

## Chapter 7

**FRANCE'S NUCLEAR STANCE:****INDEPENDENCE, UNILATERALISM AND ADAPTATION**Venance Journé<sup>1</sup>**Overview**

Since 1945, nuclear matters have been, in a very discreet way, at the core of major French policies, foreign and domestic, in the energy, industrial, and defense sectors. France has developed an advanced nuclear arsenal, although limited quantitatively, and official support for the French nuclear program has enjoyed a remarkable continuity. All along, the most authoritative French speakers have reiterated that French nuclear weapons are not for use—“not for a military purpose during a conflict.” In the years after the fall of the Berlin wall, like other nuclear weapon states, France reassessed its nuclear policy in the new international context: the hardware and doctrine have somehow evolved, and the possibility of nuclear weapon use is now more credible. Weapons have been made more flexible to take care of a wider range of circumstances and have been adapted for use in limited missions. Moreover, the nuclear program was developed in secret until 1958, and the legacy of secrecy has become a fact of nuclear life in France.

Equally consistent has been the response of French authorities to recent calls from a number of leading figures—many of them known as hardliners on nuclear issues—for real progress towards nuclear disarmament. The French authorities' response to the push for nuclear zero is that the nuclear deterrent is the best way to respond to nuclear proliferation and it will

remain at the core of France's security for the foreseeable future. The French response can be understood in the light of its policy of independence and autonomy and its specific history.

In this chapter, I will examine the evolution of the French nuclear weapons program. I will highlight the fact that disarmament or limitation measures have been carried out in a way that does not alter the French stance of deterrence. I will also discuss the absence of debate in France on the steps to be taken towards an abolition of nuclear weapons and conclude with some proposals for specific steps towards disarmament.

### **The Early Evolution of the French Nuclear Force**

French scientists played an important role in the early development of nuclear science, but they were not included in the Manhattan Project. Several French scientists did go to Canada, where they played a leading role in the Canadian nuclear program. On October 18, 1945, two months after the explosions at Hiroshima and Nagasaki, the French interim government presided over by General de Gaulle created by ordinance the French Atomic Energy Commission (CEA—*Commissariat à l'Énergie Atomique*). Its mission was to implement “all measures that can be helpful to benefit of the use of atomic energy in the field of Science, Industry and National Defense.”<sup>2</sup> The CEA was directly under the highest executive authority and had an unusual level of administrative and financial autonomy.

In the early years, domestic conditions were very unfavorable for the development of a military nuclear program. The Fourth Republic was very unstable and governments turned over frequently. Moreover, given the ongoing colonial wars in Indochina and Algeria, many decision-makers and the military did not favor embarking on a long-term program that would require

considerable financial and human resources. Most political parties shared this view; the general public was against nuclear weapons; and with very few exceptions, all the scientists in CEA were strongly opposed to any military use of nuclear energy. The international context was also unfavorable: specifically, the United States was against any other national program, and two civilian nuclear agreements, the European Defense Community and Euratom, were being negotiated in Europe.

Nonetheless, the French military nuclear program started in the early 1950s. From the beginning, the French military nuclear program was shrouded in secrecy. No head of government had taken a firm decision on the issue; nevertheless, the necessary facilities were constructed. On May 20, 1955, the Minister of Defense, Pierre Koenig, and the Minister of Atomic Affairs, Gaston Palewski, signed a secret memorandum of understanding explicitly giving CEA the responsibility for the development of nuclear weapons and allowing the secret transfer of funds from the Ministry of Defense to CEA. The work was always presented as “studies,” and the agreements between CEA and the Ministry of Defense were secret. Only the President of the Council of Ministers and a very few others involved knew about the real state of affairs.

In November 1956, the fate of the Suez military expedition and what it revealed about the lack of French power led to a real, but still secret, political decision to pursue the development of nuclear weapons. On November 30, 1956, a new protocol was signed which defined the objectives of a national nuclear weapon program: preparatory studies for nuclear explosives, manufacture of prototypes, and tests.

June 1958 marked a turning point in the French nuclear program: after thirteen years away from the public political scene, General de Gaulle came back to lead the French Republic.

De Gaulle was well informed about the nuclear work, and on July 22, 1958, he gave publicly a high priority to the nuclear bomb project. The time of clandestine operations had ended. Soon after, France became a nuclear power: the first nuclear A-bomb test was conducted in Reggane on February 13, 1960.

### **The Deterrence of “the weak to the strong”**

De Gaulle gave precedence to foreign policy over domestic affairs, and his diplomacy rested on “realpolitik.” He wanted France to participate in discussions as an equal with the “great powers,” and was convinced that military independence was the key to diplomatic independence. From the 1940s onward, de Gaulle was a strong proponent of an independent nuclear force. He understood that the nuclear weapon was also an equalizer, allowing a balance between powers with an unequal level of armament.

It should be underlined that an independent policy was not a given at the time. The nuclear policy of strict independence implied autonomy of effort, choice, and forces: it meant renouncement of foreign help and no sharing of resources with foreign countries because they could have different aims. Therefore: 1) France had to be free to decide when, how, and against which adversary the force would be used—the basis for the often misunderstood *tous azimuts* concept; 2) the French deterrence force had to be free from a military integrated command; and 3) France could not extend its deterrence to neighboring countries without undermining its concept of deterrence.

Beyond the policy of independence, several other reasons led de Gaulle early on to envisage French withdrawal from the NATO integrated military command: the U.S. opposition

to French nuclear forces; the obvious U.S. supremacy over Europe and the risk that France might be engaged in a war against her own interests; and the concern that relying too much on the United States might lead France to reduce its own defense efforts.

In 1957, the successful launch of Sputnik and the possibility that Soviet ballistic missiles could reach U.S. territory made it obvious that no U.S. president would risk a nuclear attack on U.S. soil to defend Europe. In 1962 McNamara's flexible response doctrine cleared the way for de Gaulle to reject NATO's responsibility to defend France and, in 1966, to withdraw the French forces from the NATO military integrated command.

The French deterrence force was initially meant to secure French vital interests—insuring the integrity of the national territory and the existence of the nation—against possible threats arising from a more powerful country. The original French nuclear policy was therefore strictly defensive, in order to prevent war. It was a deterrence “of the weak to the strong,” the strong being the USSR during the Cold War.

With limited means, the purpose was to have weapons in sufficient number so that enough would survive a first strike, and be able to inflict unacceptable damages out of proportion to the stakes in the conflict if vital interests were endangered. France has always maintained ambiguity in defining her vital interests, considering that it enhances deterrence because a possible adversary would have difficulty in assessing its margin for action.

Deterrence was the non-event: instead of comparing forces, the point was to compare the damage inflicted. During the Cold War, the French deterrence posture was an anti-city strategy, aimed at convincing the enemy (the USSR) that attacking France would not be worth the gain. It

was a straight and simple deterrence, but paradoxically, if it had ever been executed, France would have been wiped out.

