SWEDEN

[Reference Date: 31.12.2013]

A. National Framework for Management of Spent Fuel and Radioactive Waste

Sweden has been using nuclear produced electricity from Swedish reactors as part of the energy mix since the early 1970s. Nuclear power companies are obliged to manage their radioactive waste as well as to bear the associated costs.

Today, Sweden has an effective system for taking care of this nuclear waste. Since the mid-1980s, facilities have been in operation for final disposal of short-lived operational waste (SFR) and interim storage of spent nuclear fuel (Clab). Since the 1970s, the Swedish Nuclear Fuel and Waste Management Company (SKB) has also worked on development of a method for safe management and disposal of spent nuclear fuel.

In March 2011, licence applications under the Nuclear Activities Act and under the Environmental Code were submitted by SKB concerning a system for encapsulation and disposal of spent nuclear fuel. The application under the Nuclear Activities Act is being reviewed by SSM, and the application under the Environmental Code is being reviewed by the land and environmental court in preparation for the Swedish Government's decision concerning permissibility under the Swedish Environmental Code and a licence under the Act on Nuclear Activities. Statements on the applications are planned to be submitted to the Government in 2017. In December 2014, SKB also submitted an application for a license regarding an expansion of SFR for final disposal of decommissioning waste.
Radioactive waste is also generated during different stages of industrial, agricultural, medical and research work. There are thousands of operations and activities using unsealed and sealed radiation sources. Under the Radiation Protection Act, the operator of activities involving radiation sources is also responsible for final management of this waste. Most disused sealed sources are either returned to the manufacturer or managed by Studsvik Nuclear AB.

Fundamental principles for management of spent nuclear fuel and radioactive waste have evolved in pace with the emergence of the Swedish nuclear energy programme. Against the background of the 1970s' nuclear energy debate, several decisions in principle were taken on the political course and corresponding amendments were implemented in the legislation.

The fundamental principles as per below have been implemented in the legislative framework:

- Costs for the management and disposal of spent fuel and radioactive waste from nuclear activities shall be covered by fees that licensees are required to pay.
- The licensees are to safely dispose of spent nuclear fuel and radioactive waste from nuclear activities.

- The state has the ultimate responsibility for spent nuclear fuel and radioactive waste from nuclear activities.
- Each country is to be responsible for the spent nuclear fuel and radioactive waste generated from nuclear activities in that country.

Implementation of these basic principles for management and final disposal of spent nuclear fuel and radioactive waste in the Act on Nuclear Activities and Radiation Protection Act also implies fulfilment of the 'Polluter Pays Principle' principle of the Environmental Code).

The political orientation vis-à-vis management of spent nuclear fuel is direct final disposal without reprocessing. Thus, the spent fuel is in practice managed as radioactive waste.

The legislation clearly points out the operator as being primarily responsible for the safety of spent fuel and radioactive waste management. This obligation signifies an extensive commitment on the part of a licensee. Not until the waste is disposed of in a repository that is finally sealed can the Government discharge the waste producer from its liability and the long-term liability will rest with the State.

Parties licensed to own or operate a nuclear power reactor are subject to a particular obligation to carry out the following in consultation with other licensees of nuclear power reactors:

- Preparing a programme, either in-house or by a third party, for the comprehensive research, development and demonstration work and the other measures necessary for safe management of nuclear waste and spent nuclear fuel, in addition to safe decommissioning and dismantling of nuclear facilities (i.e. the RD&D programme), and
- producing a cost estimate as input for calculating the fees to be payable to the Nuclear Waste Fund to cover the cost for the management of nuclear waste and spent fuel and for the decommissioning.

The reactor licensees established SKB as a jointly owned company to execute their tasks, i.e. preparing and submitting to the Authority the nuclear power industry's joint RD&D programme and cost estimate. Today, SKB is also the licensee responsible for all handling, management, transports and interim storage of spent nuclear fuel and nuclear waste outside the nuclear power facilities, including Clab and SFR's operations.

