

# FRANCE

Date of first nuclear explosion- 13 February 1960

## 1. AMOUNT, LOCATION, AND OPERATIONAL PLAN OF NUCLEAR WEAPONS

Weapon System	No. deployed	Range (km)	Yield (Kt)	No. in stockpile
Mirage 2000N/ASMP	45	2,750	300	50
MSBS M4A/B	16	6,000	150	96
MSBS M45	32	6000	100	192
Super Étendard/ ASMP	24	650	300	10
<b>Total</b>				<b>348</b>

France's nuclear force consists mainly of its four nuclear-powered ballistic missile submarines, each with a load of 16 missiles with 6 warheads each. France also maintains approximately 60 air-to-surface supersonic missiles (ASMP) carried by fighter/bomber aircraft.

Kristensen, Hans and S. Kile, "World Nuclear Forces," *SIPRI Yearbook 2003: Armaments, Disarmament and International Security*, Oxford University Press: Oxford, 2003.

### The Role of Nuclear Weapons in National Security Strategy

Nuclear deterrence remains a central component of French national defense, as outlined in the 1994 White Paper on Defense, Appended report 2003-2008 Military programme, "Arms control, disarmament, and non-proliferation: French policy." [http://www.defense.gouv.fr/actualites/dossier/d54/sommaire\\_ang.html](http://www.defense.gouv.fr/actualites/dossier/d54/sommaire_ang.html)

President Jacques Chirac outlined the role of nuclear weapons in French national security in a speech before L'Institut des Hautes Études de la Défense Nationale, École Militaire, Paris, 8 June 2001. Some excerpts include:

"Nuclear deterrence is first of all a major factor of international stability. It is due to this deterrence that Europe has been preserved for more than fifty years from the ravages it had known in the course of the 20th century. Demanding restraint, calling for reason, the credible nuclear threat commands the peace... Our nuclear forces are not directed against any country, and we have always refused that the nuclear weapon be considered as a battle weapon used in a military strategy... At the very time when considerable arsenals still exist and others are being developed in various parts of the world, this guarantee remains fundamental...What I am affirming before you is that France, while remaining faithful to its concept of non-use, has and will conserve the means of maintaining the credibility of its deterrence in face of all new threats..."

### Nuclear Weapon Deployment/Storage Sites

Luxeuil- Mirage 2000 aircraft base

Istres- Mirage 2000 aircraft base

Landivisiau- Super Étendard aircraft

L'Île Longue: SSBN bases

## 2. ACTIVITIES SPECIFICALLY UNDERTAKEN IN ACCORDANCE WITH ARTICLE VI OF NPT

France undertook major reductions and terminations in 1991-1992 and in 1996-1997.

The 1991 and 1992 measures include:

- abandonment of the strategic surface-to-surface S45 missile program, which had been intended to replace the S3D missiles on the Plateau d'Albion;
- early withdrawal of the Pluton short-range surface-to-surface missiles;
- dismantling of the AN52 nuclear bombs carried by Jaguar and Mirage III aircraft;
- reduction in the number of SSBNs in service from 6 to 5 and a longer production timetable for new generation SSBNs;
- a cut in the Hadès short-range surface-to-surface missile program from 120 to 130 units,
- plus the decision to store rather than deploy this weapons system.

**The 1996 measures include:**

- limiting SSBNs maintained in the operational cycle to 4;
- withdrawing the Mirage IV strategic aircraft from nuclear missions;
- withdrawing from service the surface-to-surface component on the Plateau d'Albion, the closure of this site and the final withdrawal of the Hadès weapon system, followed by the dismantling of its missiles;

France is now the only Nuclear Weapon State to have totally eliminated its formerly deployed surface-to-surface nuclear weapon systems.

Since the end of the Cold War, the total number of delivery vehicles has been cut by over half.

**Reducing the nuclear budget:**

- the share of the defense budget allocated to nuclear expenditure has been reduced by 58% since 1990
- the defense budget share in 2005 is 20.7% of the defense equipment budget

<http://www.mvtpaix.org>

**The cessation of all nuclear testing and the dismantling of the installations of the Pacific test site:**

- following the unilateral moratorium on nuclear tests decided in April 1992 and after a final series of tests, France, on 29 January 1996, announced the cessation of all nuclear testing ;
- the complete dismantling of the testing facilities in the Pacific has been announced as early of 22 February 1996 and completed by the end of July 1998;

France is the only Nuclear Weapon State to have closed down and dismantled its nuclear testing facilities.

