

F21

The new heavyweight torpedo of the French navy

HEAVYWEIGHT TORPEDO

Mission

Designed to neutralize the surface vessels and submarines, the heavyweight torpedo F21, based on the Black Shark design, will equip all the French submarines to replace the current torpedo F17 mod2.

The contract (Artémis program) awarded to DCNS by the Délégation Générale pour l'Armement (DGA) carries on the following points:

- Complement of development of the torpedoes weapon system
- Production of hundred of torpedoes F21
- Development of new trial means
- Operational maintenance of torpedoes for 6 years



HIGH SPEED AND PERFORMANCE

OPTIMISED TO OPERATE IN DEEP AND SHALLOW WATER

COMPLIANT WITH THE WORLD'S MOST STRINGENT SAFETY REQUIREMENTS

DEPLOYABLE IN SWIM OUT OR BY PNEUMATIC RAM

HIGH ANTI COUNTER-MEASURE CAPABILITY

STRENGTH at sea

DCNS

KEY POINTS

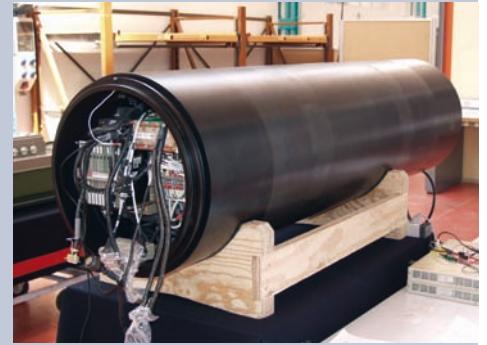
The most effective heavyweight torpedo

The new F21 is the most modern and most effective heavy weight torpedo of the market. With a very high speed, its several modes of working (active, passive and wake homing) and its capacity in very shallow water, the F21 is the reference of the new heavy weight torpedoes generation.

The F21 answers the specificities of the requirements of the French Navy, the

capacity of launching by pneumatic rammer, an extended operating mode, the respect of the safety norms of the nuclear submarines and its functional integration with the various combat systems. As prime contractor, design authority and lead system integrator, DCNS will take overall responsibility for the Artémis program.

PB50: Primary battery AgO/AI ▶



Energy module

The heavy weight torpedo F21 is equipped with the energy module PB50. This primary battery is based on the technology aluminium-silver oxide (AgOAI) developed by DCNS and already used for the lightweight torpedo MU90. DCNS is the only company able to master this very powerful energy supply. The mass efficiency, more of twice upper to primary battery silver zinc, increases appreciably the maximal speed in a total safety and without impact on the marine

environment. Furthermore, the exercise version of the F21 will take advantage of the current development by DCNS of the technology lithiumion. Our customer will have the benefit of a lower cost of the sea trials with representative performances of a torpedo in combat version.

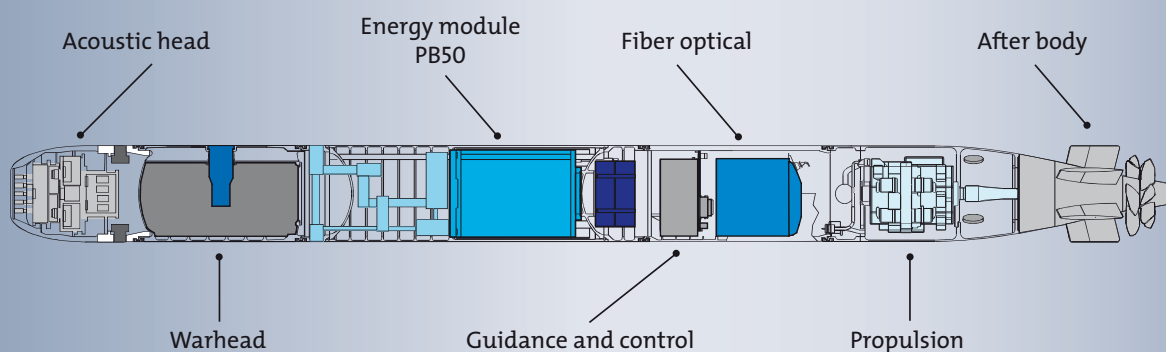
Insensitive warhead

Due to the very high level of safety requirement of the French Navy, for the integration of weapons onboard the SSN and SSBN, DCNS has developed a new warhead respecting the standard MURAT. The explosive B2211, totally insensitive ammunition, is coupled with a stake of electronic fire which allows the loading into the torpedo in combat version. The weapon, loaded ready to use, requires no human intervention on the warhead during the storage onboard and in the tube.

