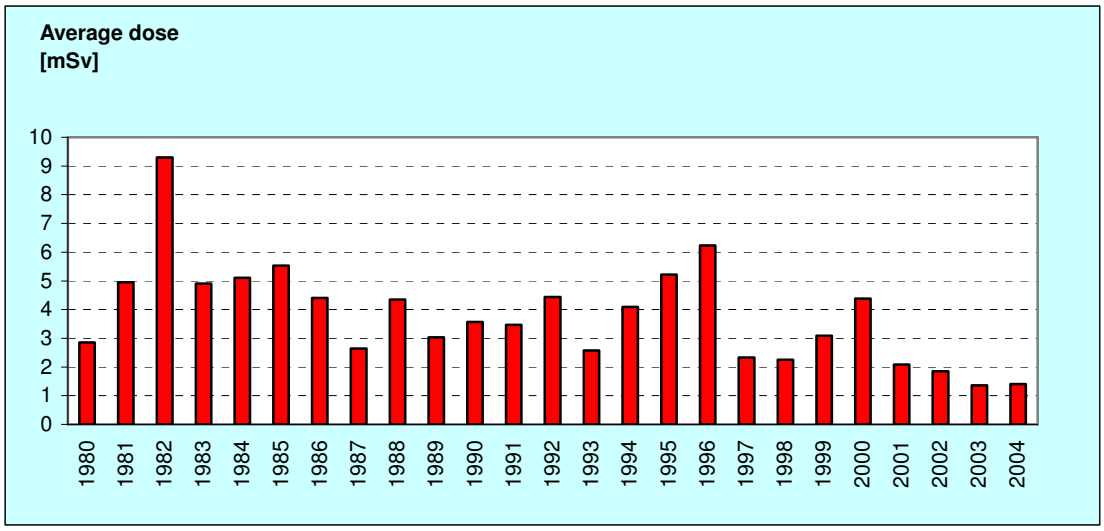
Activity throughput

Apart from specific experiments, when waste with known radio nuclides and known activity was fed to the incinerator in order to find out retention factors, it was not possible to obtain an activity balance or a decontamination factor at treating institutional wastes by activity measurements of ashes, hot-gas filter, HEPA filter and waste water.

The activity of institutional waste is very low. Due to the characteristics of that waste, routine measurements and reported activity values of the row waste are very inaccurate. So, the activity of waste fed into the incinerator is badly known and, cross contamination within the incinerator unit causes an additional problem, i.e. the surfaces of the plant exposed to the off-gas adsorbs radioactive particles from the passing off-gas and simultaneously releases such particles into it. These factors together indicate that activity balancing is nearly impossible.

Radiation exposure to staff

Staff working at the incinerator is not only acting as operators during incineration campaigns but also responsibly for maintenance checks and repairs at the incinerator system. In addition it is partly engaged in handling and segregation of radioactive waste prior to its combustion. This must be taken into account, when considering radiation doses to personnel.



Average dose to the staff of the Seibersdorf waste treatment facilities

All readings are derived from Thermo-Luminescence Dose meters (TLD).

No single person of the staff involved in handling and incinerating of radioactive waste ever had a radiation dose in excess of the limits set in the relevant regulations.

L.2 Decommissioning of the ASTRA Reactor at Seibersdorf

After 39 years (1960 to 1999) of successful operation, the 10 MW multipurpose MTR research reactor ASTRA at the Austrian Research Centers Seibersdorf (ARCS) is in the state of decommissioning since 2000. An immediate dismantling to stage 1 of the IAEA technical guide-lines (storage with surveillance, final shipment of spent fuel and thus complete removal of high-level waste from the site) followed.