SKB's application for a spent nuclear fuel repository is based on the conceptual design of a deep geological repository having passive safety systems. The repository's design must have resilience against conditions, events and processes that can lead to the spreading of radioactive substances. This is to be achieved in the form of a system comprising several passive barriers whose function is to contain, prevent and impede the spreading of radioactive substances prior to and after closure of the repository.

By means of communication and transparency, SSM contributes towards public insight into all operations encompassed by the Authority's mandate. The general public's opportunities for effective participation as part of the decision-making process for management of spent nuclear fuel and radioactive waste are, for instance, ensured by their potential involvement in

a consultation procedure required within the Authority's review of the RD&D programme and cost estimates. This means that special interest groups are involved in the pre-licensing phase of nuclear facilities. Furthermore, an environmental impact assessment (EIA) must be produced. It must contain a formal plan for the consultation process with relevant interested parties prior to a licence application. A special-purpose solution for financing also ensures that non-profit associations can actively take part in the consultation process for a spent nuclear fuel repository. This has contributed immensely to the level of quality, openness and insight in this process. What's more, the right of municipal authorities to exercise a veto at community level means that local residents prevent the establishment of undesired nuclear activities in their area. This factor is of great significance when it comes to the general public's confidence in the licensing process.

Nuclear activities must be run in a way so that the quantity of nuclear waste and its content of radioactive substances are limited as far as reasonably possible. Optimisation and applying best available technique are to characterise final management of spent nuclear fuel and nuclear waste. Non-nuclear activities are subject to the provisions of the Swedish Environmental Code on promoting sustainable development, reuse and recycling, as well as other conservation of materials, commodities and energy.

B. National Legal and Regulatory Framework

The role of central government authorities is to ensure compliance with legislation and rules. Swedish authorities have an independent role and extensive powers to determine how their own tasks are to be performed. The authorities are also autonomous as part of their exercise of public power in relation to individuals and in the context of applying legislation. This independence is a crucial component of the Swedish model, which contributes towards public administration that is efficient, effective and follows the rule of law.

SSM is the Government's administrative authority responsible for areas concerning the protection of human health and the environment against the harmful effects of ionising and non-ionising radiation, issues concerning safety, security and physical protection in nuclear and other activities involving radiation and also matters concerning nuclear non-proliferation. SSM's tasks include the following:

- promoting radiation safety in society;
- working for prevention of radiological accidents;
- ensuring safe operation and waste management as part of nuclear activities;
- minimising the risks posed by radiation used in medical applications and optimising these outcomes;
- minimising the risks posed by radiation used in products and services, or which arise as a side effect when using products and services;
- minimising the risks posed by exposure to naturally occurring radiation; and
- help improving radiation safety internationally.

The framework of Swedish legislation in the areas of waste management, nuclear safety and radiation protection consists of four principal enactments with appurtenant ordinances:

- The Act on Nuclear Activities;

- the Radiation Protection Act;
- the Swedish Environmental Code;
- the Act on Financial Measures for the Management of Residual Products from Nuclear Activities; and

The general principles governing safety and radiation protection are defined in the Act on Nuclear Activities, Radiation Protection Act and Environmental Code. The provisions contained in these enactments are supplemented by ordinances and regulations containing more detailed provisions.

The Act on Nuclear Activities contains the fundamental conditions pertaining to safety in connection with nuclear activities, and encompasses not only management of nuclear material and nuclear waste, but also operation of facilities. The stipulated objective of safety work is to as far as possible eliminate the risk of a radiological accident and thus, ultimately, the loss of life and property. This is why the Act on Nuclear Activities has been formulated to give licensees a virtually strict liability when conducting nuclear activities. The Act contains the key provisions governing management and final disposal of nuclear waste and spent nuclear fuel.