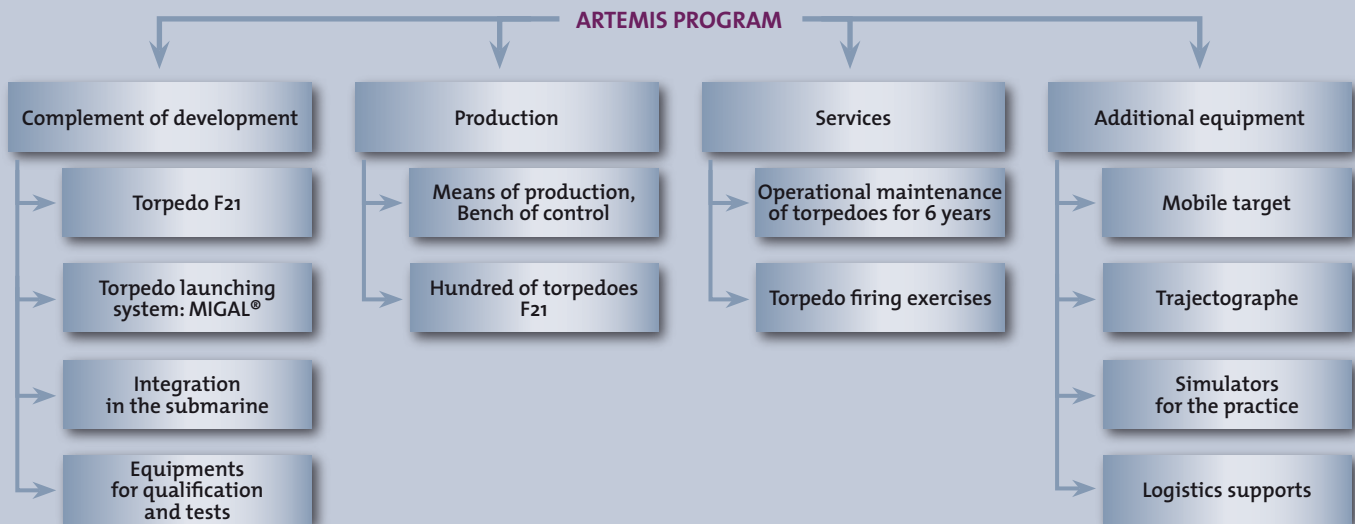


◀ Black Shark boarding into the Scorpene® SSK «O'Higgins»

F21 - MAIN ITEMS



KEY POINTS



▲ Torpedo interface system: MIGAL®

Torpedo launching system MIGAL®

The interface between the weapon and the launcher, the MIGAL® system, will be integrated on all the SSN and SSBN. This product allows the deployment and the wire-guidance of several torpedoes at the same time.

DCNS reinforces its positioning of designer and integrator of underwater weapons. The Artémis program contains all the equipments from the CMS interface to the weapon for a total control of the performances of the torpedo.

Up to date test equipments

The Artémis program comes along with a global restructuring of all the means of tests dedicated to the torpedo activity.

Indeed, the contract plans the development of new systems of numeric and hybrid simulation to qualify the torpedo, to test the set of the performances of the weapon and to achieve various operational simulators dedicated to the training and the practice of the crews.



▲ Mobile target Ch1 mod 3

DCNS will also develop the mobile target Ch1 mod 3, which is an UUV of 6 m of length intended to simulate the presence of a submarine and to perform firings of torpedo qualification. The vehicle tows a set of transducers which simulate the acoustic envelope of a submarine to attract the attacking torpedo.

A global contract

The Artémis program comes along with numerous services.

The contract plans for 6 years the total maintenance of the torpedoes with a very ambitious objective of availability. This part of the contract develops the sector of services at DCNS by optimizing the maintenance cost's of the product for the customer.

Furthermore, DCNS supplies complete firing exercise for the training of the

crews. The perimeter includes the preparation of the torpedoes, the deployment of the mobile target Ch1 mod 3, the recuperation of all the equipments and the analysis of firings from the tape recorders arranged in the contraptions and on the exercise field. This service allows the customer to focus on the operational side of the exercises.





➔ A world leader

This new large-scale project consolidates the group DCNS in its position of world leader of underwater weapons. The Artémis program will ensure the growth of the DCNS's torpedo activity for the next decade. After the success of the lightweight torpedo MU90, DCNS opens up of new major perspectives in the heavyweight torpedo's market segment.



DCNS

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