Licensing procedure for the decommissioning the ASTRA reactor

a. Application for modification of the operating licence (=decommissioning of ASTRA)

According to § 17 of the Act on the Environmental Impact Assessment 2000 Nuclear Engineering Seibersdorf GmbH (NES) issued an application including a comprehensive environmental impact declaration.

b. Positive licensing notification

12 comprehensive experts' reports have been issued on behalf of the competent authority by a range of experts, evaluating the possible environmental impacts of the decommissioning project. After the information and involvement of the public the Office of the Provincial Government as the competent authority issued the requested licence for decommissioning the ASTRA Research Reactor. This notification was made available for public inspection by the competent authority and by the local authority, including several conditions regarding to waste chemistry, site engineering, fire – and radiation protection requirements:

c. Inspections

After completion of the project a technical approval by the authority have to take place. According to the law an inspection has to be carried out 3-5 years after the completion of the project that was subject of the EIA. In addition annual inspections based on the Radiation Protection Act are carried out by the Head of the Provincial Government of Lower Austria as competent authority.

d. Appeal procedure

The concerned parties had the right to appeal against the licensing notification of the EIA authority to the Independent Administrative Senate set up by the Federal Ministry of Agriculture, Forestry, Environment and Water Management. Concerned parties were

- neighbours, if jeopardized by the projects commissioning,
- the parties designated by the appropriate administrative regulation,
- the Environmental Ombudsman,
- the local community and the neighbouring communities,
- Citizens' initiatives.

A special appeal to the administrative and the constitutional court was also possible.

Conditioning of radioactive waste management

An evaluation of the expected amount of radioactive waste was performed which showed that it would amount to approximately 320 kg of intermediate-level waste (ILW), about 100 t of activated low-level waste (LLW) and about 60 t of contaminated LLW.

The high-level waste (HLW) and ILW could be removed under the valid operating license of the reactor. According to EU-law, for the removal of the rest of the activity (which amounts to less than 0.001% of activity one week after the final shutdown) an environmental impact assessment (EIA) was required. The option to start work on stage 1 under the existing operat-

ing license gave the necessary time to prepare and carry out the Environmental Impact Assessment (EIA).

Material that will have to be conditioned and stored includes approximately 10 tons of reactor-grade graphite from the inner and outer thermal columns as well as from old-type reflector elements as used between 1960 and 1970 and moderators from late experiments. Over the 40 years of reactor operation, some of the graphite had been exposed to an estimated integrated fast-neutron flux of up to 1.7 x 10^{20} n/cm^2. Since the temperature of the graphite never exceeded 100° C, annealing of lattice defects did not occur and the accumulation of significant amounts of Wigner energy did occur.

Work under stage 1

The 54 MTR-fuel elements (310.5 kg of HLW) were shipped to US-DOE Savannah River Plant for ultimate disposal in May 2001. In immediate succession and still under the operating license, all experimental facilities and components of the reactor within the vicinity of the core or in intermediate storage within the building i.e. old beam-tube-inserts, 492 kg of ILW and 5212 kg of LLW were removed and treated. In the course of this procedure custom-designed, remote-controlled equipment had to be built and three GNS-Mosaik containers were filled, partly under water, with the remaining material. Also the task of clearing the reactor building from remaining experimental equipment, obsolete storage facilities and the transfer of the structures of the industrial source services including a 21-ton-lead-cell to Nuclear Engineering Seibersdorf GmbH (NES) Hot Cell Laboratories were accomplished to 90% under this stage. Work under stage 1 ceased by May 2003.