Who is to decide? The Fifth Republic gives increased executive power to the President, who is “the person with the final word on our deterrent and the only one with the power to decide.”<sup>3</sup> As President Mitterrand has explained: “As a matter of fact, conditions in which France could have to reply to an aggression or a threat of aggression could leave only a few minutes. It is for this reason that, in principle, the head of the State decides, and decides alone.”<sup>4</sup>

### **A Forced March: The Construction of the Deterrence Force**

By the 1960s, the colonial wars were over, and it was possible to allocate substantial funds and manpower to the nuclear program. Although the French nuclear force was mainly intended for its political value, nevertheless it had to be militarily credible, with an advanced arsenal. Although not matching the numbers deployed by the superpowers, France developed a nuclear strategic triad, with surface, air, and submarine components, and including both strategic and tactical weapons.

The initial phases of the French nuclear force development met with three types of challenges: timing, finance, and technology.

Rapid development had the highest priority in order to close the technological gap with the other nuclear powers and to make the French nuclear force irreversible. The latter was necessary because of domestic opposition (Socialists, Communists, and Europeanists) and international opposition (the United States mainly), as well as pressure from disarmament

initiatives [Partial Test Ban Treaty negotiations and the start of the discussions for the Nuclear Non-Proliferation Treaty (NPT)].

Technological developments proceeded in three main areas:<sup>5</sup>

1) Making the force as invulnerable as possible. To insure the survivability of the second-strike launchers, the nuclear submarines were built early; construction of the *Redoutable* started in 1963.

2) Increasing the yield. Deterrence of “the weak to the strong” required the ability to inflict the maximum damage possible, and it led to the development of very powerful weapons of several megatons. After a troubled process, the first H-bomb was successfully tested in 1968.<sup>6</sup> The high-yield warheads were placed on surface-to-surface ballistic missiles situated on the Plateau d’Albion in the South of France.

3) Expanding the penetration power. In reaction to the U.S.-Soviet arms race, France developed a series of smaller weapons and of missiles with increasing range. In the late 1970s MIRV technology was mastered.

After the end of the Cold War, in the early 1990s, the authorities in CEA anticipated that the Comprehensive Test Ban Treaty (CTBT) being discussed at the time would prevent any more testing in the future. In order to ensure the maintenance of the weapons, or even to build new weapons in a nuclear test prohibition regime, France launched a simulation program.

#### *Low Yield Weapons and ultime avertissement*

The original deterrence policy was strictly defensive, excluding military use on the battlefield, and thereby giving nuclear weapons solely a political role. With French withdrawal

from NATO military integrated command, however, the French authorities knew that their forces stationed in Germany would be deprived of NATO's tactical nuclear weapons. De Gaulle decided in 1966 to build tactical weapons. Once France had developed a triad with strategic and tactical weapons, and given that it was not possible to exclude a foreign invasion of French territory, it was tempting to conceive of a possible use for nuclear weapons. This was true, in particular, for the short-range, low-yield weapons for use on the battlefield outside of French territory. Weapons of a yield of 30–40 kilotons were developed and installed on the Pluton (deployed from 1974) and then the Hadès ground-ground missiles, until 1993. These missiles had a very short range—120 and 450 kilometers.<sup>7</sup>

The use of these tactical weapons was then conceptualized. They were supposed to serve as an *ultime avertissement* (“final warning”). This final warning was intended to show the adversary the determination of the French through limited nuclear strikes on military targets. If, unfortunately, the adversary did not understand and stop, then, during the Cold War, this *ultime avertissement* would be followed by a massive strike on Soviet cities. The tactical weapons were later called “prestrategic,” a term meant to imply that their use would be part of the strategic deterrence.

Understandably, these short-range weapons raised immense concern in Germany, since they were supposed to be used to stop the possible advance of Soviet ground forces towards France. After years of major controversies with the Germans (in particular on what form consultation with the Germans would take in case of a French decision to use the tactical weapons on German soil), the French devised a policy to use airborne missiles to send the final warning on the soil of the aggressor.



After the fall of the Berlin Wall in 1989, nuclear proliferation took precedence over past concerns. The new perceived threats originated from far-away countries with a lower level of armament. In 1993, the surface tactical missiles were withdrawn from the inventory, and the *ultime avertissement* was assigned to the 300 km range missiles based on aircraft.

### *French Nuclear Forces as of 2008*

[Table 8-1 around here]

The current French nuclear forces are shown in Table 1. They comprise four aircraft squadrons (one carrier-based) and a submarine fleet, which has undergone modernization: the new class of submarines is much quieter than the previous class, quieter even than the background ocean noise. The Mirage and Super Etendard aircraft will be retired as the Rafale are introduced.

Missiles have also been modernized. The new M51 missile scheduled to replace the M45 in 2010 will have a range of 6000 km with the nominal charge, and could reach 9,000–10,000 km if it carries fewer warheads. In 2015, the M51 missile will be modified to be able to carry the new TNO warhead (*tête nucléaire océanique*, oceanic nuclear warhead) that will replace the TN-75 warheads. In 2010, the ASMP missile (*à Air-Sol Moyenne Portée*: medium-range air-to-surface missile) will be replaced by advanced missiles (ASMP-A), with a range of 500 km, better precision—10 meters—and the new TNA warhead (*tête nucléaire aéroportée*, airborne nuclear warhead). The TNO and TNA are the new generation of the so-called “robust” weapons. The last series of tests conducted in 1995–1996 was precisely devoted to validating this concept.

French nuclear weapons have a life time of about 20 years. Robust warheads and simulation programs are the tools for the renewal of the nuclear warheads. The simulation program is intended to give the capacity to validate new nuclear weapons at a cost 40 percent lower than the costs of the nuclear tests.<sup>8</sup> The simulation program includes a high-power laser, a radiography system (to analyze the dynamics of materials and study the non-nuclear parts of the weapon), and a parallel computing system. The Megajoule laser, which is being built in Le Barp near Bordeaux, will be equipped with 240 beams and will allow the study of the nuclear fusion processes. The first ignition and combustion experiments are foreseen in 2011. The simulation program will also study aging phenomena in the weapons, and work to insure the validity of certain parameters for robust warheads. Finally, this program aims to maintain scientific excellence and competence in nuclear weapon design for scientists who have never participated in real tests.

