



Case Study

NETWORK ENABLED CAPABILITY

OUR CONTRIBUTION

Forza NEC (Network Enabled Capability) is a project undertaken by the Italian Defence Administration and a pool of Italian companies acting in partnership with the objective of modernising the Italian Armed Forces.

Through the use of Forza NEC, the aim is to optimise the exchange of operational, tactical and logistic information among every single unit or man of the Italian Armed Forces deployed in the field.

We act as prime contractor, system integrator and systems authority for the architectural requirements.

The contract covers the manufacture and integration of command posts in shelters and vehicles, communication, Command & Control devices for soldiers (under the Italian Soldato Futuro programme), unmanned vehicles and aircraft equipped with sensors and systems offering full interoperability between the Italian Armed Forces and the forces of other countries. An integration test bed, comprising a test laboratory consisting of numerous military centres connected in a network, has also been developed.

The project encompasses the supply of the Forza NEC capability to three medium army brigades and an amphibious landing force, together with a set of “enablers”. This ensures all selected units are integrated and digitalized.

Enhanced operational efficiency and resource optimisation, both human and financial, are the key benefits offered by Forza NEC. The main focus of the project is the capability to integrate a variety of Italian Armed Forces platforms, including those already in operation (legacy), into one single C4I (Command, Control, Communications, Computer, Intelligence) architecture. The architecture can be tailored for any kind of platform, within different hierarchical levels.

This process allows digitised Italian Armed Forces units to be employed in current and future operational missions. The availability of this architecture allows any digitised platform to work as a node in a unique Command & Control network, enabling the exchange of secure and reliable information, using standard protocols and data exchange formats.

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The architecture is assured by developments in the new SIACCON system. SIACCON is a Command & Control automated system which supports the exercise of Command & Control at regimental, brigade and divisional levels. It manages the stream of orders and information provided by several Command Posts deployed on the battlefield. SIACCON ensures a perfect communication with SICCONA (Sistema di Comando e Controllo e Navigazione) and C2N-BFSA (Blue Force Situational Awareness), which represent the C2 systems for the Forza NEC vehicular platforms (both Combat, Combat Support and Combat Service Support vehicles).

The adoption of Forza NEC allows the Italian Armed Forces to increase its operational capabilities through the use of advanced technologies. This has particular advantage in operations defined as "other than war", such as the set-up, maintenance and reinforcement of peace-keeping operations and those supporting national stability.

We are prime contractor for the Italian Forza NEC programme. Team partners are the following companies:

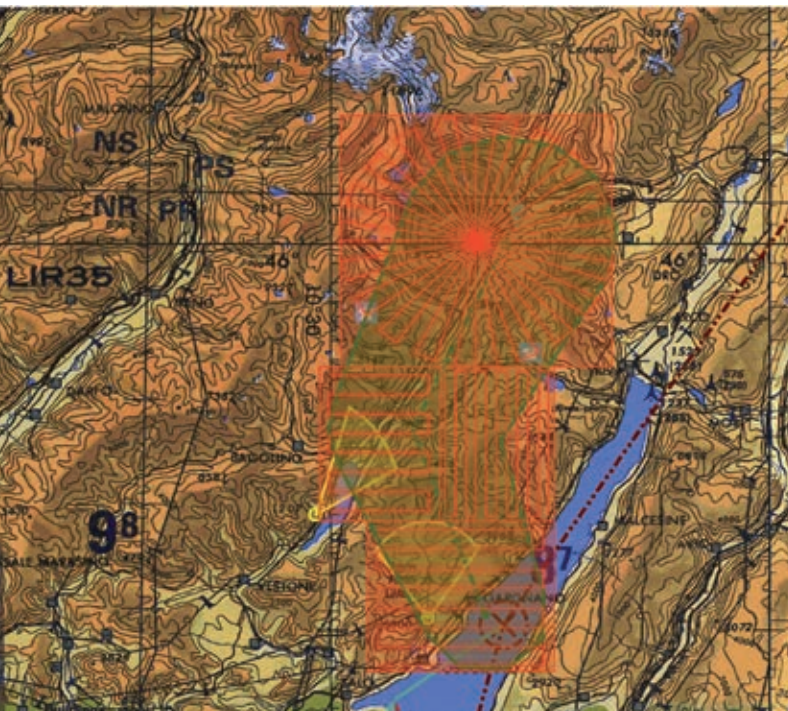
- AgustaWestland
- Consorzio CIO
- Elettronica
- Engineering Ingegneria
- Iveco (Fiat Group)
- MBDA Italy
- Oto Melara
- RTI Iveco-OTO
- RTI Soldato Futuro.

The evolution of operational scenarios

Current operational scenarios are made particularly complex by the presence of friendly units, enemy forces, neutral subjects or civilians, and the juxtaposition of both traditional and asymmetric threats. An additional element of complexity is represented by the more frequent level of intervention by international coalitions and multinational forces. The difficulties of co-ordination are very high due to the differences in operational systems and core technologies.

To manage this growing operational complexity effectively, maximum co-ordination is required among the operational units, coalition units included. This is particularly so during crucial phases of out-of-area operations, such as the deployment of the forces and the activities related to security. This is also true for Operations Other Than War (peacekeeping and peacemaking operations).