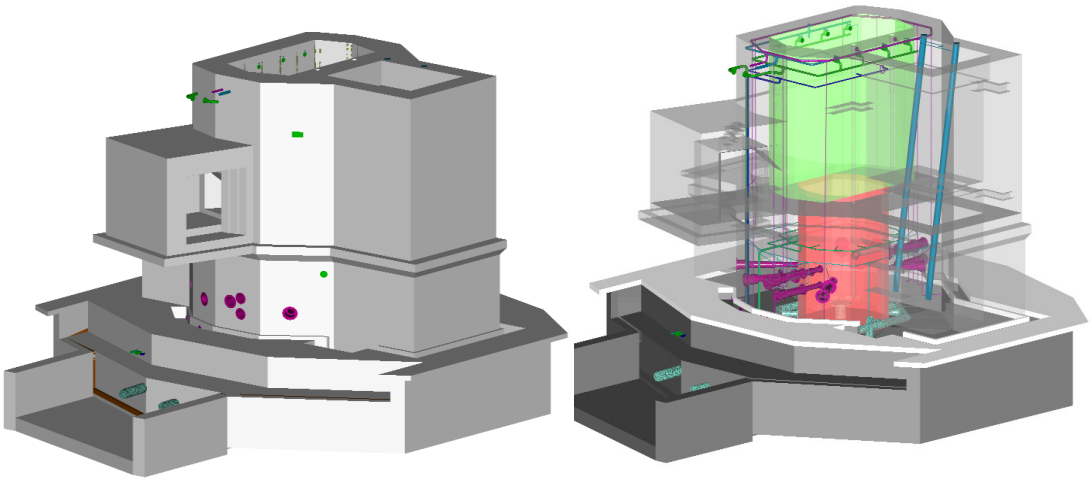
Conditioning of ILW - Under water loading of GNS-Mosaik Container

Work under stage 2

During 2002 the EIA (Environmental Impact Analysis) was prepared. The public hearing was held on December 19th, 2002 and was followed by a license to decommission on April 8th, 2003.

Dismantling of the Biological Shield

To reach a decision on dismantling techniques to apply at the materials of the activated and the inactive zone an extensive sampling program started immediately after the decommissioning license was granted.



3D-study, Biological shield of the ASTRA reactor

To take down the inactive structures of the biological shield (400 m^3 of reinforced Barite-concrete totalling to approx. 1400 tons, several techniques were under discussion. Finally, dividing the biological shield into blocks of between 7 and 9 tons (limited by the 10-ton-capability of the crane) applying wire cutting techniques was chosen as the most promising method under ASTRA auspices. There were several advantages in preferring wire cutting:

- Measurements and calculations have shown that the risk for spreading contamination due to cutting was almost none existent. Since wire cutting needs a lot of water, no dust would occur, an already considered, expensive housing was obsolete.
- Work could be done with a minimum of manpower, only two extern experts were needed for the handling of the cutting equipment, usually supported by two co-workers and one supervisor of the decommissioning crew, mainly responsible for the controlled gathering of the sludge.
- Last but not least, the possibility of applying surface measurements with higher sensitivity compared to the traditional in-barrel technique should guarantee levels of clearing up to the standards of re-use.

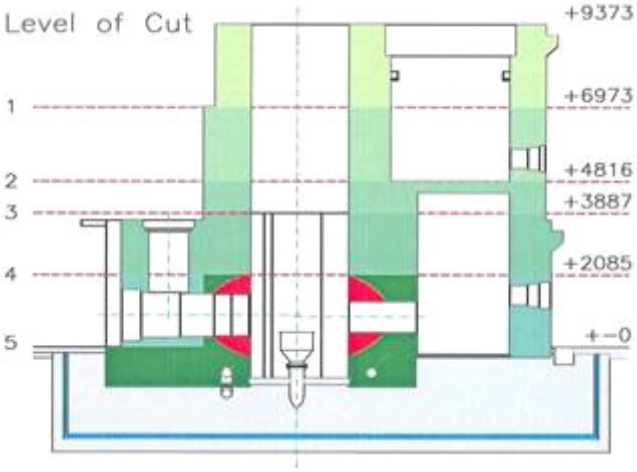
In order to obtain sufficient data giving a clear picture of the sensitivity of surface measurement, a Canberra ISOCS device was evaluated with positive results. A program for additional intern probing and examining of embedded tubes completed the efforts to prove clearance. The process was presented to and accepted by governmental experts in due time.