The purpose of the Radiation Protection Act is to protect people, animals and the environment against harmful effects of both ionising and non-ionising radiation. It is a general safety enactment that basically encompasses all operations relating to aspects of radiation protection, such as medical services, research work and other non-nuclear industry. Thus, the Act also regulates important aspects of radiation protection in connection with work in the field of nuclear energy. The Radiation Protection Act is a key enactment for protection of workers engaged in operations involving ionising radiation. Parties conducting activities involving radiation are also responsible for ensuring that the radioactive waste occurring in their operation is managed and disposed of in a way that is satisfactory from the standpoint of radiation protection. This responsibility includes covering costs related to both management and storage of this waste.

The purpose of the Swedish Environmental Code is to protect the environment and human health against environmentally hazardous activities and to promote sustainable development implying that present and future generations are ensured a healthy and sound environment. Nuclear facilities and certain complex facilities whose work involves radiation are to be viewed as operations that are environmentally hazardous and thus subject to the rules of the Code. Under the Code, SSM is the supervisory authority when it comes to detriment due to ionising and non-ionising radiation from nuclear activities and practices involving radiation that also require a licence according to the Code's rules. SSM is also tasked with giving guidance as part of County Administrative Board and municipal supervisory work relating to areas contaminated by radioactive substances.

The Financing Act contains provisions on defraying future costs for disposal of spent nuclear fuel as well as decommissioning, dismantling and demolition of nuclear power plants and other nuclear facilities. A party licensed to own or operate a nuclear facility must pay fees to the state, which reserves the assets in the Nuclear Waste Fund. Licensees also have an obligation to pledge assets as collateral for costs not covered by the fees. The purpose is to, as far as possible, minimise the risk of the state being forced to bear the types of costs encompassed by the licensees' payment liability.

In order to conduct nuclear activities or extensive operations involving radiation, licences are required under the Act on Nuclear Activities or Radiation Protection Act as well as under the Swedish Environmental Code. In other words, this implies that an activity undergoes a review in two stages. A nuclear licence is only applicable for the purpose and application deriving from the licensing decision. The Swedish Government, or in certain cases SSM, examines matters concerning licences. Licensing reviews include application of the Environmental Code's general rules of consideration and provisions on environmental impact assessments. In cases where an activity is subject to Government approval, SSM processes the matter on the behalf of the Government. During its preparation of the matter, the Authority needs to consider whether the activity is likely to be sited, designed and conducted in a way fulfilling requirements imposed for safety, radiation protection and physical protection.

The processes of designing, constructing and commissioning nuclear facilities and other complex installations where ionising radiation is used take a long time to complete. This is also the case for major modifications to existing facilities of these types. Depending on the type of facility, detailed design documents are not usually available by the time applications are submitted. Also, conceivable design solutions can change over time. Problems can also arise during the construction or facility modification phase, leading to other necessary solutions. This is why a review process in steps is needed; this is also in compliance with international practice. A continued review process after a licence has been issued for construction, owning and operating a facility encompasses approval granted in steps prior to construction, test operation, routine operation and decommissioning. Each step involves reviewing the safety analysis report that is to be updated and kept up-to-date for the respective step.

Together, the Act on Nuclear Activities and Radiation Protection Act give SSM a mandate to exercise regulatory supervision in terms of radiation safety, i.e. nuclear safety, radiation protection, physical protection, security and non-proliferation control in Sweden. Both Acts also empower SSM to impose sanctions when exercising this supervision. SSM is the supervisory authority, as stipulated by the Swedish Environmental Code, as far as concerns nuclear activities and activities involving radiation that require a licence under the Code, and for this reason has the powers to issue sanctions in accordance with the Code.

