

# Country Waste Profile Report for France

## Reporting year: 2000

For guidance on reading Country Waste Profile Reports, please refer to the following internet based document:

<http://www-newmdb.iaea.org/help/profiles5/guide.pdf>

For further information, please contact the Responsible Officer via e-mail:

NEWMDB@IAEA.org

The scope and limitations of the first and second NEWMDB data collection cycles (July 2001 - March 2002 and July 2002 - February 2003) are described in the report "Second Consolidated Radioactive Waste Inventory" (April 2003):

<http://www-newmdb.iaea.org/help/profiles5/inv.pdf>

## Waste Class Matrix(ces) Used/Defined

Country: France

Reporting Year: 2000

**Waste Class Matrix: IAEA Def. , Not Used**

Description: The Agency's standard matrix

**Waste Class Matrix: M1**

Waste Class Name	LILW_SL%	LILW_LL%	HLW%
TFA	100	0	0
FMA-VC	100	0	0
FA-VL	0	100	0
MA-VL	0	100	0
HA	0	0	100

Description: M1 valid for all producers. Classification based on disposal options & nature of waste (act. level & half-life of main radionuclides) and not specified by law/regulation. The French classes are: TFA (VLLW), FMA-VC (LILW, short-lived), FA-VL (LLW, long-lived), MA-VL (ILW, long-lived), HA (HLW). Percentages have been indicated for TFA and FA-VL as required by the NEWMDB system. However they are artificial since, according to our opinion, they do not correspond to any IAEA classes (see comments).

**Comment #139: TFA and FA-VC waste**

TFA waste mainly originates from nuclear plants dismantling. Its activity level is close to the one defined by the international organizations for exempt waste. The disposal option is a surface repository the design of which is more simple than the design of the Centre de l'Aube facility. It can be assimilated to neither of the IAEA classes. FA-VC waste comprises graphite waste and radium waste which mainly originates from non-nuclear industries. The disposal option is a sub-surface repository. This type of waste can be assimilated to neither of the IAEA classes.

## Groups Overview

Country: France

Reporting Year: 2000

**Reporting Group:** National

Inventory Reporting Date: December 2000

Waste Matrix Used: M1

Description: A single "theoretical" site is considered for the present submission: the quantities of waste correspond to the sum of the quantities existing on the various sites.

Site Name	Facilities Defined			
	Processing	Storage	Disposal	Dedicated SRS
All sites	4	1	2	1

**Comment #284: Storage**

Storage areas or storage buildings often exist on the sites where waste is generated, and, if it is the case, treated and conditioned. The storage facilities are either modular or non-modular. In general, storage facilities have adequate remaining capacity. A value of 0 was entered because an average percent filled value was not available within the deadline for NEWMDB reporting.

**Comment #287: Centre de l'Aube capacity**

The Centre de l'Aube is authorized for 1000000 m<sup>3</sup> and the piece of land which belongs to Andra (the operator of the disposal facility) is sufficient for that. The waste which has already been disposed of represents 11% of the authorized capacity, being understood that it represents 66% of the engineered units built up to now. The engineered units are built as and when required: that explains that the waste occupies 66% of the build units but 11% of the authorized capacity.

**Comment #307: Comment about TFA and FA-VL waste**

As it is explained in the comment related to the waste matrix, France considers that TFA waste is not a LIL-SL waste and FA-VL is something between 2 classes of the IAEA classification (LIL-SL waste and LIL-LL waste). Therefore the Country Coordinator has decided not to report them in the present IAEA report. However, the quantities of those specific categories of waste are given here: the existing TFA waste in stock is estimated at 60000 m<sup>3</sup> (unprocessed waste); the existing FA-VL waste in stock is estimated at 60000 m<sup>3</sup> (50000 m<sup>3</sup> unprocessed waste plus 10000 m<sup>3</sup> processed waste).

## Site Structure: All sites

Country: France

Reporting Year: 2000

Full Name: All French sites

License Electricity of France (EdF), CEA, COGEMA, ANDRA, FBFC, CEZUS,  
 Holder(s) : COMURHEX, EURODIF, SICN, SOMANU, STMI, SOCODEI, SOCATRI,  
 CERCA,CIS-BIO, Direction Générale des Armées,...