A building directly attached to the reactor was erected to give ample room for clearance measurements and clearance procedures. The ISOCS device was mounted to custom designed gimbals travelling along horizontal and vertical guide rails. All surfaces of the blocks can be reached with a minimum of crane work. Applied measuring started by April 2004. By the end of 2004 approximately 100 blocks totalling 600 metric tons (roughly 50% of the total) were cleared.

An area of the reactor basement under the remains of the sectional floors was modified to an enclosed and separately ventilated working area equipped with stationary cutting and shearing equipment for the preconditioning of contaminated metals from the dismantling of the primary water installations, transferred from the pump room within closed steel containers.

The liner of the tank was removed to a level 3 meters below the upper floor. After gaining some experiences with wire cutting, at the lower levels, aluminium and other metal structures on some surfaces were cut in the same process while cutting the barite concrete, significantly reducing the efforts necessary to remove the partly embedded metal structures in situ.

In preparation of the cutting work on the biological shield working platforms were installed in the pool and in the upper hot cell. Additional measures were taken to control the drain of the cutting fluid and to remove concrete and steel particles from the solution. Calculations show that about 25 tons of cake is to be expected, which should be inactive waste by definition. Therefore careful collection and preparations to achieve clearance is essential to prevent contamination and/or cross contamination.



Dismantling of the biological shield:
Layers designated for cutting *Removing of blocks*

Actual cutting started in February 2004. In consideration to the sections in which the biological shield was originally moulded, a top layer with a vertical extension of 2.4 meters was divided into 33 blocks. The cutting of level 1 was completed on the 16th of March 2004. After removing and clearing the blocks cutting on level 2 with a vertical height of 2.15 meters was resumed in June 2004 producing another 43 blocks. By end of September 2004 cutting at level 3 with a vertical extension of only 0.94 meters (14 blocks) took place. The collection and clearance of the cake was successfully achieved.

Due to the precautions during the cutting process followed by intensive clearance procedures, all barite concrete blocks so far could be released to a level sufficient for “buildings for re-use” after minor mechanical treatment. The cleared blocks were transferred into a deposit specialized for recovered building materials and stored in a marked area with the intention of later recycling.

Results obtained by probing the shield in a vertical pattern allow for another cut at level 4, 1.8 meters below level 3 together with the reduction of the structures of the lower hot cell and the outer thermal column to ground level (level 5). Cutting at level 4 was completed by the end of February 2005. In September 2005 the dissecting and complete removal of the activated parts of the biological shield has been completed.

Processing of Contaminated and Activated Metals

Parallel to the removal of the biological shield, dismantling of the primary and secondary water installations in the pump room was initiated. The pump room is situated separately from the reactor in a two-storey underground building. Therefore and prior to dismantling, preparations to the building were necessary which were completed by the end of March 2004. Additionally, economical methods for cleaning and for radiological identification of the metals to be removed had to be developed.

Removing the electrical installations in the pump room took place during May 2004. Thereafter, at the first stage, the potentially inactive components of the secondary water systems were removed. At a second stage, initiated during June 2004 and still under way, dismantling of the structures of the primary water systems took place.

In order to reduce the amount of estimated 60 tons of slightly contaminated metals, it was determined, that introducing re-melting procedures would be the most economical way. Since the amount of material would not justify the development of local facilities, contacts with potential European bidders were initiated.

Handling and Conditioning of the Beryllium Reflector Elements and Hf Control Rods

Another subject is the conditioning of the ASTRA Beryllium reflector elements. The conditioning will again be undertaken at the hot-cell facility. For this purpose, individual containers for each element were designed from high-grade stainless steel, a remote- controlled orbit welding facility was modified and adapted and hot cell No. 6 underwent general restoration to be able to handle the work.

Two GNS-Mosaik containers have been readied to store the ^{18}Be-reflector- and the ^{7}Be-radiation elements together with the active blades of the ASTRA Hf-control rods. The Be-elements and the blades of the control rods are finally to be stored in sealed condition.

