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Nuclear weapons at a glance: France

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Summary

France first tested a nuclear weapon in 1960, eight years after the UK and four years before China. The last French tests took place in 1996, just prior to the conclusion of the Comprehensive Nuclear Test Ban Treaty (CTBT), which it signed and ratified in 1998.

Since the end of the Cold War France has scaled back its nuclear arsenal by 50 per cent, with a reduction in both its overall holdings but also the withdrawal of several weapons systems, including its land-based ballistic missile capability. France is the only nuclear weapon state to have dismantled, in its entirety, a ground-launched nuclear capability.

In 1992, and again in 1996, France reduced its alert levels, in terms of both response times and the number of weapons systems on alert. All of France's nuclear forces have been de-targeted. France retains a first-use policy.

France's nuclear stockpile is currently "fewer than 300" warheads, capable of being launched by combat aircraft and submarine, operating on a continuous at-sea basis. Both components have been modernised over the last decade.

France does not participate in NATO's nuclear planning mechanisms and its forces are not formally assigned to NATO.

This short paper is intended as an introduction to France's nuclear weapons policies and programmes. It is part of a series of country profiles which are available on the [House of Commons Library website](#).

A more in-depth examination is also available in [The French Nuclear Deterrent](#), House of Commons Library, October 2020

1. Nuclear status

Under the Nuclear Non-Proliferation Treaty (NPT) a nuclear weapon state is defined as one that manufactured and exploded a nuclear weapon, or other nuclear explosive device, prior to 1 January 1967.

France first tested a nuclear weapon in 1960, eight years after the UK and four years before China.

Alongside the other permanent members of the UN Security Council (the P5), France is, therefore, one of the five officially recognised nuclear weapon states under the NPT.

2. Nuclear Policy

France maintains a policy of “strict sufficiency” whereby France maintains its nuclear arsenal at the lowest possible level compatible with the strategic context.¹

At the same time France is committed, in the longer term, to a nuclear disarmament action plan, including upholding the NPT, universal ratification of the Comprehensive Test Ban Treaty (CTBT), immediate negotiation of a Fissile Material Cut-off Treaty (FMCT) and the continuation of work on nuclear disarmament verification.

However, France’s traditional view is that disarmament cannot be an objective in itself and must be tied to improvements in international security. In a [speech on defence and nuclear deterrence](#) in February 2020, President Macron ruled out French unilateral disarmament on that basis:

I cannot [...] set France the moral objective of disarming our democracies while other powers, or even dictatorships, would be maintaining or developing their nuclear weapons.

For a nuclear-weapon State like France, unilateral nuclear disarmament would be akin to exposing ourselves as well as our partners to violence and blackmail, or depending on others to keep us safe.

I refuse this prospect. And let us not be naïve: even if France, whose arsenal cannot be in any ways compared to that of the United States and Russia, were to give up its weapons, the other nuclear powers would not follow suit.²

Indeed, in that same speech he went on to suggest that the French nuclear deterrent should play a central role in Europe’s collective security, presumably within the context of the EU’s Common Security and Defence Policy (CSDP). To this end he called for strategic dialogue with willing European partners and outlined the potential for their involvement in military exercises conducted by French deterrent forces. He stopped short, however, of proposing the sharing of any nuclear assets.

He did express support, however, for broader discussions aimed at multilateralisation of the nuclear disarmament agenda:

This crucial debate should not take place without Europeans, in a direct and exclusive relationship between the United States, Russia and China. And I know very well that this is the temptation for some, sometimes those that are the most concerned [...]

Following the collapse of the INF Treaty, France wishes to see broader discussions start, in which Europe must have its voice be heard and ensure that its interests will be taken into consideration in negotiations for a new instrument that could ensure strategic stability on our continent. Let’s be clear, if a negotiation and a wider treaty are possible, we would support them. If they are blocked by some, we won’t stay idle. And the Europeans must be

¹ This policy was reiterated by President Macron in a [speech on defence and deterrence](#) in February 2020.

