

The French Land Force Defence Industry



Nexter

Confronted with today's geo-strategic developments and the ensuing ever-complex multi-dimensional threats, modern land forces must be able to quickly adapt to a broad spectrum of situations and provide an appropriate range of reactions, from crowd control in peacekeeping operations to coercive or targeted strikes during asymmetric or high-intensity conflicts.

The very latest examples of armed conflicts in Iraq, Afghanistan or Lebanon have emphasised the necessity of strengthening the protection, tactical and strategic mobility, and firepower of land forces. Network-centric operations or network centric warfare is also a key component in the transformation of the land forces.

France has a cutting-edge, world-class Land Defence Industry, which works on avant-garde projects, notwithstanding the prevailing limited defence budgets. This is exemplified by the Scorpion programme and other innovations in the fields of intelligence, unmanned aerial vehicles, force protection, asymmetric warfare and communications.

The industry also has a fast-developing array of land equipment that encompasses all fields. Since the last Eurosatory exhibition, which took place in 2008, a number of new products have been delivered to the French Army or will be delivered very soon. These include VBCIs (Armoured Infantry Combat Vehicles), PVPs (light armoured vehicles), the FELIN future soldier systems, the Caesar artillery system, software-radios and other ancillary equipment such as noise cancelling headphones for tank or armoured vehicle crew.

Export-oriented French Defence Industry:

With some €8 billion worth of items exported in 2009, France's Land Defence Industry plays a significant part in total French exports. Its main export areas are: the EU (export and cooperation) and faraway export destinations, especially the Middle East but also the Americas and the Asia-Pacific.

The current impetus comes within the scope of the government's new approach, with a number of efforts initiated during the summer of 2007 by the Ministry of Defence and aimed at furthering armament exports. Carried out in close cooperation with defence companies, these efforts resulted in the launch of a "strategy for giving new impetus to defence exports" in December 2007, based on a report drawn up by member of parliament Yves Fromion (in June 2007).

A Manifold, Complementary and Global Industry: France's Land Defence Industry includes not only the big world-class companies but also a network of innovative small and medium scale enterprises (SMEs). With this two-fold coverage, the industry is able to put forward both complex offers (such as systems of systems) and off-the-shelf equipment, while at the same time developing projects stretched over many years or meeting urgent operational requirements.

This complementary nature and close links between the SMEs and big companies provide the French Land Defence Industry with unique flexibility and adaptability. Eventually, the French offer includes follow-ups to export sales that consist of a technical operation support package (advice and training, lessons-learned, through-life support services) throughout the equipment life. The industry has traditionally always been very

open to cooperation partnerships and technology transfers. This pragmatic approach enables it to reach out to many markets, while also generating reciprocal trust.

Renewed French Offer in the Air-land Sector

Building on the operational experience of the French Armed Forces, France's industry produces an ever-renewed range of land equipment, covering all fields: infantry, helicopters, artillery, engineering and related equipment. These items, initially designed to meet the French Army's requirements and adapt to new threats, are also offered by France to the armed forces of friendly countries willing to acquire them.

In the field of infantry, VBCIs developed by Nexter Systems as the prime contractor and Renault Trucks Defense as a subcontractor, provide dismounted soldiers with enhanced protection mobility and fire support, including in urban environments. The French Army is to receive 630 items from 2008 to 2014. Other armed forces are also interested in VBCIs, especially Canada.

The French infantry also will take delivery of all the 22,588 FELIN future soldiers systems in 2014. The FELIN clothing and equipment ensemble, which is available for export, is a cutting-edge modular and integrated system that enables it to optimise and multiply fighters' capabilities in terms of protection, mobility, communications, lethality, observation and sustainability. Its designer, Sagem Défense Sécurité, has also been selected by Switzerland as the main subcontractor for the Swiss future soldier system, whose prime contractor is EADS.

The FELIN system is fully compatible with VB-CIs and PVPs. The PVP vehicle is manufactured by Panhard and is especially designed for tactical communication. PVPs have started to replace the army's light un-armoured vehicles since 2008. The army is to receive 933 PVPs. After several successful operational deployments this equipment has acquired a combat proven status. The PVP is also available for export, for security and military forces of countries such as Germany.