So for permanent save storage of the intermediate level waste due to decommissioning of the ASTRA altogether five GNS-Mosaik containers were needed.

Work in progress under stage 2 in 2006

Radiological clearing of the remaining materials and dismantling of the primary and secondary water tanks in the pump room will continue. Having removed the biological shield and some of the embedded primary tubing, dismantling the ventilation system is the next step. Clearing of the reactor buildings is scheduled to start in January 2006 concerning the pump room to be followed by the clearing of the actual reactor building early in 2006. From today's point of view and based on a rough estimate the project is expected to be completed in June 2006, which is about 6 months later than the original plan. The project's final goal is the release and re-use of the buildings. Re-use is already in the stage of detailed planning (see Annex L.3).

L.3 Re-Use of the ASTRA-Research Reactor Buildings

The ASTRA reactor at the Austrian Research Centers Seibersdorf is under decommissioning since 2000.

It was decided to immediately dismantle the reactor to a preliminary stage (storage with surveillance, final shipment of spent fuel and thus complete removal of high-level waste from the site) followed by total dismantling and re-use of site At the moment the removal of Low-Level Waste (LLW) is under way.

Prior to the final shut-down on July 31st, 1999, the possible options and the required stages for decommissioning and removal of the radioactive components were evaluated and appropriate financial provisions were arranged. (See IAEA TRS #420, Transition from Operation to Decommissioning of Nuclear Installations, 2004)

Re-use Concept of the Reactor Building after Decommissioning.

In the decommissioning plan of the ASTRA, some thought was given to the subject of re-use of the infrastructure. Several suggestions were presented, including a proposal to use the buildings as an international trainee centre to first responders. Finally and for reasons as stated below, it was decided to use the structures for purposes directly connected with responsibilities as designated to the later Nuclear Engineering Seibersdorf GmbH (NES).

NES radioactive waste storage capacity until 2015 is designed for a calculated quantity of 15000 200-litre-drums of conditioned radioactive waste. On its premises there is only adequate room for approximately 9500 drums stored in transfer configuration (access and inspection to every single drum possible). For practical and economical reasons the adaptation of the cleared reactor building would give additional room for another 5500 drums at three upper levels. A new building has been erected attached to the rear entrance of the reactor, already needed for the extensive clearance measurements during the decommissioning process, in order to provide a safe and roofed entrance to the storage, using only a small portion of the ground floor of the former reactor building to give necessary access.

The rest of the ground floor could be developed into an active working area, replacing the then decommissioned the hot-cell facility. The guided entrance to the former reactor with the facilities covering health physics, measuring equipment and personnel facilities could be put to new use. Auxiliary buildings directly attached to the reactor could, with minor modifications, house the necessary ventilation and filtering systems to serve the low pressure area of the work room.

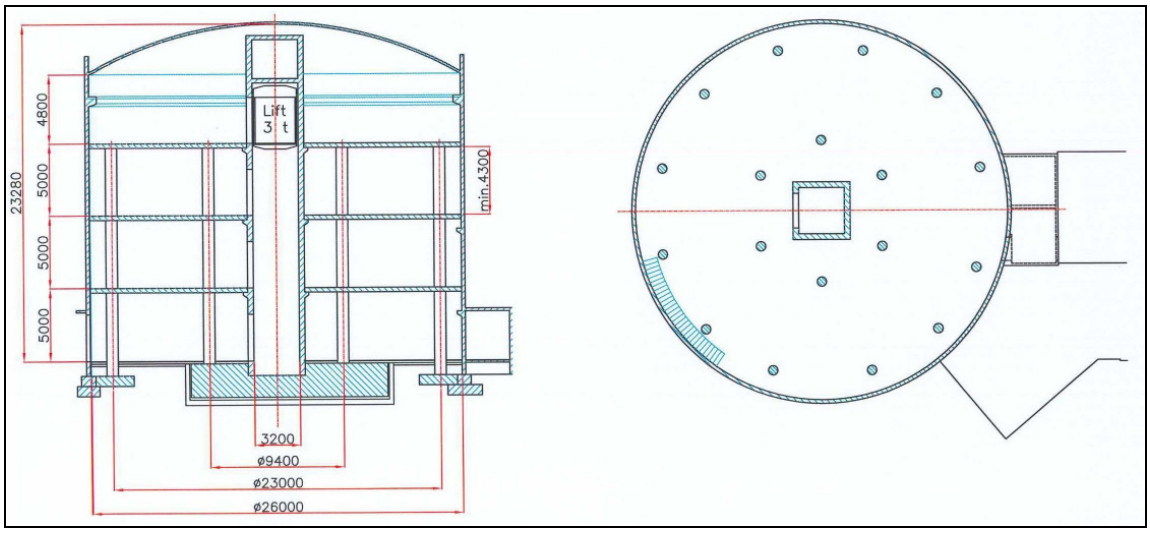
In addition, younger personnel remaining, with a reactor operator's background, experienced in engineering and handling of radioactive materials, with knowledge in hot cell work, as well as an already established group managing the industrial radioactive source service, would be well equipped to operate the new facility.