### **The New International Context and French “Disarmament” Measures**

After the discovery of the Iraqi nuclear program in the early 1990s, the risks of proliferation took precedence over past security concerns and induced France to implement several significant measures of armament reduction. France ratified the NPT in 1992, and in April 1992 President Mitterand announced a unilateral moratorium on nuclear testing. The moratorium initiative was conceived as a proposal to the other nuclear weapon states as a first step, to be followed by them, towards a comprehensive test ban. At the same time, however, CEA was initiating the development of the simulation program PALEN [Préparation à la limitation des essais nucléaires (Preparation for the limitation of nuclear testing)], which is, as

was stated by Mitterrand, dedicated to “obtain a full simulation that will enable the development of the weapons that [France] will need in the year 2010.”<sup>9</sup>

Several other measures were decided at this time:

- Reduction of the alert level for the strategic forces;
- Early retirement, in 1992, of the short-range surface-to-surface Pluton missiles;
- Reduction of the short-range surface-to-surface Hadès missiles program, from 120 to 30 units, and a decision not to deploy them;
- Reduction of the number of new-generation nuclear submarines from six to five, and the staggering of the commissioning schedule;
- Halting in 1992 the production of plutonium for nuclear weapons at the Marcoule separation plant.

However, President Mitterrand decided to maintain the surface-to-surface strategic M4 missiles of the Plateau d’Albion until 2005, the date at which they would be replaced by the M45 missile.

The two last years of the Mitterrand presidency were marked by a period of political “cohabitation.” In 1993 a conservative majority was elected in Parliament, and in the mid-1990s recurrent discussions occurred on the need to adapt the nuclear deterrent to the emerging threats and to the increasing number of conflict zones. In February 1994 the Defense Committee of the French Parliament presented a report on military programming that supported a policy of extended deterrence, which would allow France to defend its vital interests with the possibility of limited and very precise nuclear strikes, a strategic choice that implied resuming nuclear testing and giving up the simple concept of deterrence of the weak to the strong.<sup>10</sup>

Mitterrand had converted to nuclear deterrence earlier in his political career, in the most Gaullist fashion. In the 1980s, faced with different modernization choices, he had clearly made a choice to “perfect the apocalypse” and to stick to the original deterrence concept.<sup>11</sup> In 1994 President Mitterrand gave a speech in Parliament in which he reaffirmed his views on the deterrence doctrine and opposed what he considered as “potential drifts away from the initial concept” and the emerging hypothesis according to which nuclear weapons could be used against “the weak or the mad.” He denounced the “major heresy” that would lead to a doctrine of use: “Would it be necessary to come round to the use of so-called surgical strike, or even more picturesque, a decapitating strike, which could after all go down to the nuclear rifle. This seems to me a major heresy, and, in no circumstance, would I accept it.” To remove this temptation, he limited the magnitude and the diversity of weapon systems.<sup>12</sup>

In May 1995, with Jacques Chirac elected President, the proponents of a resumption of nuclear testing gained a sympathetic listener in the Elysée. Following the final round of five tests, Chirac decided on the following measures:

- Support for the Comprehensive Test Ban Treaty with a zero yield. France ratified the treaty in April 1998;
- Irreversible dismantlement of the test site in Mururoa, completed in 1998;
- Ratification of the Pelindabada and Roratonga treaties in 1996;
- Dismantlement of the ground-launched nuclear missiles on the Plateau d’Albion, decided in 1996;
- Definitive retirement of the Hadès missile (the last one was dismantled in 1997);
- Abandonment of the alert level;

- Reduction in the number of submarines permanently at sea to one;
- An end to the production of highly enriched uranium for nuclear weapons in the enrichment facility of Pierrelatte;
- Dismantlement of the production plants in Pierrelatte and Marcoule;
- Reduction of French strategic forces to 350 weapons.

In Cherbourg in March 2008, in a speech presenting *Le Terrible*, the fourth nuclear ballistic missile submarine of the second generation, scheduled to enter service in 2010, President Sarkozy announced further reduction measures: the total number of nuclear weapons would be reduced to fewer than 300 weapons. For the airborne component, the number of nuclear weapons, missiles, and aircraft were to be reduced by one-third (to 40 aircraft Rafale, which are currently being produced). This measure came in a time of budgetary restraint: according to the Ministry of Defense, 30 billion Euros will be missing in the defense budget between 2009 and 2013, if the current rate of spending is maintained.<sup>13</sup>

In his speech, the French President also made a prominent call to “the eight nations in the world which have declared they have conducted nuclear tests”—a way to include North Korea but not Israel—for “the immediate launching of negotiations on a treaty to ban the production of fissile materials for nuclear weapons purposes, and to establish without delay a moratorium on the production of such materials” for “opening negotiations on a treaty banning short- and intermediate-range surface-to-surface missiles.”<sup>14</sup> And, as a measure of transparency, international experts from 40 countries were invited in September 2008 to see for themselves the effective dismantlement of the facilities in Marcoule and Pierrelatte.

In recent years French official speakers have frequently praised the example of France in the matter of nuclear disarmament.<sup>15</sup> It should, however, be underlined that none of these measures have altered the French nuclear stance, and the modernization programs continue. The reductions in numbers have been made in order to reach “strict sufficiency” for the French nuclear arsenal. Most of the disarmament measures appear to be for the purpose of rationalization—including financial rationalization. The short-range weapons were retired when it became obvious that their use was truly inconceivable. The moratorium and then the end of nuclear testing came when the French nuclear weapon community determined that it would be possible to continue the weapon development through the simulation program. The fissile material production centers were shut down when France had accumulated sufficient weapons-grade material for foreseeable future needs.<sup>16</sup> The opening up of the military fissile material production sites was a gesture to show the “French commitment to disarmament and transparency” before the NPT Review Conference in 2010 and the resumption of the work of the Conference on Disarmament in Geneva.

Arguably, the French disarmament measures are most welcome. Some of them are irreversible, in particular the dismantlement of the nuclear testing facility. France is the only country to have dismantled totally its nuclear test site, with no way to reconstruct it. Nevertheless, it should be underlined that all these measures have been taken unilaterally—and that in parallel, France is pursuing an extensive modernization program. As far as reductions are concerned, France refuses multilateral constraints.<sup>17</sup> In multilateral fora, France agrees to discuss only the CTBT and Fissile Material Cutoff Treaty (FMCT).

### **Adaptation Toward Flexibility**

The positive changes in international security after the end of the Cold War were underlined in the 1994 White Paper (WP), but nuclear deterrence remained—and still is—the basis of French defense policy and a major element of French independence. The 1994 WP noted that new scenarios involving regional powers must be envisaged, and rejected any mix-up between deterrence and use, but nevertheless reaffirmed the *ultime avertissement*.<sup>18</sup> The more powerful enemy that French nuclear forces were supposed to deter had vanished, but scenarios justifying a “strictly sufficient” (but nevertheless significant and modernized) nuclear force proliferated. To address the diverse threats to vital interests in a changing world, with threats of varying degree of danger and coming from different regions, France’s strategy is to implement an “adapted” response, with the possibility to strike selectively with means which are made more flexible in order that their use would be credible.

