CRITICAL INFRASTRUCTURES PROTECTION

LEONARDO

The security of sensitive areas (government offices, industrial sites, military zones, prisons, stadia, banks, urban areas, ports, airports, railway stations, metro stations, etc.) is vital to safeguard personal safety and to protect environments, systems, information and data inside these areas; this also applied to the health of infrastructural works such as bridges, roads, tunnels or dams.

Leonardo provides monitoring, surveillance and security solutions for Critical National Infrastructures (CNI) ensuring 24/7 protection to the workforce and infrastructures involved in mission-critical & safety activities and helping to preserve the efficiency of operations.

Surveillance and monitoring technologies deliver physical and cyber protection contributing to a safer working environment and enhanced business continuity.

Leveraging a breadth of expertise across both defense and civil domains, we have developed a range of capabilities to offer modular complex solutions ensuring effectiveness, reliability, security and control of **Critical Infrastructure** operations throughout all lifecycle stages.

As a systems integrator and world leader in sensors development and production, we offer multi-functional integrated solutions to **Engineering Procurement Construction (EPC)** companies and end users.
Our solutions are based both on proprietary and selected third-party technologies, able to meet the increasing operational demands of Critical Infrastructures safety, security and reliability.

Our solutions encompass protection of assets and people through the integration of high performance sensors, physical & cyber security, mission critical communications and process automation systems, in order to provide:

- Long range threat detection.
- Infrastructural health monitoring
- Early threat assessment and comprehensive situational awareness.
- Increased situation awareness and coordination through data and communication management.
- Generation of "standard" and "emergency operating procedures"

BENEFITS

Leonardo is ideally positioned to deliver these user-benefits, given its:

- Deep understanding of security control centers and safety and security procedures in all Critical Infrastructure.

- Strong system integration expertise and flexible integration platforms.

- Scalable, flexible security solutions with embedded operator alert systems.

- Integrated communications solutions employing operation specific technologies.

- In-house Research & Development capability for operational communications technologies, sensors design and command and control implementation.

- Long-standing experience in automation and process control for industrial sector.

Our security solutions address the requirements of infrastructures of this sector in a scalable and flexible way, adapting to different geographic conditions, size, scale, scope requirements and the various threats.

From long-range radar and video based protection to perimeter protection and access control, we can design, integrate, install and deliver a complete range of protection systems to guarantee quicker and more effective threat prevention, detection and response. Subsystem integration at command and control level increases the situational awareness and the solution effectiveness.

Physical Security solutions

Long/ medium range	Radar	Leveraging synergies with other Leonardo division or selected third party products we can provide **radars**, operating in different bands featuring different characteristics and sizes for using in both maritime and ground scenarios
	Electro-Optical (EO)	We can provide Leonardo or third-party high performance **thermal and electro-optic camera** solutions providing medium to long-range surveillance in optical and infrared domains.
	UAV	We provide advanced **Unmanned Aerial Systems (UAS)** to enhance situational awareness and prevent threats alongside both ducts, pipelines and plants.
Perimeter protection	Fences and barriers	Perimeter protection solutions are based on third-party multi-technology products (**microwave barriers, infrared sensors, fencing, taut wires, micro-phonic cables, anti-intrusion**) closely integrated with our video surveillance management system and the Integrated Safety and Security Control Center.
	Sensors	Leonardo can provide internally designed or **third-party sensors** to detect movement and activity and transfer information and data to remote operation centers.
Surveillance and analytics	VMS NVR Video/audio analysis	The company provides systems to manage and control different real-time video technologies. Each video stream can be instantly replayed and recorded for later investigation purposes. Video streams (as well as audio streams) can be processed by company artificial intelligence based video and audio analysis system named **Ganimede** for enhanced detection of dangerous or abnormal situations. Video surveillance and analysis systems are integrated in company **PSIM SC-2** and in coordination and control **platform X-2030**.
Access control	Biometrics/ Plate reading	Access control systems simultaneously manage the movement of vehicles and people through automated identification and superior security performances, thanks to specialized hardware and smart algorithms. Leonardo can deploy analytic based solutions for automated plate reading as well as people identification.