Last not least, the area of the former reactor is directly connected to the area of RMWD.

Necessary Alterations to the Buildings

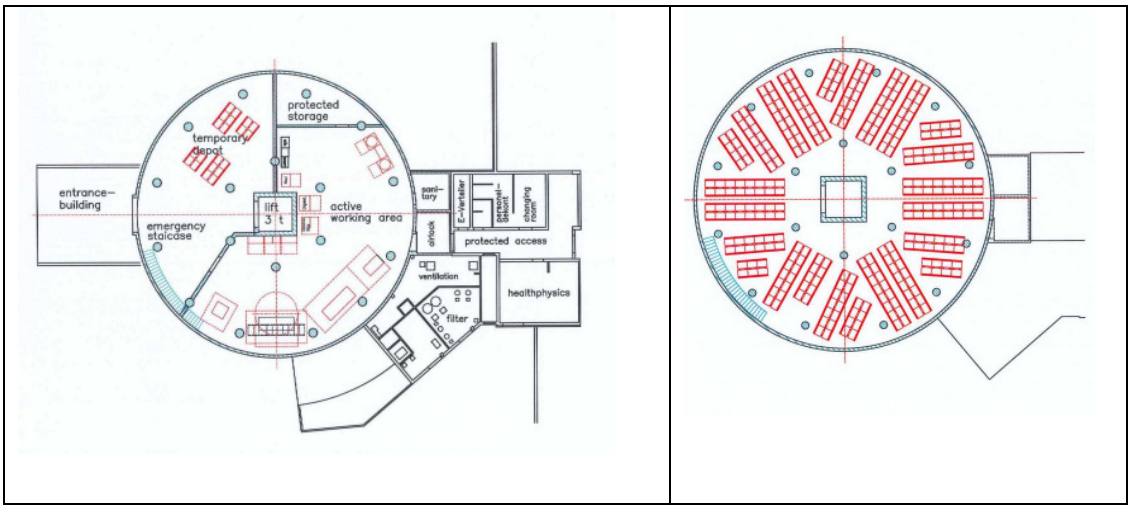
After decommissioning a cylindrical building 26 meters in diameter and with 21 meters of height with all internal structures removed and cleared for unrestricted use will remain. After removing the floor between the heavy foundations of the former pool and the outside walls a new circular foundation along the base of the building will be erected. A new ground floor of 0.7 meters reinforced concrete covers the ground between outer and central foundations.

Twelve pillars on the outer perimeter and another six pillars along an inner perimeter carry three floors with a load capacity of 800 metric tons each. In the centre of the building an elevator with 3 tons capacity gives access to the three upper levels. Further instalments involve a simple ventilation system and the necessary lighting. No heating is required. A staircase will be installed for emergencies.



