

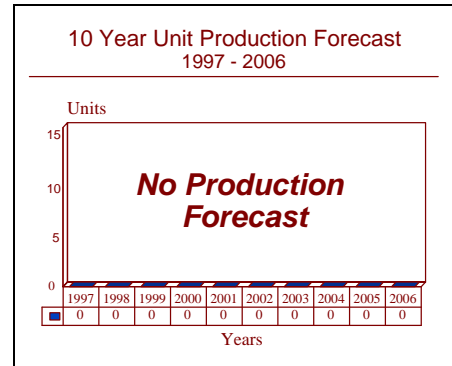
ARCHIVED REPORT

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Hades - Archived 1/98

Outlook

- Program concluded prior to procurement objective being reached.
- All Hades missiles produced have been placed in storage.
- Plans to dismantle these missiles and destroy their warheads were postponed, but now may move ahead.



Orientation

Description. Land mobile tactical nuclear missile.

Sponsor. The French Ministry of Defense through the Direction Technique des Engins for the French Army.

Contractors. Developed and produced by Aerospatiale, Division des Systemes Balistiques et Spatiaux; Les Mureaux, France.

Status. Production halted, although the French Government did decide to complete almost 20 missiles. Plans to dismantle the missiles and destroy their warheads have been postponed. The missiles will be placed in storage so that they can be reactivated if France were to become involved in a prolonged military crisis in Europe. The Hades was to be declared operational on September 1, 1991. The deployment structure within the French army for such mobile missiles was to have been drastically reduced from the present five (Pluton) regiments to only two (Hades). The Hades missile was to have been attached to the 15th Artillery Regiment (to be the first equipped with Hades and stationed in Suippes) and the 3rd Artillery Regiment (to be stationed at Mailly-le-camp). Retirement of the first Pluton missiles took place in 1993 and continued through 1995.

Aerospatiale successfully completed its first flight test of the Hades tactical mobile nuclear missile in 1988. The

test was conducted at the Landes firing range in southwest France, on November 2nd. The second successful test flight was on March 8, 1989. The third flight test was also successful.

Total Produced. Production of the Hades was to have included a total of 15 launchers and 30 missiles. Production was to have been halted (in June 1992) before all these systems were completed. However, the 1992 cancellation was later altered when the French government told Aerospatiale to complete all but a few of the weapons it had in production. Approximately 35 missiles are believed to have been manufactured over the life of this program. Initial low-rate production commenced in 1991.

Application. Surface-to-surface tactical nuclear missile for use against hostile troops, armored formations and other area/hard targets in the Forward Edge of Battle Area (FEBA) and for rear area interdictions. Alternative warheads may be used for different missions. The Hades was to replace France's current inventory of Pluton nuclear missiles.

Price Range. Research indicates a unit cost of around \$29,500,000 in Fiscal 1994 dollars.

Technical Data

Design Features. Little is known about the Hades except that it is a land mobile missile somewhat similar in dimensions to Pluton. The ballistic missile's range was said to have been enhanced from the original figure of 450 kilometers (242.98 nm), which was up from a prior rating of around 350 kilometers (188.99 nm), to 500 kilometers (269.98 nm).

Propulsion. The Hades uses a solid fuel rocket motor propulsion system developed by SEP and SNPE of France.

Control & Guidance. The missile is equipped with an Dassault Electronique and SAGEM designed inertial guidance system. This advanced simplified inertial reference system provides a circle of equal probability approximately 150-200 meters at full range.

Launcher Mode. The Hades is vertically launched from a canister mounted on a wheeled semi-trailer. There are two missiles deployed on each launch vehicle. Each launch vehicle is towed by a wheeled tractor. The carrier vehicle for Hades could be common with that planned for the S4 (see Sol-Sol Balistique Strategique report), a tactical wheeled transport.

Warhead. A nuclear warhead designated TN 90, most likely a boosted fission type with a variable yield of up to 80 kilotons, is fitted; an enhanced radiation warhead for this missile is fairly certain. The warhead was developed by the Commissariat a l'Energie Atomique (Atomic Energy Commission). However, the missile is capable of carrying other types of warheads, although the kilotonnages have not been specified.

Variants/Upgrades

No specific additional variants of Hades will be produced, although prior to the halting of production some upgrades were being considered, notably longer range. The extension of Hades' range put the system within the limits of the Intermediate Range Nuclear Forces Treaty between the United States and the former Soviet Union, but

enabled French nuclear arms to cover German territory while deployed in-country. French Defense Minister Andre Giraud had previously said that the missile would have a greater range capacity than expected. The Hades was expected to be capable of striking targets at ranges up to 500 kilometers.

Program Review

Background. In the late seventies, France began to study a successor to the Pluton tactical nuclear missile system. The French army studied several options, including an air breathing cruise missile-type system, but eventually decided on a ballistic missile similar to the Pluton. For further details on the Pluton, we refer the reader to the separate report in this section.