The brand new range of Sherpa vehicles developed by Renault Trucks Defense is also available for export. The Sherpa range includes tactical trucks, vehicles and a light 4x4 armoured vehicle (Sherpa Light). NATO and France are its first buyers, with tactical trucks and Caesar self-propelled gun chassis. The ARAVIS, developed by Nexter Systems will provide French troops in Afghanistan with a very high level of protection which will allow them to fulfil "reconnaissance area" missions in safety. This multipurpose vehicle (combat patrol, reconnaissance zone, convoy protection etc) offers the best of proven mobility solution and the operational advantages of versatility by design.

In the field of helicopters, Eurocopter completely renewed the French offer, with its Tiger for combat and close air support missions, its NH-90 for tactical transport and the EC725 Caracal for special missions (combat search and rescue, special forces etc). These aircraft have become vital to today's armed forces and are very much in demand for operations such as the deployment of EC725 Caracals in Afghanistan, and for export (14 countries have ordered NH-90s, four countries have ordered Tigers, two countries have ordered the EC725s).

The very first French Tiger Army Regiment was set up in 2007. The army has already taken delivery of 14 EC725 Caracals while the first mass-produced French NH-90s should be delivered in 2011.

In the field of artillery, the French industry stands among the first industries that propose products as innovative as Nexter's Caesar artillery system or Thales/TDA Armements' 2R2M vehicle-mounted

The first phase that is to end in 2020 includes deliveries of:

- almost a thousand VBMR multirole armoured vehicles;
- about 70 EBRC reconnaissance and combat light tanks; and
- the whole Leclerc tank fleet upgraded at standard 1 (that is 254 vehicles under the French White Paper on Defence).



On top of the fields of infantry, helicopters and artillery, the new French range of weapons also covers a number of equipment adaptable to all kinds of French or foreign platforms. They include precision munitions, command and information systems, telecommunications, intelligence multi-sensor systems, optronics, positioning and tracking systems, counter-IED, UAVs and land robots, engineer equipment, sniper spotting systems and self-protection systems.

Command and Control

As an example, the main French manufacturers such as Thales, EADS, Sagem Défense Sécurité (a SAFRAN subsidiary) are all involved in the digitisation of French land forces which results in the implementation of command and information systems dedicated to the whole spectrum of operative levels (forces, regiments, units). Separately, VBCIs, PVPs and FELIN future soldier systems are all equipped with inter-operable command and information systems, passing of orders, friendly/foe tactical situation exchange, and supported



Photos: Eurocopter

by logistics follow-up. Such systems improve communications and better coordinate the action of all players on the battlefield. They have already been successfully tested by the French Army in Côte d'Ivoire and will soon be tested in Afghanistan on other platforms such as VAB and VBL light armoured vehicles. Moreover, with the know-how of the French industry in command and information systems, the French forces now have multinational command centres that allow France to be granted the status of framework nation in overseas operations, both in the scope of the EU and NATO. These command and information technologies are deployed in the army, at the levels of the Lille-based Rapid Reaction Corps Command (RCC-Fr) in Lille or Force headquarters (FHQ).

Defence Technological and Industrial Base

To meet today's and tomorrow's requirements, the equipment of land forces hinges upon a stable and robust Defence Technological and Industrial Base (DTIB), capable of quickly satisfying the needs of the armed forces who are fully associated with research and development (R&D) efforts. The aim is to achieve operational superiority.

Today, the land defence industry is made of a well-balanced network of big, medium and small companies (out of the 198 companies, members of the Professional Association of French Land Defence Companies (GICAT), 80% are SMEs) and offers a full range of skills and products that cover the whole spectrum of the land forces operations. France's Land Defence Industry enjoys cutting-edge technological skills that compare with those of the United States in various fields such as secure signals or night fighting. As it encompasses both world-class companies and innovating SMEs, the French land DTIB also has an industry that is able to draw up complex offers while also acting as a SoSI (System of Systems Integrator) architect, producing dual off-the-shelf equipment, developing projects on the long-run and meet urgent operational requirements (UORs).