Modifications to the building

The ground floor will be divided into two areas by radial walls. The smaller portion at the side of the former rear entrance and accessible via the newly erected hall is for manipulations connected to the operation of the LLW-storage facilities. The remaining larger area will be equipped for hot work. It is accessible via the original air lock and will be adapted for low pressure. The new ventilation system can be housed in the attached auxiliary buildings. Heating and electrical installations complete the interiors. Part of the working area will be separated with a wall functioning as a safe storage for sensible materials with all the security necessary.



Layout ground floor *Layout upper levels*

The former, heavily shielded valve pit and the former storage facilities for beam tube experiments can be adopted as storage for high activity sources. The lead cells of the industrial radioactive source services and other equipment from the hot-cell facility are going to be installed.

The three upper levels of the building with access through the newly erected entrance building, the former rear entrance of the reactor and via the 3-ton-elevator within the centre of the building shall be used to house part of the transfer storage. LLW-waste conditioned into 200-litre-drums are to be stored on crates holding 2 drums at a time and to be stacked to a total height of six. The arrangement of the stacks takes into account easy accessibility for inspection.

L.4 EU-SAPIERR-Project

The SAPIERR project (Support Action: Pilot Initiative for European Regional Repositories) where 21 European organizations from 14 countries are participating has been carried out as part of the Specific Support Action of the 6th EC Framework Programme and serves to generate and support European research areas.

The Project was started on 1st December 2003. The duration was 2 years.

The Federal Ministry of Agriculture, Forestry, Environment and Water Management suggested to the project executing organizations DECOM Slovakia and ARIUS that Nuclear Engineering Seibersdorf GmbH (NES) takes part in the SAPIERR working group. According to the Austrian Radiation Protection Act, the possibility of cooperation with other EU Member States or other Contracting Parties to the Joint Convention has to be taken into account regarding radioactive waste management comprising pre disposal treatment and final disposal in order to follow the principles of risk balance, optimization of radiation protection and cost minimization A corresponding agreement was undersigned between DECOM Slovakia and Nuclear Engineering Seibersdorf GmbH (NES).

The project managed by the consortium composed of DECOM Slovakia and Arius deals with questions of multinational co-operations aiming at finding suitable regional or international repository solutions and working out uniform procedures. Particular importance is attached to the collection of information on waste inventories, legal aspects and on the specific situation in the participating countries.

The SAPIERR project consisted of the following work packages:

1. Data gathering & analysis
2. Scenarios & RTD requirements
3. Working Group meetings
4. Information dissemination
5. Management activities

Of particular importance for Austria was the exchange and collection of information on:

- Identification of amounts, types and times of arising of wastes waste (considering all wastes which require geological disposal). Main emphasis however is placed on spent fuels and highly radioactive wastes.
- Identification of possible regional repository and disposal concepts in Europe.
- Identification of most interesting final repository concepts and proposals for future priorities and relevant studies.
- Identification of new transnational RTD requirements
- Proposal of mechanisms for the development of strategic options and RTD requirements in future EU programmes.
- Cost estimates and preparation of a database for regional waste management in Europe.

The participation of Austria in this project aims at delivering a valuable contribution to the project and at providing the results of the project to the Federal Ministry of Agriculture, Forestry, Environment and Water Management as Austria's responsible authority for the questions of future final repository of radioactive waste.

L.5 References to National Laws and Regulations

Legislation (Acts and Ordinances)

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[i] **Constitutional Law on a Non-Nuclear Austria** ("Bundesverfassungsgesetz für ein Atomfreies Österreich") of August 13th, 1999, Federal Law Gazette I no. 149/1999.

[ii] **Radiation Protection Act** ("Strahlenschutzgesetz - StrSchG") of June 11th, 1969, Federal Law Gazette no. 227/1969, as amended by the Radiation Protection EU-Adaptation-Act 2002 of August 20th, 2002, Federal Law Gazette I no. 146/2002 and by the Radiation Protection EU-Adaptation-Act 2004 of December 10th, 2004, Federal Law Gazette I no. 137/2004.