C. Radioactive Waste Management, Decommissioning and Spent Fuel Strategy and Current Practices & Technologies

Twelve nuclear reactors were built in the 1970s and 1980s at four sites in southern Sweden. Ten reactors are presently in operation at three sites giving rise to radioactive waste and spent nuclear fuel. The reactors at the Forsmark, Oskarshamn and Ringhals nuclear power plants provide about 45 % of Sweden's total electrical power production. Two reactors at the Barsebäck site have since 1999 and 2005 been permanently closed down in line with previous political decisions to phase out nuclear power in Sweden. The national strategy for spent nuclear fuel is direct disposal without reprocessing, i.e. spent fuel is managed as waste and not as a resource in the Swedish programme. The spent fuel, after cooling on the reactor site, is transported by ship to the central interim storage facility, Clab, located next to the Oskarshamn power plant. A final repository for short-lived low- and intermediate-level operational waste, the SFR facility, is located next to the Forsmark power plant. The nuclear power plants at Ringhals, Forsmark and Oskarshamn, and the Studsvik site, also have shallow

land burials on site for solid short-lived low level operational waste. Other Swedish fuel cycle facilities include:

- The Westinghouse fuel factory.
- The Studsvik site, with waste treatment facilities.
- The closed down uranium extraction facility in Ranstad that is under decommissioning.
- The Ågesta nuclear power station that was in operation between 1964 and 1974. This was the first commercial NPP in Sweden. Its primary function was to provide district heating to the Stockholm suburb of Farsta.

Waste Management Strategy

A prerequisite for ensuring that all steps as part of the management chain for handling and final disposal of spent nuclear fuel and nuclear waste are coordinated and compatible with the planned solution for disposal is that licensees of facilities where spent nuclear fuel and nuclear waste occur produce plans for waste management. These plans must cover all the steps until final placement in a repository that is ultimately closed. To make sure that these plans are feasible, the waste producer must make sure that all waste acceptance criteria can be met. The waste acceptance criteria shall state the properties of the material that can be received for storage, disposal or some other management. Acceptance criteria shall, to the extent that is feasible and possible, be formulated while taking into account safety and radiation protection throughout all stages of the ongoing management.

Decommissioning Strategy

The main strategy is to start dismantling a plant as soon as it has been taken out of service. In this way a long period of shutdown operation is avoided. Generally the power companies' common goal for decommissioning of the nuclear power plants is that the site should be used for future energy production after decommissioning, since there is extensive and valuable infrastructure there including power lines, roads, harbours, cooling water channels etc. Certain buildings will also be able to be used after being released for unrestricted use.

Disposal of Operational and Decommissioning Waste

Most of the short-lived radioactive wastes are conditioned (solidified, compacted, etc.) at the point of origin, i.e. at the reactor sites. Some wastes are sent to Studsvik's waste treatment facilities for incineration or smelting.

Very low-level short-lived waste (VLLW-SL)

Very low-level short-lived waste (VLLW-SL) may be:

- disposed of in shallow land burials that are licensed under the Act on Nuclear Activities
- subject to clearance according to the regulatory authority's requirements and decisions
- be released for unrestricted use
- disposed of in municipal landfills
- incinerated using specific furnaces (only applicable to contaminated oil)

The nuclear power plants at Ringhals, Forsmark and Oskarshamn, as well as the Studsvik site, have shallow land burials for solid very low-level short-lived operational waste (<300 kBq/kg). Each burial is licensed for a total activity of 100 - 200 GBq (the highest level according to the legislation is 10 TBq, of which a maximum of 10 GBq may consist of alpha-active substances).

Low- and intermediate-level short-lived waste (LILW-SL)

Short-lived low- and intermediate-level waste (LILW-SL) is treated and packaged according to a standardized system with predefined waste type descriptions (WTD). WTDs are subject to approval by the regulatory authority. The waste is disposed of in the repository for operational waste (SFR), in rock caverns in crystalline bedrock at a depth of about 30-50 m. The repository consists of five different caverns. Wastes are directed to different parts of the repository depending on factors such as the activity content and chemical characteristics. SFR is designed for the disposal of short-lived low and intermediate level radioactive waste from the Swedish nuclear power plants, Clab, and for similar waste from other industry, research and medical usage. SFR is situated approximately 140 kilometres north of Stockholm, close to the Forsmark nuclear power plant. Approximately 40 people work at the facility. SFR consists of four rock caverns and a silo. The facility is situated in crystalline bedrock, approximately 50 m below the seabed at a water depth of 5 m. Construction started in 1983 and it was taken into operation in 1988. The total capacity is 63,000 m^3 and about 42,000 m^3 had been used by 31 December 2013. SKB is planning an extension of SFR in order to dispose of additional operational waste and waste from future decommissioning of nuclear power plants and other nuclear facilities. SKB submitted a licence application in 2014 and operation is planned to commence in 2023. The planned extension entails an increase of the facility's storage capacity by 108,000 m^3, to a total of 171,000 m^3 for the waste, and room for housing nine BWR reactor tanks.

