IV. French nuclear forces

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France’s nuclear arsenal consists of approximately 300 warheads for delivery by submarine-launched ballistic missiles (SLBMs) and air-launched cruise missiles (see table 6.5).\(^1\) Four Triomphant class nuclear-powered ballistic missile submarines (SSBNs) form the backbone of France’s nuclear deterrent, complemented by nuclear-capable combat aircraft.

France maintains one SSBN on patrol at all times. While the second and third SSBNs can be put to sea rapidly, the fourth would take longer because of its cycle of extensive overhaul and maintenance. France is currently upgrading its SSBNs to the new M51 SLBM, replacing the ageing M45 missile. The overhaul of the four submarines is expected to be completed by 2019.\(^2\) As of early 2014, two submarines were each equipped with 16 M51.1 SLBMs. The second two submarines will be equipped with the M51.2 SLBM, an improved version of the M51.1. The first of the latter began this process in the summer of 2013 and is expected to return to service in 2016.\(^3\) The M51.2 is designed to carry the new Tête Nucléaire Océanique (TNO, Oceanic Nuclear Warhead) with a yield of up to 150 kilotons.\(^4\) France is also developing the M51.3, a future version of the M51 SLBM.\(^5\)

Government documents indicate that France is beginning preliminary development work on a third-generation SSBN, with the goal to have an operational successor SSBN to the Triomphant class by 2030.\(^6\)

On 5 May 2013 a test firing of a M51.1 SLBM failed and the missile self-destructed shortly after its launch in Audierne Bay, off Brittany, northwestern France. The French Ministry of Defence disclosed no information on the cause of the failure but stressed that the incident did not call into

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\(^4\) French Senate (note 2); and Lennox (note 2), p. 50.


question the credibility of the French nuclear deterrent and that all five previous launch tests of the M51.1 had been successful.7

The airborne component of the French nuclear forces consists of two types of land-based (Mirage 2000N and Rafale C F3) and one type of sea-based (Rafale M F3) nuclear-capable combat aircraft. The Mirage 2000Ns are scheduled to be replaced by Rafale B aircraft in 2019. The aircraft

7 ‘Le SNLE Le Triomphant en refonte’ (note 3).
are equipped with the Air–Sol Moyenne Portée–Améliorée (ASMP-A, Medium-Range Air-to-Surface–Improved) missile. A mid-life refurbishment programme for the ASMP-A is scheduled to begin in 2022. The missiles are armed with the Tête Nucléaire Aeroportée (TNA, Airborne Nuclear Warhead) with selectable yields up to 300 kilotons.

\(^8\) French Senate (note 2), p. 52.