French authorities realized that nuclear deterrence aimed at Russia was no longer sufficient, and the doctrine was adjusted to take Asia into account. The new missiles have a range greater than 9000 kilometers. At the end of the 1990s and the beginning of the 2000s, prompted by a discussion of a new nuclear doctrine in the United States and nuclear proliferation-related events (the Indian and Pakistani nuclear tests, undetected proliferation in Iraq, the North Korean crisis), President Chirac once again described nuclear deterrence as having the most important role in French security policy<sup>19</sup>

President Chirac gave a major speech in January 2006. He insisted that the deterrence principles underlying French nuclear doctrine had not changed: “There is no question, under any circumstances, of using nuclear means for military purposes during a conflict.” But a few words

later, he added: “This formula should not, however, allow any doubts to persist about our determination and capacity to resort to our nuclear weapons.”<sup>20</sup> The ambiguity is clear.

Several scenarios have been spelled out for the role of nuclear weapons:

- 1) As “life insurance” to deter the big powers, in particular China.
- 2) To deter the regional powers, the “proliferators,” from threatening French vital interests with weapons of mass destruction—not only nuclear weapons.<sup>21</sup>
- 3) To deter state-sponsored terrorism.<sup>22</sup>
- 4) To deter more limited threats. The question of protecting the right of French troops to intervene outside of French territory and to resist blackmail was mentioned by the Chief of the Defense Staff, Général Henri Bentégeat.<sup>23</sup> Of course the stakes would be limited. France’s survival would not necessarily be at stake, so to be credible the threat to use nuclear weapons should be adapted to the level of nuisance.

France has always maintained ambiguity on the definition of vital interests, as she considers that to do so enhances deterrence, which is necessary in order to “preserve the freedom of assessment and action”<sup>24</sup> of the authorities. The vital interests are not specified in detail, nor is the frontier between strategic and vital interests.<sup>25</sup> In his January 2006 speech, President Chirac, however, broke with this tradition stating that the list includes “safeguarding our strategic supplies and the defense of allied countries,”<sup>26</sup> and the Defense Minister added a few days later that the “list goes beyond the European Union.”<sup>27</sup>

In his 2008 Cherbourg speech, President Sarkozy remained vague in the definition of vital interests and gave fewer details than his predecessor, but he did not contradict him.:



Our nuclear deterrence protects us from any aggression against our vital interests emanating from a state—wherever it may come from and whatever form it may take. Our vital interests, of course, include the elements that constitute our identity and our existence as a nation-state, as well as the free exercise of our sovereignty. My responsibility, as Head of State, is to assess their limit at all times, for in a changing world they cannot remain static.<sup>28</sup>

There is some dissent: General Lucien Poirier, one of the main thinkers on the French deterrence concept, maintains that the vital interests should be defined very strictly, and that they are limited to the protection of the “national space.”<sup>29</sup> General Poirier disagrees with the present stance of ambiguity on the nature of the vital interests, and asserts that the only ambiguous element should be the time when it is considered that vital interests are threatened.

A major inflection in the deterrence concept and in the adaptation of the means<sup>30</sup> was announced by President Chirac in 2001 and was clarified in 2006. French policy is to deter regional powers, not by an anticipated threat against populations, but by a precise threat to destroy the major government, army, or even economic centers of a country. The nuclear forces have been configured accordingly; for example, the number of nuclear warheads has been reduced on some of the missiles.<sup>31</sup> This reduction was explicitly made to increase the credibility of the use of the weapon.<sup>32</sup> Decided very discreetly, the change was implemented in 2003.<sup>33</sup>

French authorities, such as the Ministry of Defense and the Chief of the Defense Staff, are convinced that these limited and precise strikes would involve very limited collateral damage.<sup>34</sup> As expressed by the Chief of the Defense Staff: “The credibility of our threat against these regional powers implies that the population losses be kept limited if we want that our

adversary takes it into consideration . . . in western public opinions, it would be unimaginable to announce that, in retaliation to a missile which killed one thousand persons in Paris, we decide to strike a regional power killing millions of people. To be able to destroy centers of power, we possess very precise weapons with a variable yield to avoid collateral damages, without having built miniaturized weapons.”<sup>35</sup>

This argument is now enshrined in the most recent White Paper, now called “White Paper on Defense and National Security,” which was published in June 2008. Among the adapted responses, the White Paper adds also the ability “to paralyze an adversary’s capacity for action.”<sup>36</sup>

This credible use, consisting in the capacity to strike precisely with weapons of a lower yield, has a concept attached: the *ultime avertissement*, now also called the *avertissement nucléaire*. Officially it is argued that the long-lived concept of *ultime avertissement* remains essential to avoid locking the President into a two-prong alternative: everything or nothing. A limited strike such as the *ultime avertissement* seems to be the major element of a flexible response. In 2006, the Minister of Defense Alliot Marie emphasized the fact that the *ultime avertissement* is at “the core of the deterrence doctrine”<sup>37</sup> On the link between the *ultime avertissement* and ultimate deterrence, General Bentégeat explained:

A reason why it is imperative to think in term of *ultime avertissement* is that, toward regional powers, it may be necessary to restore deterrence. If they have not understood that nuclear deterrence can hit the core of their vital interests, it is necessary to make them understand in a way or in another, and nothing can better do it than the *ultime avertissement*.<sup>38</sup>

The *ultime avertissement* could consist of limited strikes with nuclear-equipped ASMP missiles from aircraft or of a strike with a strategic missile with a reduced number of warheads launched from a submarine. Or, the final warning could instead be an electromagnetic pulse produced by a nuclear explosion in the high atmosphere. In October 2006 General Bentégeat explained that the explosion of a nuclear weapon at an altitude of several tens of kilometers would create an electromagnetic pulse resulting, “within a definite radius,” in the destruction of all electromagnetic and computing devices, “without any blast or radioactive effect on the ground.”<sup>39</sup> The threat of such a use would represent, among all the possibilities for *ultime avertissement*, the least destructive mode.

Although the authorities always stress that such a flexible use of a nuclear weapon does not mean a lowering of the nuclear threshold, the discourse remains very unclear, including on such points as the possibility of preventive strikes or the modalities of the assessment of the hostile intentions of a potential aggressor, which could be misinterpreted. In his speech, Chirac was ambiguous, but a military decision-maker explained that with such an electromagnetic use for the nuclear weapon “one loses in deterrence but one gains in use.”<sup>40</sup>

In any case, several important issues remain: Instead of protecting anything, such a use—if really meant to protect the vital interests—would rather prove that deterrence had not worked. Nothing guarantees that the opponent would be convinced, unless this final warning were to annihilate him completely, as well as his army. The consequences of the *ultime avertissement* are in any case very difficult to assess, and there is a big risk that they may prove more catastrophic than the threat the warning is suppose to erase.