² Speech of the President on the [Defense and Deterrence Strategy](#), 7 February 2020

a part of, and signatories to, the next treaty, for what is at stake is our territory and a discussion that cannot take place above ourselves.³

2.1 Declaratory Policy

The purpose of French nuclear doctrine is to “limit the role of deterrence to extreme circumstances of self-defence”.⁴

However, France reserves the right to use nuclear weapons first in a conflict. Specifically, France reserves the right to conduct “a unique and one-time-only” limited nuclear strike to demonstrate to an aggressor that “the nature of the conflict has changed and to re-establish deterrence”.⁵

France has also pledged not to use nuclear weapons against non-nuclear weapon states party to the NPT and abiding by their non-proliferation commitments.

³ The collapse of the INF treaty is discussed in greater detail in Library Briefing Paper, CBP8634, [Demise of the Intermediate-Range Nuclear Forces \(INF\) Treaty](#)

⁴ Speech of the President on the [Defense and Deterrence Strategy](#), 7 February 2020

⁵ *ibid*

3. Nuclear arms control agreements

As one of the recognised nuclear weapon states under the NPT, France has a legal obligation to pursue disarmament under Article VI of that treaty.

France signed the Comprehensive Test Ban Treaty in 1996 and ratified it in 1998.

France also advocates the immediate conclusion of a fissile material cut-off treaty.

France has not signed the [Treaty on the Prohibition of Nuclear Weapons](#) which is due to enter force in January 2021.

4. Nuclear capabilities

Over the last decade, France has been modernising its nuclear arsenal, through the deployment of a new class of SSBN and the continuous upgrade of its nuclear-armed missile capabilities.

Indeed, in 2010 the extent of French nuclear modernisation plans prompted US Senator Saxby Chambliss, a member of the Senate Armed Services Committee, to argue that both France and the UK surpassed the United States in terms of nuclear modernisation and that consequently the US had “a lot of catching up to do”.⁶

Stockpile

France’s official position is that it currently has “fewer than 300 nuclear warheads”, all of which are deployed and operational.⁷ It is widely estimated among experts that there are 290 warheads in the French nuclear stockpile.

Fissile material

In February 1996 France announced that it had halted the production of fissile material for weapons purposes and that it would dismantle the production facilities dedicated to its weapons programme. Like the other nuclear weapon states, France retains a stockpile of fissile material, estimated to be approximately 30 tons of HEU and 6 tons of plutonium.⁸

French Navy

The bulk of the French deterrent is maritime based, with the Navy having responsibility for around 80 per cent of the arsenal.

The majority of that capability is delivered through its fleet of four *Triomphant* class ballistic missile submarines which are capable of carrying up to 16 M-51 SLBM apiece.⁹ The Navy retains a total of 48 SLBM in its inventory. The new M-51 came into service in 2010 and provides greater range,¹⁰ accuracy and operational flexibility than its predecessor, the M-45.¹¹ The process of replacing all the Navy’s M-45 SLBM with the M51 was completed in August 2018.

The majority of the M-51 SLBM has the same payload as the M-45, in the form of the TN75 warhead. However, France has also been developing a new, more robust,¹² nuclear warhead, the Tête Nucléaire

⁶ “Senator says France, UK surpass US in nuke modernization”, *Global Security Newswire*, 16 April 2010

⁷ Report submitted by France to the NPT Review Conference, 2015 ([NPT/CONF.2015/10](#))

⁸ International Panel on Fissile Materials, [Global Fissile Material Report 2019](#)

⁹ The first of class entered service in 1997, the second in 1999, the third in 2005, and the final vessel of class entered service in mid-2010.

¹⁰ The M51 has an approximate range of around 6,000 km when carrying a full payload of up to 6 warheads of variable yields and penetration aids, although that range would reportedly increase to 8,000km if only a single warhead is carried.

¹¹ The M-51 is reported to be capable of deploying up to six warheads of variable yields; while it will also be possible to detonate the warheads at high altitude, generating an electro-magnetic pulse.

