



OIL & GAS



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TECHNOLOGICAL INNOVATION WITH A SPACE FOCUS

We are a high value-added technological services and development company specializing in space activities. We have a team of highly qualified professionals and technicians in the main branches of engineering, with extensive experience in R&D&I projects and solving complex problems.

We offer engineering, manufacturing, and production services to the space industry, the oil and gas sector, and the high-tech industry, such as large-scale special machining, 3D metal printing, special welding, ultra-light carbon fiber tanks and selective electronic detonator systems, oil and resistors, along with satellite information services and products applied to oil exploration and extraction.

At VENG, we transform space technology into concrete solutions for industry.

+17 years of
experience

+380

employees,
including
professionals
and technicians

ENGINEERING AND INNOVATION SERVICES

At VENG, we provide highly complex engineering services, combining the technical rigor of the space sector with an innovative approach geared toward industry in general.

Our Aeronautical Mechanical Engineering team has extensive experience in MAIT (Manufacturing, Assembly, Integration, and Testing) processes, following the guidelines of agencies such as NASA and ESA. We successfully transfer this knowledge, forged in the most demanding engineering environment, to sectors such as energy, nuclear, and Oil & Gas, contributing capabilities in the design, integration, and testing of complex systems. At the same time, our Electronic Engineering team develops satellite instrumentation systems and subsystems, excelling in SAR missions such as SAO-COM and Sabia-Mar, and extending that expertise to automation, defense, and industrial process control projects.

In addition to these technical skills, we have our Innovation Laboratory, a space designed to promote creativity, experimentation, and continuous learning. Applying agile methodologies such as Lean Scrum, we develop incremental MVPs and disruptive ideas, generating functional prototypes that allow solutions to be validated before their final implementation. This approach reduces risks and costs, accelerates development times, and encourages early adoption of new technologies by our customers.

At VENG, we view innovation as a daily practice that cuts across all areas of work and enhances knowledge transfer between sectors. This combination of precision engineering, applied innovation, and collaborative culture positions us as a strategic partner for projects that demand technical excellence, creativity, and long-term vision.



SATELLITE INFORMATION

At VENG, we provide high value-added satellite solutions that enhance management, security, and operational efficiency in the sector. **We offer state-of-the-art products and services using information from both the SAOCOM® constellation and other complementary Earth observation satellite systems, allowing us to offer more comprehensive coverage and solutions tailored to every need.**

The SAOCOM® constellation, equipped with a quad-polarization synthetic aperture radar (SAR) in the L-band, represents a unique technology worldwide that allows continuous observation of the Earth's surface under any weather conditions, day or night.

As the official operator of the SAOCOM mission, VENG has exclusive access to its data and operational capabilities. Thanks to this advantage, combined with the use of information from other sensors, we offer extensive coverage over large territorial areas and remote zones, facilitating the continuous monitoring of critical infrastructure, energy corridors, and natural environments linked to oil and gas activity.

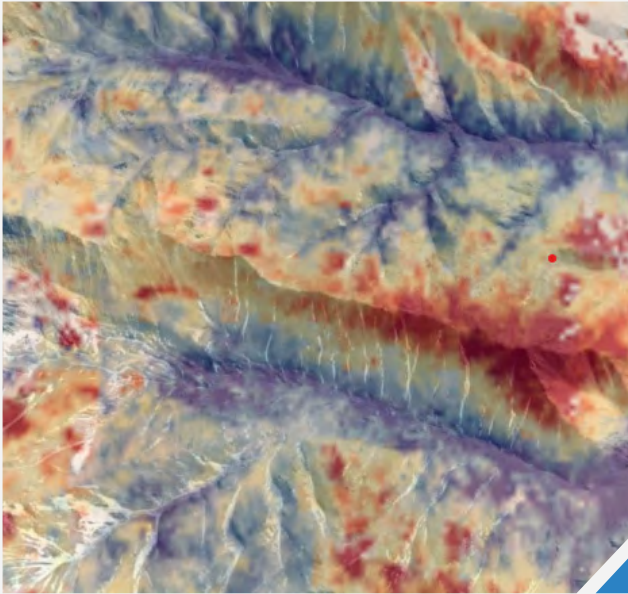
We provide solutions that strengthen management through risk assessment and data-driven decision-making, providing concrete tools for early detection of changes and incident prevention. Our services are highly available and



100% focused on our customers' needs, facilitating the early adoption of satellite technology in their business models.

With a technical team highly trained in radar data processing and interpretation, and our own operational capacity covering the entire management cycle, we guarantee confidentiality, continuity, and availability of information. This combination of experience, technology, and commitment consolidates us as a strategic ally for sustainable development and technological transformation in the sector.

Interferometry and change detection



Interferometry is a technique that uses two or more SAR (Synthetic Aperture Radar) satellite images to measure ground displacement with high precision.

The analysis is performed over a given period, using the differential interferometry (DInSAR) technique to detect and evaluate changes in the Earth's surface.

Interferometric map obtained from the analysis of time series of SAR data. The colors represent the speed of ground displacement over time: red tones indicate areas with high displacement, blue tones correspond to stable areas, and intermediate colors (green, yellow, orange) reflect gradual movement speeds between the two extremes.

Pipeline Monitoring

Pipelines—whether oil, gas, or water—are long linear infrastructures that can reach thousands of kilometers in length. Along their route, they pass through soils of varying composition, such as sand, silt, clay, or different types of sedimentary, metamorphic, and igneous rocks.