STRUCTURAL MONITORING: WHERE COMPREHENSIVENESS MATTERS

Safety and reliability of infrastructural works such as bridges, tunnels as well as dams, roads and highways is key for the life of modern Country. Leonardo global monitoring solutions ensure sustainability, safety and accessibility of these infrastructure leveraging technology and digitalization

Infrastructural Monitoring

Heterogeneous data collection	Leonardo monitoring solution take advantage of multiple information source and are able to combine data coming from documentation (describing project data as well as historical tests and reports) installed sensors (providing real-time data on response to physical stress) and satellite imagery analysis (providing information on deformation or slip affecting the monitored item)
Data elaboration and digital twin	Digital models of the infrastructure equipped with structural analysis algorithms are fed by collected data and employed for punctual evaluation in response to a given stress as well as forecast of infrastructure behavior along the time
Comprehensive monitoring	Leonardo solution can take into account the dynamic context considering eternal phenomena (e.g. landslides) that can alter the status of the infrastructure as well as accessing relevant information that can increase situational awareness and provide a better decision support

The IT/OT convergence offers advantages for CNIs by enabling new business models and offering a competitive advantage, but it has significantly increased the exposure of industrial environments to cyber threats. Attacks on industrial systems by state sponsored actors, insiders or activist groups are in fact increasing exponentially also perpetrate hybrid cyber warfare activities.

In this threats' evolution scenario Leonardo offers a holistic end to end approach to the cyber security aimed at predicting, preventing, identifying and reacting as early as possible to cyber threats limiting their propagation. This approach allows CNIs to achieve cyber resilience so to ensure business continuity, protection of the corporate image and safeguard stakeholders' interests.
Cyber resilience requires CNIs' operators to have a deep awareness of the main cyber threats that can damage their organizations, and to be able to test and implement promptly, quickly and in a cooperative way the needed actions to stop a threat and to minimize the cyber attacks' impacts.

Cyber Security & Resilience solutions

Risk Advisory & Consulting Services	Leonardo supports Critical National Infrastructures and strategic industries to understand and manage the cyber risks that they are exposed to, covering both IT and OT environments. These services include a proprietary approach and an established process for designing and building on-premises security management infrastructures (SOC, CERT, IOC).
Managed Security Services	Managed security services, provided by Leonardo Global Security Operation Centre, configure and monitor IT/OT/IoT systems' security status in order to identify any breach of security policies to apply appropriate response actions. These services are and natively integrated with threat intelligence services with the aim to enhance detection capabilities.
Cyber Security Platforms	Leonardo services (as well as Leonardo projects) take advantage of in house designed platforms helping CNIs' security operators in their tasks: • **Cyber information superiority suite** composed by a combination of platforms providing threat intelligence, end point protection and malware analysis is based upon Information Superiority concepts applied to the cyber domain to obtain valuable and actionable information, which can be used to rapidly implement targeted defence and containment actions • **Cyber Situational Awareness system** is a complete ecosystem specifically designed to keep CNIs' security teams and executive profiles informed of what is happening in terms of Cyber security supporting decision making and security investigation processes.

Cyber threats are constantly evolving and becoming more and more pervasive and sophisticated; this is determining the need of a diffused awareness on cyber security among end user population and the necessity of constant training and exercise for cyber security specialists.

This is particularly true for the Critical Infrastructure sector because of the wide diffusion of ICT technologies in its vital processes and operations Leonardo can support his Customers with both a cyber-training offer and platforms leveraging innovative technologies and learning methodologies

Cyber Training	
Cyber & Security Academy	An innovative facility in to promote cyber security awareness increase competencies by means of a complete training portfolio delivered by expert trainers leveraging advanced platforms for hands on exercises.
Cyber Training & Exercise	Leonardo provides a proprietary platform designed to train operators through the simulation of extremely realistic and complex scenarios (digital twins). In these scenarios cyber security specialist can test, individually or in group, new attack and defence techniques and verify tools and processes used to protect technological systems

Industrial system as well as transportation or energy infrastructures require fully integrated information and communications solutions that are both reliable and robust, designed to operate in extreme and hazardous environments and during critical and emergency situations.