Thus, since the mid-1990s, there have been “major inflections” in the original French deterrence concept, shifts that have been justified by new perceived threats. The doctrine has been adapted in three major ways: deterrence of the “weak to the strong” has become the deterrence of the “strong to regional powers”; the anti-city strategy has become anti-centers of power, with the main parameter being a modulated impact; and the vital interests have been expanded.<sup>41</sup> This was recognized by President Chirac in a rather ambiguous formulation: “Thus the principles underlying our deterrence doctrine remain unchanged, but the modalities of expressing this doctrine have evolved and keep evolving,”<sup>42</sup> and by many political and military figures.<sup>43</sup> These changes, which were decided very quietly in the late 1990s, have never been discussed publicly, including in the Parliament.

### **The Lack of Public Debate on Nuclear Military Issues**

The main control over French nuclear affairs remained, and still remains, with the CEA. Such centralized control has facilitated the policy of secrecy. The relations between CEA and the government's leaders are very close, and CEA is the only body that gives advice to the government on nuclear weapons technology. For example, in May 1995, newly-elected President Chirac asked CEA to make a report on the various possibilities to guarantee the long-term reliability of the French deterrent, and CEA prepared the decision to resume nuclear tests. Moreover, CEA regularly makes proposals on technological choices. This has been the case for the thermonuclear bomb, tactical weapons, and the MIRV, among others.

Beginning with de Gaulle's enthusiastic support for the deterrence force, there has been overall continuity of policy under every French president, with no reservation. The Socialist

Party was opposed to the French nuclear deterrent until 1978, when it realized that Mitterrand could be elected president. The first political leader to change his mind on this issue was Michel Rocard, who was Prime Minister during the period 1988–1991. When he participated in the Canberra Commission, Michel Rocard became convinced of the necessity to get rid of nuclear weapons.<sup>44</sup> Such a rare event—a former French Prime Minister contesting the validity of maintaining a nuclear arsenal—went almost unnoticed in France.

Yet very recently a national *première* happened on the French scene: four leading figures—two former prime ministers: one conservative, Alain Juppé, and one socialist, Michel Rocard; a retired Air Force general, Bernard Norlain, who had been chief of the military cabinet under two Prime ministers, Chirac and Rocard; and a former defense minister, the socialist Alain Richard—published in a major newspaper a call for France to engage radically in the Global Zero process.<sup>45</sup> A leading French defense journalist reacted promptly: “For Paris, the only efficient measure presently consists in strengthening the anti-proliferation measures, and there is little chance that the text written by the two former Prime Ministers would lead to any evolution.”<sup>46</sup>

There is no reason to foresee any change in the official position. Apart from the “French Four,” all the voices on the political or military scene—and in the media—argue in converging ways for a continuing deterrent, and there is no lack of extreme scenarios to justify this position. The nuclear weapon is still for France a “weapon of political status.”<sup>47</sup> From the beginning, the nuclear weapon was primarily an instrument of independence and grandeur, rather than of pure military value. Although there have been some real shifts in the military value associated with the nuclear weapon, the argument of sovereignty and international status is even today of utmost

importance. In 2008 the President stated that the nuclear force “is neither a matter of prestige nor a question of rank,”<sup>48</sup> but in many other instances, the nuclear weapon is referred to as a sign of global importance: a weapon “which sets the size of the international status of our country,”<sup>49</sup> which is also an “essential element of international status for our country, recognized by the NPT,”<sup>50</sup> making France “a nation which counts and is listened to on the international scene.”<sup>51</sup> The nuclear force is also seen as an indispensable attribute of a permanent member of the UN Security Council and increases in importance with regard to a potential extension of the members.<sup>52</sup> And finally, in the eventuality of a decrease of the U.S. presence in Europe, the role of the French nuclear force could be enhanced.<sup>53</sup>

In French decision-making circles, it is assumed that non-proliferation policies and nuclear deterrence are not contradictory and that, as a matter of fact, they reinforce each other.

[D]iscouraging a potential adversary, deterrence contributes to non proliferation, and the French refusal of a no-first use stance is part of this logic. . . . Adopting a *tous azimuth* deterrence, France exercises indirectly a conflict prevention action outside its borders, contributes to reinforce security in France and in Europe. . . . Since nuclear weapon will never be eradicated from the planet, non proliferation actions do not aim at prohibiting it, but to insure compliance in the Non Proliferation Treaty, which limits its possession to a restricted club of five countries.<sup>54</sup>

For many officials, the best argument to oppose the thesis that it is the lack of disarmament which drives proliferation, is that proliferation continued in the 1990s, while the nuclear powers were “disarming” and that this, by itself, is a proof that disarmament is not a good strategy to promote non proliferation.<sup>55</sup>

The January 2007 *Wall Street Journal* op-ed and the recent declarations by President Obama in April 2009 have forced some reactions and comments in France on the possible elimination of nuclear weapons. Essentially, the comments unanimously reassert the need for a French nuclear deterrent.<sup>56</sup> In a recent paper, for example, two retired diplomats, Rose and Debouzy, argue that it would be dangerous not to maintain the status-quo.<sup>57</sup>

The reluctance of French officials to openly discuss the possible abolition of nuclear weapons is mirrored by the fact that any public discussion on nuclear deterrence is still taboo in France. Voices that challenge the soundness of the nuclear deterrence policy exist but are seldom heard in France, in part because of self-censorship of the media. It may happen that some rather quiet voices speak in favor of the elimination of nuclear weapons, but they are swiftly ridiculed by members of the establishment. Michel Rocard restated in 2008 his stance in favor of the elimination of nuclear weapons.<sup>58</sup> The answer was: “One is left confused by so much thoughtlessness.”<sup>59</sup> The October 2009 op-ed by Juppé, Norlain, Richard, and Rocard has not led to any debate.

There is also very little debate on the tools of nuclear deterrence or the modernization program. In the UK, the Trident modernization programs did eventually lead to extensive public discussions. In France, by contrast, the weapons modernization programs have proceeded in relative secrecy until the test phase. Some members of the military establishment would prefer to allocate funds to conventional armaments better adapted to the present tasks rather than to the nuclear program, especially in a period of financial scarcity,<sup>60</sup> but this kind of debate may occur only behind closed doors.

It is therefore surprising that regrets concerning the lack of debate are sometimes echoed in official fora<sup>61</sup> from those who should foster, or at least authorize, the debate.<sup>62</sup> The Chief of the Defense Staff regrets that, “[t]he debate about nuclear deterrence is currently quite poor.”<sup>63</sup> The fact is that France is unwilling to provide information on the nuclear deterrent, which is a “non-topic.”<sup>64</sup> One clear example is the collision between a UK and a French nuclear submarine which occurred in February 2009. The French Navy initially claimed the submarine had been in a collision “apparently with a container.”<sup>65</sup> The real reason for the damage of the French submarine was only revealed after the UK made the collision public. A responsible official from the French Ministry of Defense states: “In France, deterrence is reserved to a club of big priests. The Fifth Republic system is based on the idea that the Parliament should not debate about strategic questions, which are the prerogative of the executive.”<sup>66</sup>

French authorities always insist that there is a consensus on nuclear deterrence. A political consensus has existed since 1978, when the Left came round to the French deterrent; all the political parties, apart from the Greens, do not question this issue. But even in political circles, it is a consensus by lack of information and therefore lack of debate. There cannot be any public consensus, since the public is not informed.