¹² Robust warheads are less sensitive, for example, to the ageing of components.

Oceanique (TNO). That warhead is carried on upgraded M-51.2 missiles, which is incrementally replacing the M-51. The M-51.2 has a greater range than the original M-51 SLBM, with some analysts suggesting that it could have a maximum range of 9,000km, dependant on payload.¹³

France's SSBN have maintained a continuous at-sea deterrent posture since 1972. One SSBN is in maintenance at any given time.

The French Navy also operates a single squadron of 10 Rafale MF3 aircraft,¹⁴ equipped with nuclear-armed, medium range, ASMP-A cruise missiles. Those aircraft are capable of being deployed aboard its aircraft carrier the *Charles de Gaulle*. The ASMP-A entered serviced in 2009 and has improved manoeuvrability, enhanced accuracy and an increased range of 600km. It is also equipped with the new Tête Nucléaire Aero-Portée (TNA) warhead.¹⁵

Air Force

The French Air Force has two squadrons assigned to the nuclear role, comprising approximately 40 Rafale F3 aircraft (20 apiece).¹⁶ The Rafale F3 is equipped with the ASMP-A cruise missile and TNA warhead.

¹³ Bruno Tertrais, [French Nuclear Deterrence, Policy, Forces and Future: A Handbook](#), February 2020

¹⁴ The Rafale MF3 replaced the Super-Etendard in 2015

¹⁵ The air-launched equivalent of the TNO.

¹⁶ The Rafale F3 began taking over the nuclear strike mission from the Mirage 2000N in 2009. The last of the nuclear capable Mirage 2000N retired in 2018.

5. Modernisation of France's nuclear arsenal

In his [February 2020 speech](#) President Macron reiterated that, with respect to its nuclear capabilities, France “will continue to take the decisions necessary to maintain their long-term operational credibility at the level of strict sufficiency required by the international environment”.

In 2018 funding for France's ongoing nuclear modernisation programme up to 2025 was approved. €37 billion was assigned to maintain and modernise France's nuclear forces and infrastructure, which was a significant increase from the €23 billion assigned for 2014-2019.

In 2020 the French nuclear deterrent is expected to account for 12.5 per cent of the defence budget,¹⁷ approximately €6 billion (£5.3 billion).

Naval capabilities

Work on upgrading the M-51 SLBM to the M-51.2 standard, deployed with the new TNO warhead, continues across the fleet.

France adopts an evolutionary approach to upgrading its missile technologies, which is also thought to exploit synergies with France's space sector.¹⁸ Design work has therefore commenced on a new M-51.3 SLBM. According to the French Ministry of Defence it is scheduled to be operational and begin replacing the M-51.2 in 2025. Proposals for an M-51.4 SLBM are also on the table.

Preliminary design work has also begun on a next generation SSBN to replace the *Triomphant* class, which is due to leave service in the 2030s. Designated the SNLE 3G, construction of the first of class is scheduled to start in 2023.

Air Force capabilities

A mid-life refurbishment for the ASMP-A missile began in 2016 which will deliver the first upgraded missiles in 2022-2023 and keep them in service until 2035.

Research on a next generation missile has also begun. Designated the ASN4G (air-to-surface nuclear fourth generation), the missile will have enhanced stealth and manoeuvrability to counter potential improvements in air defence technologies. The ASN4G is expected to replace the ASMP-A in 2035.

¹⁷ Bruno Tertrais, French Nuclear Deterrence Policy, Forces and Future: A Handbook, February 2020

¹⁸ It has been suggested that research and development work on the M-51 is closely connected with development of the Ariane satellite launch vehicle (see “Ballistic trajectory: French SLBM technology developments boost operational output”, *Jane's Defence Weekly*, 25 September 2018)

Box 1: Suggested reading

- [*The French nuclear deterrent*](#), House of Commons Library, November 2020
- Bruno Tertrais, [French Nuclear Deterrence Policy, Forces and Future: A Handbook](#), February 2020

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