A key operational requirement in ensuring the coordination of deployed Italian forces and their effectiveness in conducting assigned missions is the ability to circulate timely information about the actual locations within the theatre of own forces, allied units, potential threats and third parties not related to military operations.



Meeting net centric architecture needs

The emergence of new risks, together with emerging security and defence policies from NATO and the European Union, demand a continuous transformation of military capabilities and their doctrinal concepts. This process should be supported by a substantial commitment to the development of net-centric capabilities and architectures.

In this context, a net-centric architecture means the combination of doctrinal, procedural, technical, organizational and human networked elements which interact and create a significant superiority for the commanded force. Effective net-centric architectures are the prerequisite of multi-national interoperability, and of implementing the new and more effective operational concepts.

Forza NEC supporting Italian digitization doctrine

Italy's development of Forza NEC foresees the digitization of the major systems and components of the digital Forza Media Digitalizzata (Digitized Medium Force) and of the Landing Force Digitalizzata (Digitized Landing Force). It will be tailored to the appropriate size and composition needed for the fulfilment of missions as defined in overall defence planning, with particular emphasis on stabilization and reconstruction missions.

Italian Forza NEC units and their related operational and logistic components are designed and structured in complete compliance with an NEC-type architecture. They are based on the ongoing "Digitalization of the manoeuvring battlespace" program involving other sectors and systems of the Italian Armed Forces.

Nevertheless, thanks to the adoption of standard solutions and data models and through the application of an open architecture design, the solutions and products resulting from the Forza NEC program are ready to be integrated into command infrastructures, platforms and assets of different Nations.

A System of Systems engineering approach

The architectural design principles of a SoS play a key role for the Forza NEC program. It ensures that the technical requirements of the new digitized force and its individual components combine to achieve an integrated force, in compliance with agreed operational requirements related to the specified efficiency level.

The company has developed a strong methodology for the Forza NEC architectural design and experimental verification, ensuring robust technical management of the development, integration and incremental acceptance of the new digitized components.

Command & Control at heart of Forza NEC

Forza NEC success is guaranteed by the company's ability to develop a single C2 architecture, configurable for each platform in accordance with the relevant operational level, and achieving the formation of digitized units needed for future expeditionary missions.

This architecture allows any Italian digitized platform to operate as a single C2 network node and to exchange information securely and reliably, thanks to the use of standard protocols and methodologies. Changes and extensions to the current SIACCON system are incorporated into this architectural implementation.

The SIACCON system offers computerized support for Italian C2 activities required at different hierarchical levels. SIACCON functionalities may be extended at the lower echelons of command, eventually through their integration into already existing tactical C4I systems.



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At the same time, SIACCON benefits from the incremental integration of specialized units into the overall NEC architecture. For instance, intelligence/RSTA capabilities at the operational level are increased once RSTA and UAV/UGV vehicles are integrated into the digitalised C4I infrastructure. SICCONA (Sistema di Comando e Controllo e Navigazione) is the system developed to integrate each combat and combat support vehicle platform into a C4I net-centric network. SICCONA represents a cornerstone in the Forza NEC program, playing the role of the Battlespace Management System. It is able to acquire, manage and disseminate C2 information between other military nodes deployed on the battlefield.

The main subsystems are the Vehicle Integration subsystem (SIV) to manage the platform; the Command, Control & Digitisation (C2D) subsystem, which is responsible for the C2 activities of the platform; and the Communication Integrated Subsystem (SIC) managing platform networking.

SICCONA improves Situational Awareness at tactical level. It provides a Local Operational Picture that displays in near real time friendly and enemy locations, platform and unit status, operational overlays, and horizontal and vertical information exchange. SICCONA, therefore, effectively contributes to the battlefield digitization goal pursued by the overall Forza NEC program.

C2N-BFSA (Command Control and Navigation - Blue Force Situational Awareness) provides, in near real time, Situational Awareness for friendly forces operating in the battlefield. It is similar to SICCONA, except for the integration with the vehicle weapon systems. For this reason, C2N-BFSA has been developed only for tactical transport vehicles.

C2N-BFSA significantly contributes to the Forza NEC digitization goal. It enables each vehicle to visualize friendly positions on a digitized map, thus increasing the Situational Awareness among the nodes of the military network. Similarly to SICCONA, C2N-BFSA allows to exchange information between several moving vehicles, even if they belong to different hierarchical levels of the C2 chain.

The important of integration, verification & validation

Integration plays an important role in Forza NEC. It is central to the effective transition from Italian Armed Forces' current, partially digitized organization to its future, totally digitalized configuration. An initial increase in military operational capability is to be obtained by introducing new systems and equipment into Forza NEC units. The force multiplier effect of digitization will only be fully realised when the capabilities are integrated efficiently and in a transparent way for the system end-user.

This goal is achieved through system integration activities. They are needed to verify the integration of every single component developed within the program into the digitized infrastructure, through intensive and systematic use of Integrated Test Beds.

Forza NEC's integrated logistic support (ILS) is implemented in line with the process generally adopted for the project's integration, in which the overall System of Systems (SoS) capabilities are achieved using the Command & Control (C2) system as the unifying element. At the same time, ILS can support the SoS capabilities as a whole and not just those of individual platforms.