## **Conclusions**

In the four decades of its existence, The French nuclear program and posture have undergone major changes in form and in justification.

French authorities consider it irresponsible to argue that nuclear disarmament and non-proliferation are two sides of the same coin. On the contrary, the general motto is that



“deterrence constitutes still today the most efficient strategy to oppose [proliferation] or at least to protect from it.”<sup>67</sup> The September 2009 declaration of the French President at the United Nations reaffirms this position.<sup>68</sup> One might argue that nuclear proliferation gives France the best motive for a modernization of its arsenal and eases the task of justifying its weapon developments.

The changes in the international context, in domestic politics, and in the modernization programs have led to significant drifts in posture, which are not acknowledged as such by the French decision-makers or “official” analysts. France points out that, in the past and most recently in 2008, it has made cuts in its nuclear forces and structures. These measures, however, have not and do not have logical corollaries in shifts in French nuclear doctrine. On the contrary, the unilateral armament reduction measures have been accompanied by modernization measures designed to render the arsenal more efficient, more precise, more accurate, and longer lasting. This cannot be explained simply by the inertia of decade-long programs, since the threshold for use has explicitly been lowered with the introduction of the new technology. The trend has been to substantially lower the threshold for triggering the use of nuclear weapons. A strict dividing line between deterrence and use, and the obvious development of a more versatile arsenal, are hardly compatible.

Nuclear weapons now can be given missions that conventional weapons could also fulfill with far less collateral damage. Most decision-makers have stated that the modernized weapons are not battlefield weapons; nevertheless, they are made more and more usable. Moreover, as the official view seems to be that the collateral damage would be minimal, it is undisputable that the taboo against use of the weapons is weakened. While some military officers have argued that

even a surgical strike would have indiscriminate effects<sup>69</sup> the nuclear taboo is even more weakened when the use of nuclear weapons is conceived as a mean to “paralyze the capacity of action of the opponent.” It cannot be excluded that the use of nuclear weapons to produce an electromagnetic pulse would push France towards a preventive strike.

This risk is aggravated by the fact that there is hardly any public information and no real debate in France on nuclear military matters or choices. The general public is not aware of the nuclear policy in general or of the potential shifts in the French nuclear posture. The general public is not at all prepared for the eventuality of such decisions as launching the *ultime avertissement*, and even less for the possible reactions from adversaries. If there is no public debate, maybe one reason could also be the fact that “one should have the courage to speak in terms of Hiroshimas not only in the camp of the adversary but also in our own.”<sup>70</sup> All this for the sake of a paradoxical logic.

It is often said in France that the two major nuclear powers, Russia and the United States, should take the lead. Their huge arsenals are of course a main concern, but new studies of a limited nuclear exchange have shown that any country equipped with some dozens of weapons poses a global threat.<sup>71</sup> Therefore any move toward real disarmament by those countries with small arsenals would have important consequences in reducing the danger of their use and in delegitimizing nuclear weapons. An example of such a move happened when South Africa gave up its nuclear armament, although its arsenal was very limited. This led to the entry into force of the Pelindaba Treaty.

The middle nuclear powers, France and the UK could take several short-term measures on their own initiative without waiting for agreement among Russia and the United States.<sup>72</sup>

1) The calls for the elimination of nuclear weapons seldom express the logical conclusion of their assertions, i.e., that it is not possible to convince other countries that nuclear weapons are not in their interest if the nuclear doctrines and weapon system modernization programs are not changed accordingly. France and the UK should publicly renounce their first-use policy, specify what they consider to be their vital interests, and renounce the modernization of their warheads and missiles. France should dismantle the airborne component, which is the essential element of the *ultime avertissement*, and decrease further the number of weapons placed on the submarines.

2) A verifiable elimination of nuclear weapons is a critical element of a nuclear weapon free world. Britain and a non-nuclear weapon state, Norway, have begun a collaboration on developing new technologies, methods, and procedures. France, as well as other countries, both nuclear and non-nuclear weapon states, should join in this endeavor.<sup>73</sup>

3) There is no alternative to global multilateral negotiations on complete nuclear disarmament. France and Britain should put the issue of a Nuclear Weapon Convention on the international agenda now. In a first step, France and Britain should convene a conference to study all aspects—technical and political—of the design of this Convention, considering a time horizon in the range of years and not decades for the conclusion of the Convention. The organization of this conference should be open, and participation as wide as possible should be encouraged: at least all nuclear-equipped states, as well as the countries having civilian nuclear ambitions, should participate. Last but not least, the conference should provide for the meaningful participation of members of the civil society, including independent scientists and experts.

The dialog on Nuclear Zero should move away from its western-centrism and consider the security assurance needs of the other countries. Outside Europe and the affluent West there is a widespread feeling that the West wishes to use its military force to politically dominate the world, and that it analyzes and reacts to the world developments only according to its narrow and short-term interests and those of its allies in order to maintain its economic superiority and secure its access to strategic supplies. Some countries, such as Iran or Brazil, may feel threatened, as they possess important natural and energy resources that they want to protect.

Moreover, the unwillingness of the nuclear powers to implement their own commitments does not give them any international legitimacy to require new constraints from other countries, such as more intrusive inspections or possible limitations in national development or access to sensitive but permitted technologies, such as uranium enrichment. The variable norms in nuclear policies between “friendly” and “unfriendly” proliferators can only lead to bitter feelings in the populations of other countries, as well as their governments, which may, with the support of their people, refuse control measures, such as the International Atomic Energy Agency (IAEA) Additional Protocol, or may lead to policies that reduce transparency. Western leaders should realize that only multilateral agreements that are global and truly non-discriminatory have a chance of bringing stability in the long run.

## Endnotes - ch. 7

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<sup>1</sup> This chapter will appear in French as “La dissuasion française en évolution” in my book *Désarmement nucléaire et moyennes puissances* (L’Harmattan, forthcoming fall 2010), and is included here by permission of L’Harmattan.

<sup>2</sup> Ordonnance no 45-2563 du 18 octobre 1945 portant création du Commissariat à l’énergie atomique (CEA).

<sup>3</sup> “Intervention de M. François Mitterrand, Président de la République, sur la politique de défense de la France et la dissuasion nucléaire,” Paris le 5 mai 1994, at <http://lesdiscours.vie-publique.fr/pdf/947007300.pdf>.

<sup>4</sup> Mitterrand, 1994.