Low- and intermediate-level long-lived waste (LILW-LL)

Long-lived low- and intermediate-level waste (LILW-LL) will be disposed of in a repository situated in rock caverns in crystalline bedrock. Until the repository has been constructed, the long-lived waste are being stored either at the NPP, at the Studsvik site or in storage pools in the interim storage facility for spent nuclear fuel (Clab). However, SKB is investigating the possibility of establishing an interim storage facility for LILW-LL in the planned extension of SFR. A decision regarding interim storage in SFR will be taken before the design of the extension has been established. Waste arising outside of the nuclear fuel cycle may–when needed and if appropriate–be disposed of in disposal facilities for nuclear fuel cycle wastes.

According to the current plans, a licence application to build a repository (SFL) for LILW-LL will be submitted in 2030 and operation is planned to commence in 2045. The origin of this waste is primarily research, industry, medical applications, core components and certain internal components from nuclear power reactors. The waste is currently stored at Studsvik, the nuclear power plants and Clab. The volume of SFL will be relatively small compared to SKB's other disposal facilities. The total storage volume is estimated at 16,000 m3. During the period 2014–2016, the main focus of the work with SFL will be the evaluation of long-term safety that is to be presented in 2016. The purpose of the safety evaluation is to choose a main alternative among proposed repository designs. Moreover, the safety evaluation will develop the set of requirements for the properties of the waste, the engineered barriers and the rock. It will not be possible to adopt acceptance criteria for conditioned waste destined for SFL until a decision has been made on the repository concept, i.e. not before the safety evaluation is concluded. The nuclear power plants should not commence final conditioning of waste until a verified repository concept exists. A study will be initiated during the period to plan the site selection process for SFL. Based on the results of the evaluation of long-term safety that is planned for 2016, preliminary requirements on the repository site can be formulated and siting factors identified. In the light of the identified siting factors, contacts can later be made with municipalities where the prospects for a siting are judged to be

favourable. Feasibility studies will then be commenced in interested municipalities. Technology development of the chosen repository concept will commence after the safety evaluation is concluded.

In the applications for the extension of SFR, SKB will also apply for a licence to interim store long-lived waste in SFR from the nuclear power plants. In the safety analysis report included in the applications, interim storage of long-lived waste will be treated as a part of the activity. The safety risk entailed by storing SFL waste in SFR will be evaluated in a safety assessment. When SFL is put into operation, the interim-stored long-lived waste will be transferred to SFL.

Disposal of Spent Nuclear Fuel (HLW)

At the nuclear power plants, the spent nuclear fuel is stored in fuel pools for at least nine months before it is transported to the central interim storage facility for spent nuclear fuel (Clab). According to the current plans, following a storage period in Clab of about 30-40 years, fuel elements will be transported to the spent nuclear fuel repository. Prior to this, they will be placed in a cast iron insert in a copper canister. In the repository, they will be surrounded by a buffer of bentonite clay and deposited in individual vertical boreholes in crystalline bedrock at a depth of 400-700 m. SKB, as well as all other waste programmes internationally, have chosen a geological repository as the preferred solution to ensure the long-term safety of disposed spent fuel or high level radioactive waste. The siting process for the repository ended in June 2009, when the board of SKB decided to choose Forsmark as the site for the repository for spent nuclear fuel. In March 2011, SKB submitted a licence application for siting and construction of the repository, which is expected to commence operation in 2029.

