



LEONARDO CYBER & SECURITY SOLUTIONS

OIL-GAS AND ENERGY SOLUTIONS



Leonardo's Critical Infrastructure capabilities deliver surveillance and security systems to the Oil & Gas upstream, midstream and downstream companies as well as to energy and utilities companies to provide 24/7 protection to the workforce and infrastructures involved in mission-critical & safety activities helping to preserve the efficiency of operations. Surveillance and monitoring technologies deliver both 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 **Oil & Gas and Energy** operations throughout all stages of the lifecycle.

As a systems integrator and world leader in sensor development and production, Leonardo offers multi-functional integrated solutions to engineering procurement construction companies and end users. Our solutions are based on proprietary technology and third party state-of-the-art products, able to meet the increasing operational demands of critical infrastructure 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
- 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

- Deep understanding of security control centers and safety and security procedures in all Critical Infrastructure.
- Strong system integration expertise.
- 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.

PHYSICAL THREATS PROTECTION

From long-range radar and video based protection to perimeter protection and access control, we 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 effectiveness of the solution provided.

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	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 <u>Unmanned Aerial Systems (UAS)</u> 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 (<u>microwave barriers, infrared sensors, fencing, taut wires, micro-phonic cables, anti-intrusion</u>) 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.
Video surveillance	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.





CYBER PROTECTION

Today's Oil and Gas industry is a technically sophisticated and complex operating environment with an increasing reliance on digitization, data analysis and sensors. While this offers greater operating efficiencies, it can also expose systems to increasing risks and vulnerabilities to cyber-attacks.

Threats and attacks on SCADA and Information Systems are constantly increasing. The majority of attacks are never even detected.

Leonardo can support customers in the design, deployment and management of cyber security and data protection networks, in order to defend and secure customers' IT/OT infrastructures and create new sources of value that reduce costs, improve efficiency and enable growth by enhancing the scalability of the production chain.

Cyber Security

Cyber resilience & Consulting services

Leonardo consulting services are focused on supporting organizations in: governance management, definition of procedures, compliance with standards and regulations, penetration tests and risks management, vulnerability analysis, assets management

Design and build services

Design & Build services are based on a proprietary approach and an established process for designing and building security management infrastructures (SOC, CERT, IOC)

Managed security services

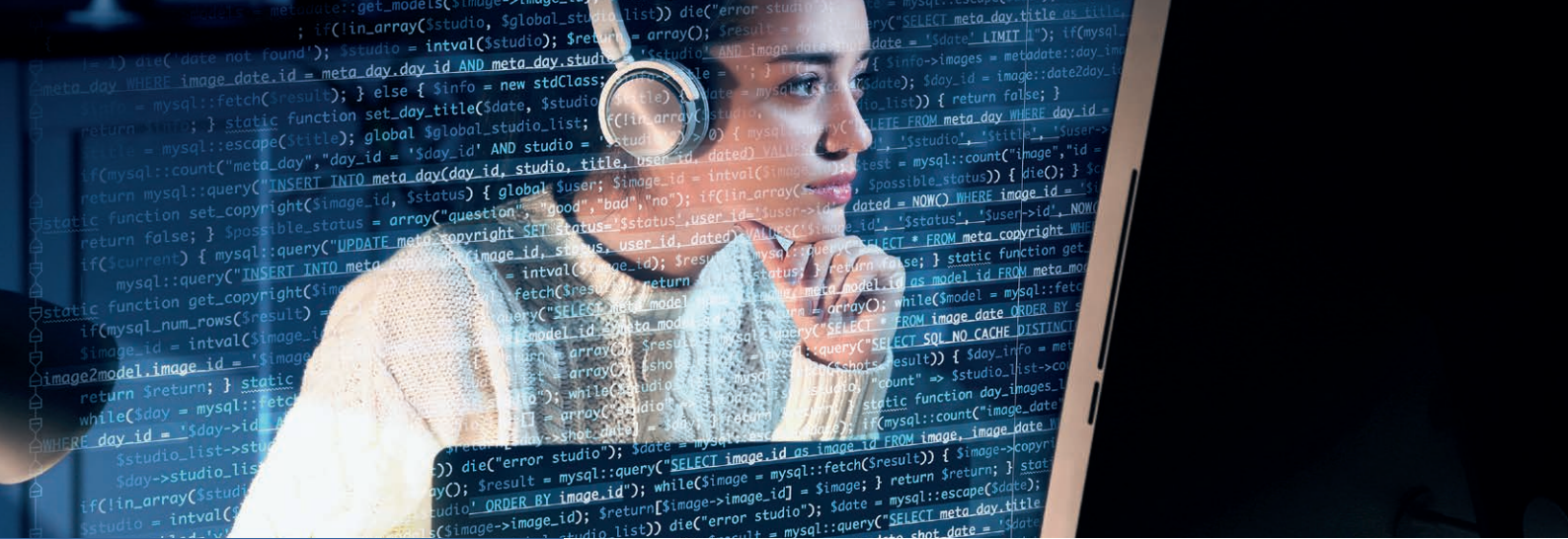
Our Security Operation Centers (SOCs) provide a flexible and comprehensive set of management and monitoring services that can be quickly tailored around an organizations' specific needs encompassing:

- Data, system and network protection
- Deep protocol behavior inspection
- ICS and SCADA protection
- Security management

Cyber security platforms

Leonardo services (as well as Leonardo projects) take advantage of in house designed platforms helping security operators in their task:

- **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 defense and containment actions.
- **Cyber Situational Awareness system** is a complete ecosystem specifically designed to keep an organization's security teams and executive profiles informed of what is happening in terms of Cyber security supporting decision making and security investigation processes.



CYBER TRAINING

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. Industrial sector because of the wide diffusion of ICT technologies in vital processes is feeling these needs as any other technologically advanced organization.

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 Trainer	Cloud-based platform to train and keep up to date both security professionals and non-expert users. Managing the whole training process (training needs, formal learning, exercises, certification)
Cyber Range	Integrated environment for immersive realistic simulations of cyber attack/ defense scenarios and advanced simulation operation to test cyber resilience of system and infrastructures.



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

TETRA	The 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-Simulcast	ECOS DMR solutions are characterized by a high degree of scalability and flexibility that allows selecting the 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.
LTE-5G	LTE infrastructures can support data intensive applications and video monitoring for safety and security purposes. Our LTE Core Service can guarantee standard enforcement and openness to professional applications for private networks.
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



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 to prevent and deter criminal acts. 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 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 squad 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.

AUTOMATION AND PROCESS CONTROL: WHERE EFFECTIVENESS MATTERS

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.





HIGHLIGHTS

Leonardo designs and deploys effective, secure and reliable solutions matching the challenging requirements of oil and gas and energy sector.

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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