**Processing Facilities**

Name	NPP
Description	Nuclear power plants (production of electricity).
Type	treatment, conditioning

Name	R.C.
Description	Research centers (for electro-nuclear activities, defense,...) located at FONTENAY AUX ROSES, SACLAY, CADARACHE, GRENOBLE, BRUYERE LE CHATEL, VALDUC.
Type	treatment, conditioning

Name	R.P.
Description	LA HAGUE and MARCOULE reprocessing plants (reprocessing of spent fuels).
Type	treatment, conditioning

Name	OTHERS
Description	Several sites (enrichment, fuel manufacture, maintenance, Defense, non electro-nuclear activities...)
Type	treatment, conditioning

**Storage Facilities**

Name	All sites
Description	Generally, processing/conditioning sites have storage facilities.

## Types of Storage Units

Unit Name	Type	Operating Life (years)	Status	% filled	Modular
All	building	50	open	0	YES

**Disposal Facilities**

Name	C. M.
Description	Centre de la Manche facility: surface disposal facility for LIL-SL waste.
Type	engineered surface

Facility is modular

Capacity - existing (m3)	527000	Capacity -planned (m3)	527000
% of <b>existing capacity</b> used	100	Depth (m)	0
Host medium	crystalline rock (other)		

Waste Class	Actual	Planned	Waste Class	Actual	Planned
TFA	No	No	FMA-VC	Yes	No
FA-VL	No	No	MA-VL	No	No
HA	No	No			
Disused/spent, sealed radioactive sources (SRS).				Yes	No

Phase	Start Year	End Year
planning and/or concept assessment	1967	1967

## Site Structure: All sites

Country: France

Reporting Year: 2000

site selection	1967	1967
design	1967	1994
construction	1969	1994
commissioning	1969	1994
operation	1969	1994
closure	1991	1997
institutional control	2002	

Name	C.A.		
Description	Centre de l'Aube facility: surface disposal facility for LIL-SL waste.		
Type	engineered surface		
Facility is modular			
Capacity - existing (m3)	170000	Capacity -planned (m3)	1000000
% of <b>existing capacity</b> used	66	Depth (m)	0
Host medium	sedimentary rock (consolidated clay)		

Waste Class	Actual	Planned	Waste Class	Actual	Planned
TFA	No	No	FMA-VC	Yes	Yes
FA-VL	No	No	MA-VL	No	No
HA	No	No			
Disused/spent, sealed radioactive sources (SRS).				No	No

Phase	Start Year	End Year
planning and/or concept assessment	1984	1985
site selection	1984	1985
design	1985	2060
construction	1989	2060
commissioning	1992	2060
operation	1992	2060
closure	2060	2065
institutional control	2070	

**Dedicated SRS**

Name	All SRS
Description	various sites ( SACLAY, CADARACHE, PIERRELATTE, Nuclear Power Plant)
Type	storage

**Comment #281: All Sites**

- 1- storage areas or storage buildings often exist on the sites where waste is generated, and, if it is the case, treated and conditioned. The storage facilities are either modular or non-modular. The occupied capacity varies from one facility to another.
- 2- The authorized capacity of the Centre de l'Aube facility is 1000000 m<sup>3</sup>, but the engineered units are build as and when required.

## Site Data: All sites

Country: France

Reporting Year: 2000

Full Name: All French sites

Inventory Reporting Date: December 2000

Waste Matrix: M1

## Waste Inventory

Class	Location	Proc.	Volume (m3)	Distribution in %					
				RO	FF/FE	RP	NA	DF	DC/RE
FMA-VC	Storage	No	5000	20	5	40	0	25	10
The additional characteristics of the waste: liquid (aqueous); liquid (organic); resin; sludge; solid (dispersible); solid (non-dispersible)									
FMA-VC	Disposal	Yes	640000	45	7	35	3	5	5
The additional characteristics of the waste: resin; sludge; solid (non-dispersible)									
MA-VL	Storage	No	20000	20	0	75	0	5	0
The additional characteristics of the waste: sludge; solid (dispersible); solid (non-dispersible)									
MA-VL	Storage	Yes	26000	20	0	75	0	5	0
The additional characteristics of the waste: solid (non-dispersible)									
HA	Storage	No	500	0	0	100	0	0	0
The additional characteristics of the waste: liquid (aqueous)									
HA	Storage	Yes	1450	0	0	100	0	0	0
The additional characteristics of the waste: solid (non-dispersible)									

Proc.=Is the waste processed (Yes/No)?

RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications, DF=Defence, DC/RE=Decommissioning/Remediation

## Processing - Treatment method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Calcination	No	No	same	No
Chemical Precipitation	No	No	decrease	No
Compaction	No	No	same	No
Deactivation (of Sodium)	No	Yes		No
Decontamination	No	No	same	No
Encapsulation	No	No	same	No
Evaporation	No	No	same	No
Incineration	No	No	increase	No
Ion Exchange	No	No	same	No
Mercury Treatment	No	Yes		No
Metal Melting	No	No	increase	No
Organic Destruction	No	No	same	No
Radionuclide Separation	No	Yes		No
Shredding and Compaction	No	No	increase	No
Size Reduction	No	No	same	No
Stabilization	No	No	same	No
Super Compaction	No	No	same	No

## Processing - Conditioning method(s)

Method	Status			
	Planned	R&D program	Current practice method use over the last 5 years	Past Practice
Cementation	No	No	same	No
Bituminization	No	No	decrease	No
Polymerization	No	No	same	No
Vitrification	No	No	same	No

## REGULATORS

Country: France

Reporting Year: 2000

Name	DGSNR
Full Name	Direction Générale de la Sûreté Nucléaire et de la Radioprotection
Division	
City or Town	Paris
Wastes that are regulated by the Regulator	Matrix M1 - FMA-VC, FA-VL, MA-VL, HA
Name	DPPR
Full Name	Direction de la Prévention des Pollutions et des Risques (Ministère de l'Environnement)
Division	
City or Town	Paris
Wastes that are regulated by the Regulator	Matrix M1 - TFA

## REGULATIONS

Country: France

Reporting Year: 2000

Name	Law	
Title or Name	Law 91-1381 on Radioactive Waste Management Research (research on high level long lived radioactive waste and creation of the French Radioactive Waste Management Agency)	
Reference Number	91-1381	
Date Promulgated or Proclaimed	1991-12-30	Law
Wastes that are covered by the identified Law	Matrix M1 - TFA, FMA-VC, FA-VL, MA-VL, HA	

**Comment #162: Law 91-1381**

The law 91-1381 has two aspects:

- 1- it defines the research in the field of high level long lived radioactive waste management(MA-VL and HA waste),
- 2- it creates Andra, the French Agency in charge of the radioactive waste management.As such, the law involves all the classes of the radioactive wastes.

Name	RFS 1-2	
Title or Name	Basic Safety Rule I-2 concerning the safety objectives and the design bases of surface repositories for low intermediate level short lived waste.	
Reference Number	RFS I-2	
Date Promulgated or Proclaimed	1984-06-19	Regulation
Wastes that are covered by the identified Law	Matrix M1 - FMA-VC	

Name	RFS 3-2-e	
Title or Name	Basic Safety Rule III-2-e concerning the acceptance conditions of low intermediate short lived waste in a surface repository.	
Reference Number	RFS III-2-e	
Date Promulgated or Proclaimed	1995-05-29	Regulation
Wastes that are covered by the identified Law	Matrix M1 - FMA-VC	

**Comment #163: RFS III-2-e**

The first version of the RFS III-2-e was issued on 31 october 1986.



## REGULATIONS

Country: France

Reporting Year: 2000

Name	RFS 3-2-f	
Title or Name	Basic Safety Rule III-2-f concerning the objectives to be adopted in the design and construction of a deep geological formation radioactive waste repository to ensure safety after closure of the repository.	
Reference Number	RFS III-2-f	
Date Promulgated or Proclaimed	1991-06-10	Regulation
Wastes that are covered by the identified Law	Matrix M1 - MA-VL, HA	

## MILESTONES

Country: France

Reporting Year: 2000

Start Year or Reference Year:	1969	End Year	1994
Description of Milestone			
Operation of the Centre de la Manche facility (surface disposal of LIL-SL). A new repository started in 1992 (Centre de l'aube facility).			

Start Year or Reference Year:	1994	End Year	1999
Description of Milestone			
<p>Following the mediation mission led by a national assemblyman, Andra conducted surveys on 3 sites for underground research laboratories (URL). In 1996 Andra filed 3 applications for installation and operating permits for the URL's. In 1999, the French government authorized Andra to construct a URL in a clay formation at the border of Meuse and Haute-Marne departments (east of France). The works are in progress.</p> <p>Parallel to the works regarding the east of France URL, Andra uses the available knowledge of the French granitic formations and participates to experiments in URL's (in granite) abroad in order to build up a file which will be sent to the government at the same time as the file concerning the feasibility of a deep geological disposal in the clay formation at the east of France URL.</p> <p>CEA studies the 2 other research directions set by the law of 30 december 1991 ( separation/transmutation, long term storage and conditioning) and the works are well in progress.</p>			

Start Year or Reference Year:	2000	End Year	2000
Description of Milestone			
Geological surveys for a very low level waste repository and choice of the site.			