Initially, Aerospatiale, which developed and produced Pluton, was in competition with Engins Matra for the Hades program. In August 1983, the Aerospatiale design was chosen and initial funding authorized a short time later. The 1983 French Defense Budget put the total development cost of Hades at between 7 and 10 billion francs (about \$909 million to \$1.298 billion dollars at 7.7 francs to the dollar).

Support and Criticism. French Defense Minister Andre Giraud emphasized in a speech on July 25, 1987, the important role played by the CEL in developing France's strategic weapon systems. He said that testing of the Hades tactical surface-to-surface nuclear missile would begin in 1988. There has been some doubt among the French

military concerning the suitability of the Hades missile for launching a neutron warhead.

Former Deputy Director of France's Pacific nuclear test center, General Guy Lewin, said that although the smaller neutron warhead carried by the Hades missile could be fired at a distance greater than the ASMP (350 km compared to 300), the immediate effects of such weapons on tank divisions would be limited to within 1,200 or 1,500 meters, and that large numbers of them (probably several hundred) would need to be deployed to achieve the desired results.

Despite these misgivings, the French Defense Minister confirmed the continuation of the Hades program, which, according to him, was progressing satisfactorily. In the light of the recent Intermediate Range Nuclear Forces Treaty between the US and the Soviet Union, France appeared unlikely to abandon this program. Hades was expected to be ready for operational service by 1992.

Hades System Description. The Hades missile is generally similar to Pluton in dimensions but is possibly a little

shorter. Other than the facts noted in the Technical Data section, no other details of the missile are known. The launcher is probably a wheeled tractor/trailer system as opposed to the tracked system used for Pluton. It is also fairly certain that each vertical launcher has two missiles placed side by side. Operational capability was planned for 1992.

New Communication System. Thomson-CSF has been awarded a research and development contract for an advanced version of the existing RITA radio communications system for use between the French Government and Hades-equipped regiments. The RITA system will use more modern technology and will be resistant to electronic countermeasures.

Funding

France's yearly allocations for the development of the Hades missile are not readily available, although the program is believed to have cost some FFr10-11 billion (\$1.8-2 billion). The Hades procurement program was expected to cost the French government some FFr13.5 billion (\$5.4 billion), down from a previous total of FFr17.5 billion (\$7 billion). The French government had revised its procurement objective for Hades down to 15 launchers and 30 missiles, prior to halting production. Previously, these numbers have ranged from 180 missiles (on 90 launch vehicles) to 120, to 80 and down to 40. Previously, the French military was to have received 20 launchers.

The Hades was to have replaced the Pluton, but not on a one-for-one basis and not in the field. The five Pluton missile regiments were to be replaced with two Hades regiments, the first being the 15th Artillery Regiment, grouped in a single division as part of the French 1st army. The second unit was to be the 3rd Artillery Regiment. The previously expected third Hades regiment will not be deployed. However, the Hades missiles will be put in storage and will not be delivered to either the 15th or 3rd Artillery Regiments.

Recent Contracts

No contract information has been released by the French government or the prime contractor, although production is known to be underway.

Timetable

Late	1970s	Concept development
Aug	1983	Aerospatiale won Hades contract
	1986	Development continued
Late	1988	First flight test
	1989	Second and third test flight
	1990-91	Final flight tests completed
	1991	Procurement total reduced
Jun	1992	Production halt announced
Late	1992	Aerospatiale told to complete work on existing missiles
	1993-94 ^(a)	Production completed

^(a) estimated

Worldwide Distribution

Distribution of this system is limited to the French armed forces as export is illegal under the present French law.

User Country(s). **France** will be the exclusive operator of the Hades missile systems.

Forecast Rationale

No further production of Hades will take place. Those missiles completed by Aerospatiale are in storage and remain available for redeployment if the need arises. The reactivating of Hades would require a significant military crisis, such as a wider Balkans War or the spread of civil conflict throughout North Africa. But the French may

decide to move ahead with long-standing plans to dismantle these missiles, thereby ending any chance of Hades being reactivated. In the future, France will depend on long-range sea-based and airborne weapons to provide its nuclear deterrent.

Ten-Year Outlook

ESTIMATED CALENDAR YEAR PRODUCTION

Missile	(Engine)	<u>High Confidence Level</u>										<u>Good Confidence Level</u>		<u>Speculative</u>		Total 97-06	
		thru 96	97	98	99	00	01	02	03	04	05	06					
AEROSPATIALE																	
HADES(a)	UNSPECIFIED	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Production		35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

(a) 1987 and 1988 production figures include RDT&E prototypes. In 1990 there was a design freeze. Production for 1991 includes operational test missiles, as well as the first initial production units.