Leonardo develops turnkey multi technology network solutions that integrate a range of wired and wireless communication technologies (TETRA, DMR and wireless broadband radios such as LTE and 5G) and guarantee transparent user connectivity in all circumstances, for safe and efficient operations.

Typically, we deliver such solutions to first responders, fire brigades, police forces and all user communities who need to communicate during mission critical operations where life matters.
Complete communications packages are available to EPC and End Customers, addressing:
- Transport networks (both wired and wireless)
- Access to wired (LAN) and wireless networks
- PAGA/PABX
- Clock distribution
- Operational communications.

Critical Communications

LTE/5G	**LTE infrastructures** support data intensive applications. Leonardo has a system integration approach providing third party infrastructure to supply extensive coverage, integration of commercial networks, hot spots (with tactical system or network-in-a-box configuration).
TETRA	Adaptanet® is a complete modular, scalable and flexible family of **TETRA products**, satisfying requirements ranging from single-site to national networks. The system supports technology enhancements with full IP communications, and is complemented by terminals dispatching solutions and service applications.
DMR	**ECOS DMR** solutions are characterized by a high degree of scalability and flexibility that allows most suitable configuration for Customer's requirements. The same radio base station can operate in DMR Tier II, with simulcast option and dynamic analogue FM, or DMR Tier III in simulcast or cellular configuration.
Network Integration	The **CSP (Communications Service Platform)** enables the integration of multi-technology networks with unified users and application management and it is at the heart of **Leonardo RIM (Italian acronym for Hybrid multi radio vector network)** supporting the progressive evolution from narrowband to broadband professional communications networks. CSP implement the LMR portion of 3GPP standard LMR –IWF (Interworking Function) allowing the integration of **3GPP MCX** applications.
Push-To-Talk over cellular	**Push-to-talk over cellular** is the way to provide professional services over broadband networks. Leonardo **CSP MCX platform** is a complete solution fully compliant with 3GPP standards enabling mission critical communications over **LTE and 5G**. Designed to take advantage of broadband mission critical enhancement, MCX can also be deployed as an OTT (Over –the-top) application on an existing commercial network and provides an fully featured android client and a web based dispatcher.
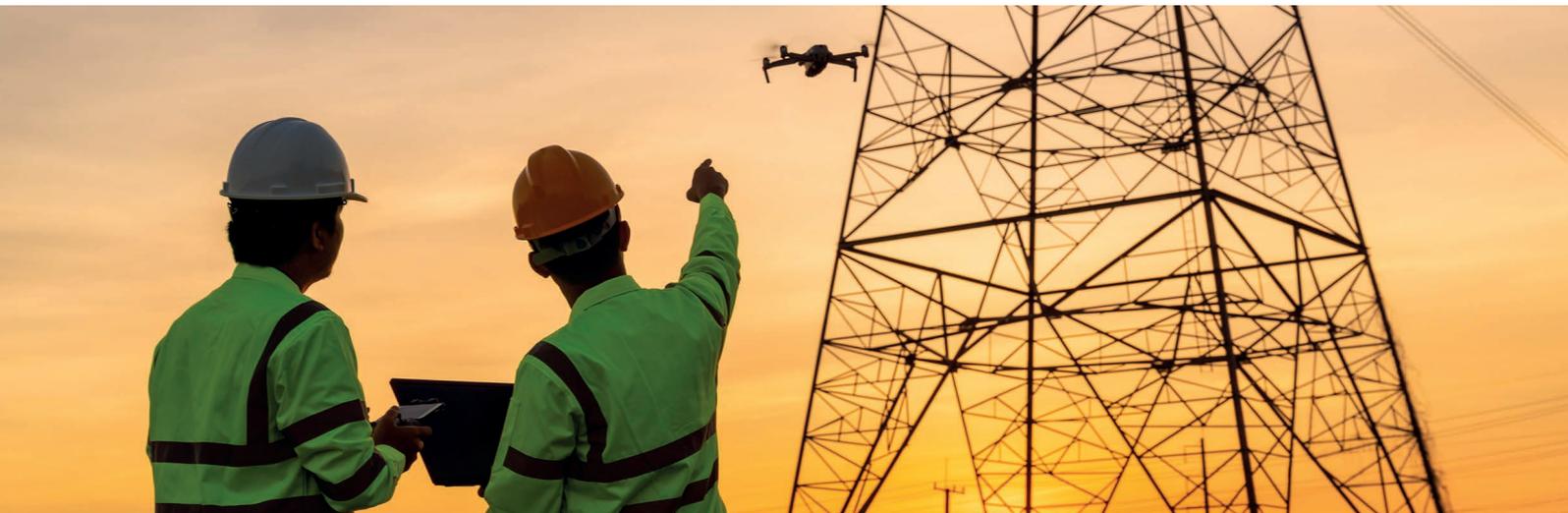
By combining process, system integration and project management capabilities with proven experience designing hardware and software applications, we are one of the main industrial companies able to manage the entire life cycle of automation and process control systems, from consulting and needs analysis with the customer to service levels and personalized aftersales assistance.