<sup>5</sup> Jean-Damien Pô, *Les moyens de la puissance. Les activités militaires du CEA, 1945-2000*. Ed. Ellipses marketing, 2001.

<sup>6</sup> Billaud, Pierre and Journé, Venance (2008) “The real story behind the making of the French hydrogen bomb,” *Nonproliferation Review* 15, no. 2, 353–72.

<sup>7</sup> White Paper on Defense, 1972, at [http://www.vie-publique.fr/documents-vp/livre\\_blanc\\_1972.shtml](http://www.vie-publique.fr/documents-vp/livre_blanc_1972.shtml), indicates that conventional weapons were closely associated with nuclear weapons on the battlefield in case the Soviet forces would march towards Western Europe.

<sup>8</sup> Sénat 2005, avis 77, at <http://www.senat.fr/rap/a04-077-4/a04-077-48.html>.

<sup>9</sup> Mitterrand, 1994.

<sup>10</sup> Pô, 2001, p. 219.

<sup>11</sup> <http://www.vie-publique.fr/chronologie/chronos-thematiques/politique-defense-loi-programmation-militaire-autre-1994-2007.html>.

<sup>12</sup> Mitterrand, 1994.

<sup>13</sup> Alain Ruello “Ces milliards qui manquent à la Défense,” *Les Echos*, 16 Juillet 2007.

<sup>14</sup> French President, Cherbourg, 2008.

<sup>15</sup> NPT Prepcom Conference, New York, Mai 4-15, 2009, Speech by Eric Danon, French ambassador to the CD.

<sup>16</sup> According to Charles Million, French Defense Minister (1995–1997), “France has a fissile material stock sufficient for the next fifty years” and “beyond these fifty years, we will know how to recycle the materials currently employed in our nuclear weapons.” Quoted in Global Fissile Material Report 2008, “Banning the Production of Fissile Materials for Nuclear Weapons: Country Perspectives on the Challenges to a Fissile Material (Cutoff) Treaty,” p. 15.

<sup>17</sup> Présentation devant l’Assemblée nationale, par M. François Léotard, ministre de la défense, du projet de loi de programmation militaire 1995–2000, 24 mai 1994, at <http://www.vie->

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publique.fr/chronologie/chronos-thematiques/politique-defense-loi-programmation-militaire-autre-1994-2007.html.

<sup>18</sup> White Paper on Defense, 1994, at

<http://lesrapports.ladocumentationfrancaise.fr/BRP/944048700/0000.pdf>, p. 52–57.

<sup>19</sup> Speech of French President Chirac at the Institut des Hautes Etudes de Défense Nationale, 8

June 2001, at <http://www.cedoc.defense.gouv.fr/-Politique-de-defense-Strategie->. “I am

convinced that in the long run our security will rest on three fundamental and complementary pillars: respect for the rule of law, the modernity and Europeanization of our defense capability,

and permanence of nuclear deterrence . . . our security is and will be guaranteed first and

foremost by nuclear deterrence. This is true today and will be even more so tomorrow. . . .

Nuclear deterrence is above all an important factor of global stability.”

<sup>20</sup> Speech by Jacques Chirac, President of the French Republic, during his visit to The Strategic

Air and Maritime Forces at Landivisiau / L’Ile Longue, 19 January 2006, at

<http://www.cedoc.defense.gouv.fr/-Politique-de-defense-Strategie->.

<sup>21</sup> French President, Cherbourg, 2008.

<sup>22</sup> Chirac 2006; Audition de Mme Michèle Alliot-Marie, Ministre de la Défense, sur la dissuasion

nucléaire française, Commission de la Défense Nationale et des Forces Armées, Compte Rendu

N° 21, Mercredi 25 janvier 2006, at <http://www.assemblee-nationale.fr/12/cr-cdef/05->

[06/c0506021.asp#TopOfPage](http://www.assemblee-nationale.fr/12/cr-cdef/05-06/c0506021.asp#TopOfPage).

<sup>23</sup> Dissuasion, Henri Bentégeat, in *Défense nationale et sécurité collective*, n°8-9, août-septembre 2004, p. 11.

<sup>24</sup> White Paper 1994, p. 24.

<sup>25</sup> *Ibid.*, p. 25.

<sup>26</sup> Chirac, 2006.

<sup>27</sup> Alliot-Marie, janvier 2006.

<sup>28</sup> French President, Cherbourg, 2008.

<sup>29</sup> Lucien Poirier: “Je crois en la vertu rationalisante de l’atome” *Le Monde*, 27.05.06.

<sup>30</sup> Général Bentégeat, in “Rapport d’Information sur le rôle de la dissuasion nucléaire française aujourd’hui,” Serge Vinçon, Sénat, octobre 2006, at <http://www.senat.fr/rap/r06-036/r06-0361.pdf>, p. 24.

<sup>31</sup> Chirac 2006.

<sup>32</sup> Alliot-Marie, 2006. “The French President has underlined the fact that our country has made more flexible its capacities of action and has now the possibility to target decision centers of a possible aggressor, avoiding in this way an overspread of fallout which might make us hesitate.”  
[Le Président de la République a souligné que notre pays a assoupli ses capacités d’action et a



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désormais la possibilité de cibler les centres de décision d'un éventuel agresseur, évitant ainsi les retombées trop générales susceptibles de nous faire hésiter.]

<sup>33</sup> Laurent Zecchini, "La guerre nucléaire propre," *Le Monde*, 2 March 2006.

<sup>34</sup> Alliot-Marie, 11 janvier 2005, quoted in Isabelle Lasserre, "La France Modernise Sa Dissuasion Nucleaire," *Le Figaro*, 14/01/2005.

<sup>35</sup> La dissuasion nucléaire: quel rôle dans la défense française aujourd'hui?, Sénat, Rapport d'information n° 36 (2006–2007) de M. Serge VINÇON, fait au nom de la commission des affaires étrangères, déposé le 24 octobre 2006, at [http://www.senat.fr/rap/r06-036/r06-036\\_mono.html](http://www.senat.fr/rap/r06-036/r06-036_mono.html) Bentégeat, p. 24.

<sup>36</sup> 2008 The French White Paper on Defense and National Security, at <http://www.defense.gouv.fr/content/download/134828/1175142/version/1/file/LivreBlancGB.pdf>, p. 162.

<sup>37</sup> Alliot-Marie, 2006.

<sup>38</sup> Bentégeat, Sénat, 2006, p. 29.

<sup>39</sup> *Ibid.*

<sup>40</sup> Laurent Zecchini, *Le Monde*, 2 March 2006.

<sup>41</sup> Alliot-Marie, 2006.

<sup>42</sup> Chirac, 2006.