French companies from the land and air-land industry currently have a turnover of €4 billion with some 16,000 employees. They act as equipment manufacturers or prime contractors, in five main sectors:

- Vehicle and armoured vehicle sector, where they develop and manufacture very-close range armoured systems, tactical and logistical communication vehicles, and mobility enhancement and engineering systems.
- The electronics and systems sector: architecture of command, intelligence and communications systems, electronic components of weapon systems.

- The sector of weapons and ammunition: artillery systems, traditional and precision munitions, also reporting significant developments.
- The air-land sector: missile systems, UAVs and helicopters.
- The sector of services: training support systems (ie simulation) and logistics capabilities.

Defence Industry Cooperation

France's defence industry has always traditionally been open to cooperation, partnerships and technology transfers. At the European level, it is involved in the ASD (AeroSpace Defence Association) industrial structures with an active participation in the ELDIG (European industry Group). It is also a participant of cooperative studies managed by the EDA (European Defence Agency) like the "Force Protection" project.

Moreover, the land sector industry contributes a significant part to defence exports, with a turnover of almost €1.5 billion, which represents a significant part of the French defence exports. It is involved in European cooperation, with programmes such as Tiger and NH90 and also features among the top contractors for prospective customers in the fields of C⁴I systems and armoured vehicles. Finally, its GICAT working groups, and also its support to SMEs are well in line with the government's new approach on European DTIB and with the boosting of exports.

It also works in synergy with the Army and Defence Procurement Agency (DGA), which enables it to deliver weapon systems tailored to today's ever-changing threats and capable of producing tactical deterrence in the current crises, with emphasis put on:

- Tactical manoeuvres, for instance with the VBCI developed by Nexter and Renault Trucks (subcontractor), the ARAVIS Vehicle developed by Nexter and with Panhard's light armoured vehicles (PVPs);



Sagem Défense Sécurité FELIN

- Field and population control with the FELIN future soldier system developed by Sagem Défense Sécurité;
- Long-range responsive precision strike with Nexter's Caesar systems.

France's land sector industry is always seeking technological break-throughs, which makes it a top-ranking contractor for the land forces core-capabilities especially with:

- Close range reconnaissance systems, with DRAC UAVs manufacture by EADS DS, and Bertin technical solutions for urban environments;
- Battlefield digitisation thanks to broadband secure networks (Thales software radio and EADS BLRIP);
- Active protection of forces (counter IED) and armoured vehicles against anti-tank threats.

In the field of ammunition, the armed forces have new expectations especially when it comes to reducing the vulnerability of combat platforms (Insensitive Munitions—IMs) or in the operating and owning costs. These expectations are met by the MURAT insensitive composite explosive charge developed and manufactured by EURENCO (a subsidiary of SNPE Group). MURAT insensitive charges guarantee the full security of personnel, while also providing weapon systems with high-performance capability. EURENCO also takes part in many transnational programmes in partnership with a number of ammunition manufacturers and governmental organisations, aimed at developing energy products tailored to their needs: modular artillery charges, propulsive charges and gun-powder for big calibre munitions, explosives and chemical compounds, new energy molecules, and reactive armour.

Eventually, this world-class land defence industry is mindful of remaining innovative and works on cutting-edge projects despite limited budgets. France has a cutting-edge, world-class Land Defence Industry, which works on avant-garde projects, notwithstanding limited budgets. Thus it is at the very heart of the future armed forces' capability and forecast approach, as shown by Scorpion global operation that has been launched in April 2010. The aim of this operation is to enhance the effectiveness of combat units.

MBDA



MBDA Milan

SCORPION: Addressing Current and Upcoming Strategic Challenges

The Scorpion programme is designed to ensure the modernisation of the ground combat units GTIA (Combined Arms Task Force). Scorpion is a structuring programme of the French Army and meets one of the chief priorities of the French White Paper on Defence: the upgrading of the French land forces' assets. The study phase of the Scorpion programme was launched on Jan 22 this year by the CMI (Ministerial Investment Committee), chaired by Defence Minister Hervé Morin.

