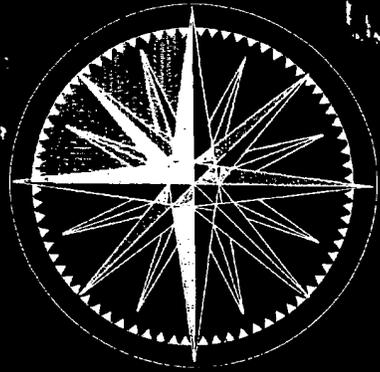


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SPECIAL REPORT

OFFICE OF CURRENT INTELLIGENCE

THE FRENCH NUCLEAR STRIKE FORCE PROGRAM

CENTRAL INTELLIGENCE AGENCY

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31 May 1963

THE FRENCH NUCLEAR STRIKE FORCE PROGRAM*

Unshaken by increasing costs, delays, and the prospect of early obsolescence of the Mirage IV delivery system, France is pressing ahead with the development of a nuclear "force de frappe." The over-all cost of developing this strike force is high, but probably not too great for the French economy if present growth is maintained and inflationary pressures are limited. To minimize cost and meet the current timetable for the various strike force elements, however, hard decisions must still be made on what systems and what degree of sophistication to shoot for.

The Goals

French efforts to achieve a nuclear strike force now appear firmly centered on the Mirage IV bomber with 50- to 60-kiloton fission weapons as a first-generation system, and on a force of nuclear submarines carrying intermediate-range ballistic missiles (IRBMs) with thermonuclear warheads as a second-generation system. An article by Armed Forces Minister Messmer in the May issue of Revue de la Defense Nationale gave at least semiofficial notice that this is the path the French are following. His statement implied that other possible delivery systems, such

as land-based IRBMs or air-to-surface missiles, will not be pressed to the point of developing an operational capability, even though they could be achieved earlier and at less cost than the submarine-based system.

In short, the French appear to have decided to concentrate for reasons of cost and effectiveness on certain aspects of their program but have not finally eliminated other potentially promising projects. Competition for the available resources has not yet reached the stage where final decisions are necessary.

Mirage IV Aircraft

The Mirage IV aircraft, despite its inadequate radius of operation and other shortcomings, will remain France's only means of delivering nuclear weapons for the next five years and possibly for an additional one to two years. Because of this, and because resources have already been expanded to meet aircraft

* This article has been prepared in collaboration with the Offices of National Estimates, Scientific Intelligence, and Research and Reports. A Special National Intelligence Estimate on the French nuclear program is scheduled for preparation in June.

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ESTIMATED CUMULATIVE COSTS OF FRENCH WEAPONS SYSTEMS
(BILLION DOLLARS)

	1946	1955	1956	1959	1961	1962	1965	1966	1969	1972
NUCLEAR PROGRAM					2.5		5.5- 6.5	6.5-13		10-18
MIRAGE IV BOMBER AIRCRAFT					0.1		0.2- 0.25			
AIR-TO-SURFACE MISSILE							0.1- 0.2			
INTERMEDIATE-RANGE BALLISTIC MISSILE								0.65-0.85		
MISSILE-LAUNCHING SUBMARINE										1.5-2

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development and production-line tooling costs, it is highly likely that production of the Mirage IV will be maintained at the planned rate.

However, since maintenance of the Mirage IV force on an airborne alert would greatly increase operating expenses, Paris may choose to maintain it at such a state of readiness only in times of severe crisis.

There is some evidence that in order to increase the Mirage IV's combat range and survivability, the French have considered development of air-to-surface missiles. Reduction

of bomb size and weight would also make some pod volume available for fuel. However, neither of these schemes will yield sufficient benefit to justify the

Messmer stated in his article that France's military expenditures are absorbing 7.4 percent of its gross national product (GNP), calculated in terms of the cost of the various factors of production (5.5 percent if calculated at current market prices). These expenditures, he said, are to be held to a constant share of GNP although they will increase in absolute terms by some one billion francs a year until 1970.

Messmer said also that expenditures for the nuclear strike force currently amounted to less than 13 percent of the military budget and would not exceed 25 percent by 1970. He noted that the military budget for 1963 is 18.5 billion francs (\$3.8 billion) -- or, on a basis for international comparison, 20.5 billion francs (\$4.2 billion).

Calculations based on US military program concepts, however, suggest that France's "force de frappe" is more burdensome than indicated by Messmer--perhaps even twice as costly. (~~SECRET NO FOREIGN DISSEM~~)

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necessary effort. Within the limitations of the existing Mirage IV design, in-flight refueling is the most practical method of range extension. At best, the Mirage IV weapons system falls short of French requirements.

Submarine Program

The development of a submarine-launched IRBM is closely related to that of the "Diamant" satellite booster--the first two stages of which presumably could also serve as a land-based missile--and even that of the earlier sounding rockets used in the French space program. At this particular stage of French missilery, benefits for both the military and space programs can be derived from further development of the "Diamant's" liquid-fueled first stage.

As the various programs continue to develop, however, they will become less interwoven and could result in heightened direct competition for available resources and technicians. Pressures for decisions to cut back the programs less directly beneficial to the submarine missile project will mount. However, the collateral technical benefits for French science and industry of the missile and space programs in general--which the government has publicly emphasized--would probably militate

against dropping completely those programs not directly related to the Polaris-type submarine system.

In any case, curtailing a land-based IRBM program would not result in substantial over-all savings in the short run since most of the initial cost would be in research and development. At the same time if Paris hopes to have its submarine system on schedule, it must not slight development of those technical items, such as the complex navigational system, peculiar to the nuclear submarine. Perfection of some of these items could cause further difficulties and delays.

Nuclear Weapons

The development of nuclear warheads and higher yield bombs is far and away the most expensive aspect of the French strike force program, and the conquest of the technical problems involved is the controlling factor in the acquisition of a complete, second-generation system. As in the case of missile development, the road along which the French nuclear program must travel is well defined. Where on the road France may wish to stop or, at least, pause, is less certain.

There is every indication that France will press ahead with the development of a 1,500-

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pound submegaton thermonuclear warhead that would be compatible with the submarine-launched missiles. Such a weapon probably could not be achieved until the early 1970s, assuming that there is no decrease in testing and developmental efforts.

Although resources available to the nuclear program could be concentrated on the development of a thermonuclear weapon to the detriment of peaceful uses for energy and fission weapons, much of the expenditure in the latter two fields has already been made, and little would be saved by such a move. The plutonium production facility at Marcoule is in operation. At least seven tests of plutonium weapons have been completed, and achievement of a 1,500-pound, 100-KT weapon is probably within reach by about 1967.

Furthermore, the development of a fission warhead of this size would be compatible

with the anticipated submarine-launched IRBM and would serve as an interim warhead until a thermonuclear warhead of appropriate weight and dimensions could be developed. A warhead of this yield probably would satisfy French requirements for a weapon to be used against population centers.

Competition for Resources

The various elements of the French nuclear weapons system program have not yet been unacceptably competitive in terms of available resources and manpower. Moreover, because both missile and nuclear weapon development stages are sequential in character, resources can for some time be spread among several projects without jeopardizing progress toward the attainment of the principal objectives. However, hard decisions remain to be made on what degree of sophistication and power is acceptable for each weapons system. ~~(SECRET NO FOREIGN DISSEM)~~

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