<sup>43</sup> Capitaine de Frégate Guillaume Martin de Clausonne (now in charge of the Barraduca project at the Commandement of the Marine Corps), “Ouvrons le débat sur la dissuasion nucléaire, La Tribune du Collège Interarmées de défense,” October 2006. Gali Dejean, 2006, at <http://www.assemblee-nationale.fr/12/cr-cdef/05-06/c0506021.asp#TopOfPage>.

<sup>44</sup> Michel Rocard, a son of Yves Rocard, one of the very few scientists in favor of a French nuclear weapon from the very beginning. Report of the Canberra Commission on the abolition of nuclear weapons, preface to the French edition, Editions Odile Jacob, 1997.

<sup>45</sup> Pour un désarmement nucléaire mondial, seule réponse à la prolifération anarchique, Alain Juppé, Bernard Norlain, Alain Richard, Michel Rocard, *Le Monde*, 14.10.09.

<sup>46</sup> Alain Juppé et Michel Rocard en faveur d’un désarmement nucléaire mondial, y compris pour la France, Jean Guisnel, *Le Point*, 14 Octobre 2009.

<sup>47</sup> 22/10/08: 50e anniversaire de la direction des applications militaires du commissariat à l’énergie atomique, le général d’armée Jean-Louis Georgelin, chef d’Etat-major des armées, at [http://www.defense.gouv.fr/ema/commandement/le\\_chef\\_d\\_etat\\_major/interventions/discours/22\\_10\\_08\\_50e\\_anniversaire\\_de\\_la\\_direction\\_des\\_applications\\_militaires\\_du\\_commissariat\\_a\\_l\\_e\\_nergie\\_atomique](http://www.defense.gouv.fr/ema/commandement/le_chef_d_etat_major/interventions/discours/22_10_08_50e_anniversaire_de_la_direction_des_applications_militaires_du_commissariat_a_l_e_nergie_atomique).

<sup>48</sup> Cherbourg, 2008.

<sup>49</sup> Louis Gautier, conseiller à la Cour des comptes, ancien conseiller Défense du Premier ministre, *L'avenir de la dissuasion française*, Intervention prononcée lors du colloque L'avenir de la dissuasion française du 10 juillet 2006, at [http://www.fondation-res-publica.org/L-avenir-de-la-dissuasion-francaise\\_r27.html](http://www.fondation-res-publica.org/L-avenir-de-la-dissuasion-francaise_r27.html).

<sup>50</sup> Xavier Pintat in Examen des crédits nucléaire, espace et services communs, Projet de loi de finances: examen des crédits “nucléaire, espace et services communs,” 24 novembre 2004, at <http://www.senat.fr/commission/etr/etrg041129.html>.

<sup>51</sup> Alliot-Marie, quoted in *Le Figaro*, La France Modernise Sa Dissuasion Nucleaire, Isabelle Lasserre 14 janvier 2005.

<sup>52</sup> La propulsion nucléaire, un savoir-faire indispensable à la souveraineté nationale, Michel Picard, avec la collaboration de Bruno Tertrais, Fondation pour la Recherche Stratégique, 30 juin 2006, p. 12, at [http://www.frstrategie.org/barreFRS/publications/rd/RD\\_20060630.pdf](http://www.frstrategie.org/barreFRS/publications/rd/RD_20060630.pdf). In the hypothetical situation of an increase in the number of permanent members of the UN Security Council, maintaining a nuclear force would allow France to preserve its greater weight relative to the non-nuclear newcomers (for example Germany or Japan), p. 13.

<sup>53</sup> *Ibid.*, p. 12.

<sup>54</sup> Capitaine de Frégate Guillaume Martin de Clausonne, Ouvrons le débat sur la dissuasion nucléaire, La Tribune du Collège Interarmées de défense. October 2006.

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<sup>55</sup> Intervention prononcée par Eric Danon, chef de la délégation française, 6 Mai 2009, NPT Prepcom.

<sup>56</sup> Francis Gutmann, Nécessité de la dissuasion, DéfenseIHEDN, n°140 Juillet-Août 2009.

<sup>57</sup> François de Rose and Olivier Debouzy, “Eliminer les armes nucléaires?” in *Commentaires*, N° 126, Été 2009.

<sup>58</sup> Michel Rocard, Oui à un second porte-avions financé par le nucléaire, *Le Figaro*, 12/06/2008.

<sup>59</sup> Dominique David, “Non, Monsieur Rocard, le porte-avions n’est pas la France,” *Le Figaro*, 19 June 2008.

<sup>60</sup> Laurent Zecchini, Revisiter la dissuasion nucléaire, *Le Monde*, 27/10/2004.

<sup>61</sup> La dissuasion nucléaire: quel rôle dans la défense française aujourd’hui?, Sénat, Rapport d’information n° 36 (2006–2007) de M. Serge VINÇON, fait au nom de la commission des affaires étrangères, déposé le 24 octobre 2006, at [http://www.senat.fr/rap/r06-036/r06-036\\_mono.html](http://www.senat.fr/rap/r06-036/r06-036_mono.html) avant propos.

<sup>62</sup> Paul Quilès, “France Inter,” quoted in “The reactions to the speech by Jacques Chirac on the eventual cases of nuclear response,” Nouvelobs.com, January 20, 2006. A former Defense Minister “regrets that the debate never materialized on this issue [of the deterrence adapted to present circumstances] not in the Parliament, nor in any other place.”

<sup>63</sup> Dissuasion, Henri Bentégeat, in *Défense nationale et sécurité collective*, n°8-9, août-septembre 2004, p. 11.

<sup>64</sup> Heisbourg quoting Laurent Zecchini, Revisiter la dissuasion nucléaire, *Le Monde*, 27/10/2004.

<sup>65</sup> Cahal Milmo, “So, Admiral, what have you got to say about the nuclear submarine crash?” *The Independent*, 17 February 2009.

<sup>66</sup> Laurent Zecchini, Revisiter la dissuasion nucléaire, *Le Monde*, 27/10/2004.

<sup>67</sup> Martin de Clausonne, 2006.

<sup>68</sup> 4th United Nations General Assembly, United Nations Security Council Summit on Nuclear Non-Proliferation and nuclear disarmament– Speech by Nicolas Sarkozy, President of the Republic, to the United Nations Security Council, New York, 24 September 2009.

<sup>69</sup> Martin de Clausonne, 2006.

<sup>70</sup> *Ibid.*

<sup>71</sup> Toon and Robock’s research is available at their website,  
<http://climate.envsci.rutgers.edu/nuclear/>.

<sup>72</sup> Venance Journé, “Towards disarmament: What role for Middle Nuclear Powers?” August 2008, World Scientific Publishing Co. Pte. Ltd., Singapore, The Science and Culture Series, International Seminars on Nuclear War and Planetary Emergencies, 40th Session.

<sup>73</sup> UK-Norway initiative presentation, at

[http://www.armscontrolverification.org/2009\\_05\\_01\\_archive.html](http://www.armscontrolverification.org/2009_05_01_archive.html).