[iii] **General Radiation Protection Ordinance 2005** ("Allgemeine Strahlenschutzverordnung – AllgStrSchV) - not yet published up to the time of drafting the Austrian National Report 2006.

[iv] **Ordinance on the Supervision and Control of Shipments of Radioactive Waste into, out of and through Austria** ("Radioaktive Abfälle-Verbringungsverordnung") of March 1st, 1997, Federal Law Gazette No. 44/1997, implementing Council Directive 92/3/EURATOM of 3 February 1992 on the Supervision and Control of Shipments of Radioactive Waste into, out of and through the Community".

- **Medical Radiation Protection Ordinance 2004** ("Medizinische Strahlenschutzverordnung-MedStrSchV"), Federal Law Gazette II no. 409/2004.

[v] **General Administrative Procedures Act 1991** („Allgemeines Verwaltungsverfahrensgesetz 1991 - AVG"), Federal Law Gazette no. 51/1991.

[vi] **Act on Liability for Damage Caused by Radioactivity 1999,** ("Bundesgesetz über die zivilrechtliche Haftung für Schäden durch Radioaktivität, Atomhaftungsgesetz-AtomHG 1999"), Federal Law Gazette I no. 170/1998, as amended.

- **Nuclear Non-Proliferation Act 1991** ("Sicherheitskontrollgesetz 1991"), Federal Law Gazette no. 415/1992, as amended.

[vii] **Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation,** Official Journal no. L 159/1 of 29 June 1996.

[viii] **Act on the Enforcement of Administration Decisions 1991,** („Verwaltungsvollstreckungsgesetz"), Federal Law Gazette no. 53/1991, as amended.

[ix] **Convention on Early Notification of a Nuclear Accident**, INFCIRC/335, 18 November 1986**.**

[x] **Council Decision 87/600/Euratom on Community arrangements for the early exchange of information in the event of a radiological emergency** of 14 December 1987, Official Journal no. 371/79 of 30 December 1987.

[xi] **Environmental Impact Assessment Act 2000**, („Bundesgesetz über die Prüfung der Umweltverträglichkeit, Umweltverträglichkeitsprüfungsgesetz 2000 - UVP-G 2000"), Federal Law Gazette no. 697/1993, as amended.

[xii] **Environmental Management Act**, ("Umweltmanagementgesetz"), Federal Law Gazette I Nr. 96/2001 as amended by I no. 99/2004.

[xiii] **Council Regulation (EURATOM) No 1493/93 of 8 June 1993 on shipments of radioactive substances between Member States**, Official Journal of 19 June 1993 No L 148/4.

[xiv] **Council Directive 92/3/EURATOM of 3 February 1992 on the supervision and control of shipments of radioactive waste between Member States and into and out of the Community**, Official Journal of 12 February 1992 No L 35/24.

[xv] **Act on the Transport of Hazardous Goods** ("Bundesgesetz über die Beförderung gefährlicher Güter und über eine Änderung des Kraftfahrtgesetzes 1967 und der Straßenverkehrsordnung 1960 - Gefahrgutbeförderungsgesetz –GGBG"), Federal Law Gazette I no. 145/1998.

[xvi] **Inland Navigation Ordinance („**Verordnung des Bundesministers für Wissenschaft und Verkehr über die Beförderung gefährlicher Güter auf Wasserstraßen - ADN-Verordnung"), Federal Law Gazette II no. 295/1997, as amended.

[xvii] I**nland Navigation Act** („Bundesgesetz über die Binnenschifffahrt – Schifffahrtsgesetz"), Federal Law Gazette I no. 62/1997, as amended.

• **Labour Inspection Act** („Bundesgesetz über die Arbeitsinspektion-/Arbeitsinspektionsgesetz 1993 – ArbIG"), Federal Law Gazette no. 27/1993.

Obtainable from:

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