Today, the best systems engineering solutions in the field of automation are the result of synergy between multiple competences in specific areas. Our approach therefore involves the integration of our hardware and software products with the best referenced market technologies, appropriately customized through joint initiatives with world leading producers of automation components.

INTEGRATED SECURITY AND SAFETY CONTROL CENTER: WHERE CONTROL MATTERS

Taking advantage of the integration of in-house developed systems with "best-of-breed" technologies, our Integrated Control Center has been designed specifically to address high grade requirements of security and safety in Critical Infrastructure. It enhances situational awareness and improves the ability manage events and situations.
Features can be scaled depending on the customer needs from smaller and less demanding cases to higher and more complex scenarios.
Our Integrated Control Center is able to:
- Integrate a large number of different sensors and subsystems to collect data, events and alarms
- Filter and correlate alarms through the intelligent rule based engine
- Geographically represent the on-field scenario thanks to an effective and flexible GUI integrated with a powerful GIS
- Automate operations and guide operators in the analysis of the situation by following standard and emergency operating procedures
- Boost on-field personnel coordination through the integration of Mission Critical Communication
- Track and record all events to enhance post event analysis, investigation and debriefing activities.

Leonardo provides different platforms characterized by the same technological approach supporting security, safety and process management. Leonardo platforms, are characterized by flexibility, scalability, interoperation capability and feature complete integration with professional communications.

Control Center	
SC2	Physical Security management oriented platform able to gather all data coming from on field fixed and mobile sensors (PIDS, AC, Video Surveillance, UAVs), correlate events and drive operators through the resolution of the incident thanks to the automated workflow system (Orchestrator).
X-2030	A new model of control room system based on C5I concept (Command, Control, Communications, Computers, Cyber & Intelligence) and system of systems paradigm. X-2030 Integrates operational procedures, decision support processes, radio communications and leverages technologies for a superior situational awareness and informed decision making. Designed to integrate existing systems, provides an innovative user interface based on virtual assistant and natural language understanding.

HIGHLIGHTS

Security of critical infrastructures is a key issue both for governments and industrial organizations; Leonardo designs and deploys effective, secure and reliable solutions that take into account the multiple domains affecting the protection, safety and security of infrastructures of buildings, plants, territories and people.

Combining in house developed solutions with selected third party product we support our Customers in protection, security, communications, control and automation addressing the whole solution lifecycle

ABOUT CYBER AND SECURITY SOLUTIONS DIVISION

With experience in information technology, communications, automation, physical and cyber security, Leonardo Cyber and Security Solutions Division generates synergies by joining its expertise to support enterprises, agencies, public safety, security and emergency organizations. Our offer includes solutions for the security and protection of critical infrastructures, transport infrastructures, major events and stadia, cyber security, integrated networks systems and secure communications that enable reliable and efficient information management.

Secure Cloud & Digital

Global Monitoring

Mission Critical Communications

Cyber Security & Resilience

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