Scorpion aims to:

- replace or modernise the armoured combat vehicles (armoured troop carriers, light and main battle tanks) dating from the 1970s, 1980s and 1990s;
- enhance the protection of the combatants and their equipment;
- improve the efficiency of the soldiers and weapon systems by networking information and combat systems.

According to the DGA, Scorpion leads to the mapping out and development of combined arms task forces, or GTIAs, that are no longer mere additions of armed platforms but global combat systems which put together the combatants and weapon systems via immediate information transmission and sharing. Yet, the Scorpion programme also includes existing assets and ongoing programmes, especially the VBCI infantry combat armoured vehicle and the FELIN future soldier system. It thus complements the equipment of the army with the highest standards.

The preparation of Scorpion began as early as 2005, with a preliminary research programme dubbed BOA (air-land operational bubble). Functional and financial analyses were carried out to deliver the best compromise between the technical and financial aspects of the programme. This preliminary analysis work focused on the timetable

of the programme, its capability and technical aspects and its contractual organisation.

Drawing from this work, the Minister of Defence on Feb 22 this year decided during the Ministerial Investment Committee to follow through with the following steps:

- conduct the programme under an incremental approach so as to reduce risks, especially with regard to the timetable;
- from the outset of the programme, take heed of all costs of ownership (i.e. acquisition and support), which is pivotal to control the overall cost of the programme in the long run;
- implement a "control platform" that puts together officers from the armed forces, the DGA and the industry, which enables it to make the best of design and production choices;
- appoint an architect, integrator of the overall programme and in charge of the information system development;
- have a main contractor from the industry for each major platform;
- identify the optimum systems architecture out of the 13 options presented, to deliver the best compromise between capability and cost.

Scorpion is crucial to enhancing the operational efficiency of the forces. It will be carried out in gradual phases, each of which will include clearly identified key validation steps as well as deliveries as early as possible. The aim is to gradually put the programme's new capabilities at the armed forces' disposal. The DGA, which oversees the overall programme in close coordination with the Defence Staff and the Army, will also operate with an architect from the industry via the "control platform". An invitation to tender is underway to select the architect of the programme. The aim is to implement system engineering tailored to complex systems.

The study phase of Scorpion, launched with the decision of Feb 22, will last until 2012. This



phase consists in finalising a detailed architecture and the technical aspects of the programme, making industrial choices and drawing up the programme's contracts.

This first phase will be followed by the production phase, which is to last until 2020. The production phase will encompass the delivery of the first VBRM multi-role armoured vehicles that will replace the current VAB light armoured vehicles from 2015 onwards, the delivery of the first EBRC reconnaissance and combat light tanks that will replace the current AM 10 RC and Sagaie light armoured vehicles from 2018 onwards, as well as the implementation of Scorpion information and combat systems (SICS) from 2014 onwards.

Deliveries of VBMRs and EBRCs will go on after 2020, while a number of adjustments will be made for the land forces' systems and vehicles according to the evolution of operational requirements.

In short, the Scorpion covers the architecture design, development of the next-generation network-centric battle management system known as SICS V1, and the development of three new armoured fighting vehicles. They are the VBMR multirole armoured vehicle that will be required in two weight categories—a heavy (20-tonne) and light (11-tonne)—and the EBRC, a 25-tonne light tank. Modernisation of legacy assets will also be part of the programme which includes the Leclerc main battle tank and the VBCI. Other elements of Scorpion include a variety of unmanned systems of various sizes and capabilities.

With the Scorpion information and combat system and associated digital kits, the VBCI infantry combat vehicles and the FELIN future soldier systems, all of which will also be deployed in the forces. These equipment will lead to the gradual setting up of 18 Scorpion integrated and digitised GTIAs between 2014 and 2020. About €5 billion will have been allocated to the Scorpion programme by 2020, the DGA said.

The General French Offer

Supporting the export of defence and security equipment is top priority for France and its MoD. The government is thus committed alongside its industry to providing the best possible service to foreign customers with an interest for French land systems.

More than just equipment, full service is provided to the armed services of friendly countries, thanks to the French know-how and operational support put forth in the course of the programme and equipment's whole lifetime. Such international actors as Défense Conseil International (DCI) take part in this process alongside the DGA and the Army. ■



Thales Commander Army systems

Thales