D. Waste classification, waste and spent fuel quantities (inventory) (including disused sources that are declared radioactive waste)

Table 1 Radioactive Waste In Storage (including spent fuel that is considered waste)

Route Waste Class	Processed (type)/ Unprocessed)	Total Current Volume (m^3)	Estimated Disposal Volume (m^3)	Distribution (%)							Planned Disposal Route (if known)
				RO	FFE	RP	NA	DF	DC / RE	ND	
Total of all Classes		9468	10468	99,8	-	-	0,2	-	-	-	
VLLW-SL	Yes	2058	2058	100	-	-	-	-	-	-	Shallow land burial
LLW-SL	Yes	2745	2745	99,7	-	-	0,3	-	-	-	geological
ILW-SL	Yes	4213	4213	99,7	-	-	0,3	-	-	-	geological
LILW-LL	No	452	1000	100	-	-	-	-	-	-	geological

NEWMDB waste origin type codes:

RO – reactor operations

FFE – fuel fabrication & enrichment

RP – fuel reprocessing

NA – nuclear applications

DF - defence

DC/RE – decommissioning & remediation

ND – Not Determined

Table 2 Radioactive Waste Disposed (as disposed volume)

Waste Class	Processed (not)	Total Volume (m^3)	Distribution (%)							
			RO	FFE	RP	NA	DF	DC / RE	ND	Disposal Route Used
Total of All Classes	Yes	54612	99,8	-	-	0,2	-	-	-	
VLLW-SL	Yes	19659	100	-	-	-	-	-	-	Shallow land burial
LLW-SL	Yes	10200	99,7	-	-	0,3	-	-	-	geological
ILW-SL	Yes	24753	99,7	-	-	0,3	-	-	-	geological
LILW-LL	-	0	-	-	-	-	-	-	-	geological

(Note: Abbreviations as in Table 1)

Table 3 Spent fuel in Storage (MTHM)

Type	Current Amount (NPP) (MTHM)	Current Amount (Research Reactors) (MTHM)
Total Spent Fuel Storage	6296	2,44
Wet storage (AR)	556	0,04
Wet storage (AFR)	5740	2,4
Dry storage (AR)	-	-
Dry storage (AFR)	-	-
Total spent fuel held in storage for other countries (amounts also included above)	-	-

Table 4 Spent fuel sent for reprocessing (in the country or sent to another country)[1] (MTHM)

Type	Current Amount (NPP) (MTHM)	Current Amount (Research Reactors)

[1] All years

Total amount Spent Fuel sent to Reprocessing (in your country)	-	-
Total amount Spent Fuel sent to Reprocessing (in another country)	-	-
Total amount of Spent Fuel received from another country for reprocessing and recycling	-	-
Total amount of Spent Fuel (MTHM) or radioactive waste (cubic metres) returned to country of origin for storage/disposal	22,5	-

AR = "at reactor site", including fuel pools at NPP

AFR = "away from reactor site"

In the case of disused sources not included in volumes according to the relevant national waste classes, please include a similar table for disused sources declared as numbers of items stored and disposed.

Table 5 below shows a translation matrix from national classification system to IAEA classes.

Table showing conversion factors from stored waste volumes to disposed waste volume for forecasts, if required.

Table 5 Example of a translation matrix (from NEWMDB) that can be used for transition from a national classification system to IAEA classification (see Section 3)

There is no legally defined waste classification scheme in Sweden for nuclear or radioactive waste. There is, however, an established waste classification scheme used by the nuclear industry in Sweden. The classification scheme used in Sweden was derived from existing and future repositories (end points).