### **3. LOCATION AND CAPABILITY OF NUCLEAR FACILITIES**

**Power Reactors**

Operational: 59  
Shut down: 11  
Decommissioned: 0  
Planned: 0

<http://www.iaea.or.at/programmes/a2/>

**Research Reactors**

Operational: 15  
Shut down: 11  
Decommissioned: 5  
Planned: 1

<http://www.iaea.or.at/worldatom/rddb/>

**Other nuclear facilities**

CEA laser-based uranium enrichment research (SILVA)  
COGEMA MOX fuel fabrication plant, Cadarache (Bouches-du-Rhône)  
MELOX MOX fuel fabrication plant, Marcoule (Gard)  
COGEMA/SICN nuclear fuel fabrication plant, Veurey-Voroize (Isère)  
FBFC nuclear fuel fabrication plant, Romans-sur-Isère (Drôme)  
COGEMA EURODIF enrichment plant, Tricastin (Drôme)  
Comurhex uranium conversion plant, Malvési (Aude)

Comurhex uranium conversion plant, Pierrelatte (Drôme)  
Cogéma Pierrelatte TU5 conversion facility (Drôme)  
UP-800 and UP3, reprocessing facilities (La Hague)  
Nuclear weapon research and/or production site (Balduc)  
Nuclear weapon research or production site (Limeil)  
Megajoule Laser LMJ, (Le Barp)  
Sub-critical testing facility (Moronvilliers)  
<http://www.antenna.nl/wise/uranium/epfr.html>

At Marcoule, the production of plutonium has been halted but tritium production continues. The cleanup of the site requires the elimination of the stock of waste produced by the nuclear fuel reprocessing plant. <http://www.globalsecurity.org/wmd/world/france/marcoule.htm>

#### 4. FISSILE MATERIAL HOLDINGS

France suspended weapons-grade plutonium production in 1992 (Marcoule) and HEU production in 1996 (Pierrelatte uranium enrichment plant), the first State to do so.

##### Military Stocks of Fissile Material

- Plutonium: 5 tons
- HEU: 29 tons

[http://www.isis-online.org/global\\_stocks/military\\_excess\\_heu.html](http://www.isis-online.org/global_stocks/military_excess_heu.html)

Declared Excess- 0

Unirradiated Civil Plutonium- 79.9 tons: (47.9 tons nationally-owned, 32 tons foreign owned)

Irradiated Civil Plutonium- 182 tons

Separated Civil Plutonium- 40-50 tons (estimated 2010)

[http://www.isis-online.org/global\\_stocks/plutonium\\_watch2004.html](http://www.isis-online.org/global_stocks/plutonium_watch2004.html)

By significantly increasing the fraction of fresh plutonium put into MOX fuel, France will have a large separated plutonium stock well into the future.

[http://www.isis-online.org/global\\_stocks/separated\\_civil\\_pu.html](http://www.isis-online.org/global_stocks/separated_civil_pu.html)

##### Waste Management

*Low-level waste:* Since 1992, the Centre de l'Aube Disposal Facility is currently France's site for LLW disposal.

*High-level waste:* Spent nuclear fuel is kept for one year on site in specially constructed storage pools. Following storage, spent nuclear fuel is transported to the La Hague and Marcoule reprocessing plants and stored in pools for two to three years. The French Waste Management Research Act of December 1991 authorized 15-year studies of three management options for HLW, including separation and/or transmutation, long-term storage, and geologic disposal. One site under consideration for deep geologic disposal in clay is currently being studied. The French are also searching for a granite site to research. <http://www.ocrwm.doe.gov/factsheets/doeymp0411.shtm>

#### 5. NUCLEAR ACTIVITIES

##### Nuclear Research Centers

BRGM - Bureau de recherches géologiques et minières

CEA

CECAM - Centre Européen de Calcul Atomique et Moléculaire

CENBG - Centre d'études nucléaires de Bordeaux Gradignan

CEPN - Centre d'étude sur l'Evaluation de la Protection dans le domaine Nucleaire