National Waste Classification Name	**VLLW**	**LLW**	**ILW**	**HLW**
VLLW-SL	100%			
LLW-SL		100%		
ILW-SL		100%		
LILW-LL			100%	
HLW				100%

a. Tabulation of processing, storage and disposal facilities for waste and spent fuel, including their capacities and status

Tabular information of spent fuel facilities Total number of Fuel cycle facilities (by type and status) from INFCIS types "Spent Fuel Storage"; "Spent Fuel Reprocessing and Recycling" and "Spent Fuel Conditioning" Total number of waste management facilities (by type and status) from NEWMDB

Table 6 (sample of data based on format of table from INFCIS)

Type	Planned	Construction	Commissioning	In Operation	Shutdown	Decomm.	Other	Total
Spent Fuel Storage	0	0	0	5	0	0	0	5
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	0
Spent Fuel Conditioning	1	0	0	0	0	0	0	1
Spent Fuel disposal	1	0	0	0	0	0	0	1
Waste processing								
VLLW-SL				5				
LLW-SL				5				
ILW-SL				5				
LILW-LL				2				
Waste storage								
VLLW-SL				4				
LLW-SL				5				5
ILW-SL				5				5
LILW-LL	1			7				8
Waste disposal								
VLLW-SL				4				4
LLW-SL				1				1
ILW-SL				1				1
LILW-LL	1			0				1

Table 7 Summary of major sources of waste (from IAEA PRIS, INFCIS & RRDB databases)

Type	Planned	Construction	Commissioning	In Operation	Shutdown	Decomm.	Other	Total
Research reactors*	0	0	0	0	0	3	0	3
Nuclear Power reactors	0	0	0	10	2	1	0	13
Spent Fuel Reprocessing and Recycling	0	0	0	0	0	0	0	0

* Note: research reactors with medium or high power from RRDB

Note: "Planned" means it has been identified in a national report, strategy, or formal plan. It includes: Planned, Under Study-Assessment, Siting-Design phases

E. Trends and future prospects (volumes of waste and spent fuel arising, waste and spent fuel management facilities)

Forecast at	Significant points of estimations
2030	The disposal capacity for The repository for operational waste (SFR) has been increased to also give room for the decommissioning waste.
2050	The repository for long-lived low- and intermediate-level waste has been constructed, thus enabling long-lived waste to be disposed.

Table 8 e. Trends and future prospects (estimation of volumes of waste and spent fuel arising, waste and spent fuel management facilities)

Type	Current Amount	Estimated disposal amount*	Current Disposal Capacity	Total forecast at 2030	Disposal Capacity at 2030	Total forecast at 2050	Disposal Capacity at 2050
Spent Fuel Storage	6296			9500		4000	
Wet storage (AR)	556						
Wet storage (AFR)	5740						
Dry storage (AR)	0						
Dry storage (AFR)	0						
Total amount Spent Fuel sent to Reprocessing and Recycling	145			0		0	
Total amount Spent fuel disposed	0		0	0	0	8000	12600
Waste in storage:							
VLLW-SL	2058	2058		2000		2000	
LLW-SL	2745	2745		3000		3000	
ILW-SL	4213	4213		4000		4000	
LILW-LL	4000	8000		12000		10000	
Waste disposal:							
VLLW-SL	19659		38540				
LLW-SL	15007		22000	50000	108400	100000	108400
ILW-SL	19946		38500	40000	59400	50000	59400
LILW-LL	0		0	0	0	5000	16000

AR = “at reactor site”

AFR = “away from reactor site”

* calculated equivalent amount when waste has been conditioned and packaged for disposal as per table of conversion factors given.

F. Sources of data, Assumptions and References

Sweden's fifth national report under the Joint Convention on the safety of spent fuel management and on the safety of radioactive waste management, *Swedish implementation of the obligations of the Joint Convention.* Available electronically:
http://www.government.se/download/151f36ae.pdf?major=1&minor=246668&cn=attachmentPublDuplicator_0_attachment

RD&D Programme 2013. Programme for research, development and demonstration of methods for the management and disposal of nuclear waste, SKB TR-13-18.
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http://www.skb.se/upload/publications/pdf/TR-13-18.pdf

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