CESEN - Cercle d'étude sur l'énergie nucléaire  
CNE - Commission nationale d'évaluation  
CNRS - Centre National de la Recherche Scientifique  
CRPG - Centre de Recherches Petrographiques et Geochimiques  
EDF Research Division  
ESRF - European Synchrotron Radiation Facility  
EVARISTE - Etude et Valorisation des Activités de Recherche et d'Innovation Scientifique et Technique pour les Entreprises  
GANIL - Grand Accélérateur National d'Ions Lourds  
GdR FORPRO - Groupement de Recherches FORMations géologiques PROfondes  
Grenoble Hybrid Reactors Group  
ILL - Institute Laue-Langevin  
INERIS - Institut National de l'Environnement Industriel et des Risques  
L'Institut de Physique Nucléaire d'Orsay  
LLB - Laboratoire Léon Brillouin  
LURE - Laboratoire Français de rayonnement synchrotron  
<http://www.radwaste.org/research.htm>

### **Nuclear Cooperation**

*Vietnam*: Agreement (26 May 2004) to cooperate on the construction of a nuclear power plant by 2020

*US*: Agreement (24 August 2004) to provide DOE access to the PHENIX fast spectrum test reactor.

*Bulgaria*: Agreement on nuclear power and safety

*Pakistan*: Cooperation in nuclear technology for agriculture, medicine, the environment, industry, and radiation protection

*Ukraine*: Cooperation in nuclear fuel cycle and waste treatment techniques

[http://www.world-nuclear.org/info/printable\\_information\\_papers/inf38print.htm](http://www.world-nuclear.org/info/printable_information_papers/inf38print.htm)

## **6. INTERNATIONAL NON-PROLIFERATION EFFORTS**

France is also a participant in the G8 Global Partnership against the spread of weapons and materials of mass destruction, launched in Kananaskis, Canada 2002.

### **Treaties Signed and Ratified**

Antarctic Treaty, 16 September 1960

APM Convention, 23 July 1998

Biological and Toxin Weapons Convention, 27 September 1984

Certain Conventional Weapons Convention, 4 March 1988

Comprehensive Nuclear Test-Ban Treaty, 6 April 1998

Chemical Weapons Convention, 2 March 1995

Nuclear Non-Proliferation Treaty, 3 August 1992

Outer Space Treaty, 5 August 1970

France ratified the IAEA Additional Protocol on 10 April 2004.

### **Multilateral Groups**

Conference on Disarmament

Hague Code of Conduct against Ballistic Missile Proliferation

Missile Technology Control Regime

Nuclear Suppliers Group

Proliferation Security Initiative

Wassenaar Arrangement

Zangger Committee

## **7. POSITIONS TAKEN IN INTERNATIONAL FORA ON VARIOUS ISSUES OF NUCLEAR DISARMAMENT**

*Additional Protocol*: "...France calls on all of the States parties to the NPT that have not yet done so, and in particular those with nuclear activities, to sign and implement as soon as possible a comprehensive safeguards agreement and an additional protocol. France...proposes that the additional protocol be made a condition for supply of the most sensitive nuclear goods." - **Statement by H.E. François Rivasseau to the Preparatory Committee of the 2005 Review Conference of the NPT, 26 April 2004.** <http://www.reachingcriticalwill.org/legal/npt/prepcom04/france27.pdf>

*Nuclear energy*: "France...is convinced of the importance of nuclear power within a diversified energy policy and as an essential contribution to sustainable development... It also attaches great importance to ensuring that countries wishing to pursue their development are able to enjoy the benefits of nuclear technologies..." - **Statement by H.E. François Rivasseau to the Preparatory Committee of the 2005 Review Conference of the NPT, 26 April 2004.** <http://www.reachingcriticalwill.org/legal/npt/prepcom04/france27.pdf>

*Disarmament*: "The logic of strict sufficiency has consistently dictated the format of its deterrent force, a key pillar of France's security. That is not to say that it has interrupted its disarmament effort. For instance, dismantling of the Pierrelatte and Marcoule facilities for producing fissile materials for nuclear weapons continues to this day... Finally, pursuing to Article VI of the NPT, France is working for general and complete disarmament. I will confine myself to reminding you that France is active in all areas of disarmament." - **Statement by H.E. François Rivasseau to the Preparatory Committee of the 2005 Review Conference of the NPT, 29 April 2004.** <http://www.reachingcriticalwill.org/legal/npt/prepcom04/franceCLI.pdf>