These geological variations, together with changes in aquifers or underground reservoirs, can cause ground movements that affect the stability of the pipeline.

Using the technique of differential interferometry applied to satellite imagery (DInSAR), it is possible to detect and monitor ground deformations with centimeter and sub-centimeter precision, using an observation frequency of up to 8 days in the case of the SAOCOM constellation.

This technology makes it possible to identify areas with abnormal ground displacement, anticipating possible structural risks and contributing to the prevention of pipeline ruptures or failures.



Conventional/Unconventional Basin Monitoring

fluid extraction and injection operations produce volumetric variations in basins, which in turn generate changes in the height of the Earth's surface. Given the large spatial development of these basins, measuring such deformations conventionally is complex.

Differential satellite interferometry (DInSAR) allows these variations to be quantified with centimeter and sub-centimeter accuracy, providing key information on the deformation processes associated with production activity.

Based on these measurements, it is possible to estimate volumetric changes in the basin and correlate them with extraction and injection operations, which allows monitoring the infrastructure's integrity, evaluating the subsoil response, and preventing environmental risks. Using the SAOCOM constellation, these studies can be carried out with an observation frequency of up to 8 days, ensuring continuous and up-to-date monitoring of the evolution of the terrain.

Oil Spill Detection

Oil spills in bodies of water or coastal areas pose a significant environmental and operational risk to the oil and gas industry. Early detection and systematic monitoring of these areas are essential to minimize environmental impacts, optimize response efforts, and assess the extent of the event.

SAOCOM satellites, thanks to their L-band synthetic aperture radar (SAR), can detect variations in surface roughness and dielectric properties, characteristics that make it possible to identify the presence of hydrocarbons even under cloudy conditions or in the absence of sunlight (day or night).



By processing and analyzing satellite scenes, we can delimit the extent of a spill, estimate its evolution over time, and detect new occurrences in critical or hard-to-reach areas. In addition, SAOCOM satellite scenes have wide spatial coverage, which allows detection over large regions and simultaneous assessment of multiple areas of interest.

The systematic use of SAOCOM information provides a reliable and operational tool for environmental surveillance, complementing on-site monitoring tasks and contributing to more efficient and preventive management of natural resources.

SELECTIVE ELECTRONIC DETONATOR SYSTEM

At VENG, we developed the Selective Electronic Detonator System (SDES) as a robust and reliable national solution for drilling operations in the oil and gas sector. This product is a spin-off of the launch vehicle destruction system we developed at VENG, such as the VEx: more than twenty years of work in the space industry, where we designed, tested, and integrated critical systems for launch vehicles and satellite missions. That track record and evolution is now being transferred to a technology created specifically for conventional and unconventional wells. Our product is specially designed for plug & perforate operations, allowing the firing trains of a complete string to be initiated on the fly or on demand.

The SDES is suitable for both conventional and unconventional wells and can be used in intermediate casings with side ports from 2 ¾" upwards, making it easy to implement in modular systems. Its compact, functional and robust design achieves a safe and efficient integration into the most demanding operations in the industry.

Our system is designed in accordance with API RP-67 recommendations and consists of: a control unit, a testing unit, selective electronic detonators (Group 2), and a switch for BP3-type resistorized initiators. The 19" rack-mountable control unit is integrated into wireline



Breakdown of the electronic detonation system: Electronic Detonator, firing panels and testing unit, control software.



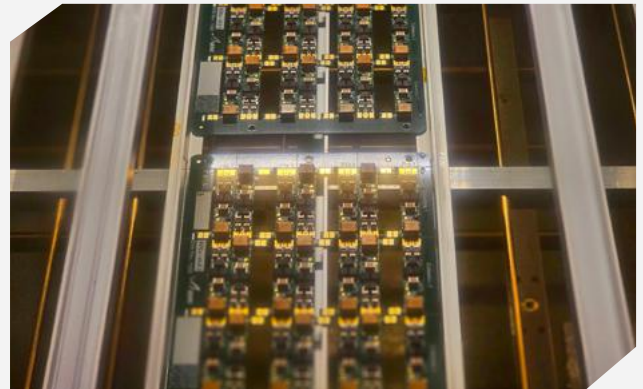
Safe to operate in a radiated field of 100 V/m within the 80 MHz to 6 GHz frequency range, verified in our own facilities and validated by an external laboratory.

trucks and allows operations to be performed from a safe distance. It includes control software and a firing panel with multiple levels of security that require deliberate actions to generate a detonation. Meanwhile, the testing unit allows all electrical connections to be verified on the surface without operational risk, ensuring a controlled and reliable environment.



Each detonator has a three-conductor electrical interface for communication and power supply, with automatic neutralization capability after prolonged immersion, ensuring a superior level of safety. The system operates using coded commands that ensure precision in the selection, preparation, and execution processes, minimizing the possibility of error to the extreme.

VENG's Selective Electronic Detonator was designed to offer stable, safe and robust operation. **It contains no exposed primary explosive, withstands voltages up to 220 VAC without detonation, is immune to electrostatic discharges of +/- 25V 150pF and high-intensity radiated fields (100V/m)** verified by an independent third-party laboratory, and can operate in a temperature range of -10°C to $+125^{\circ}\text{C}$

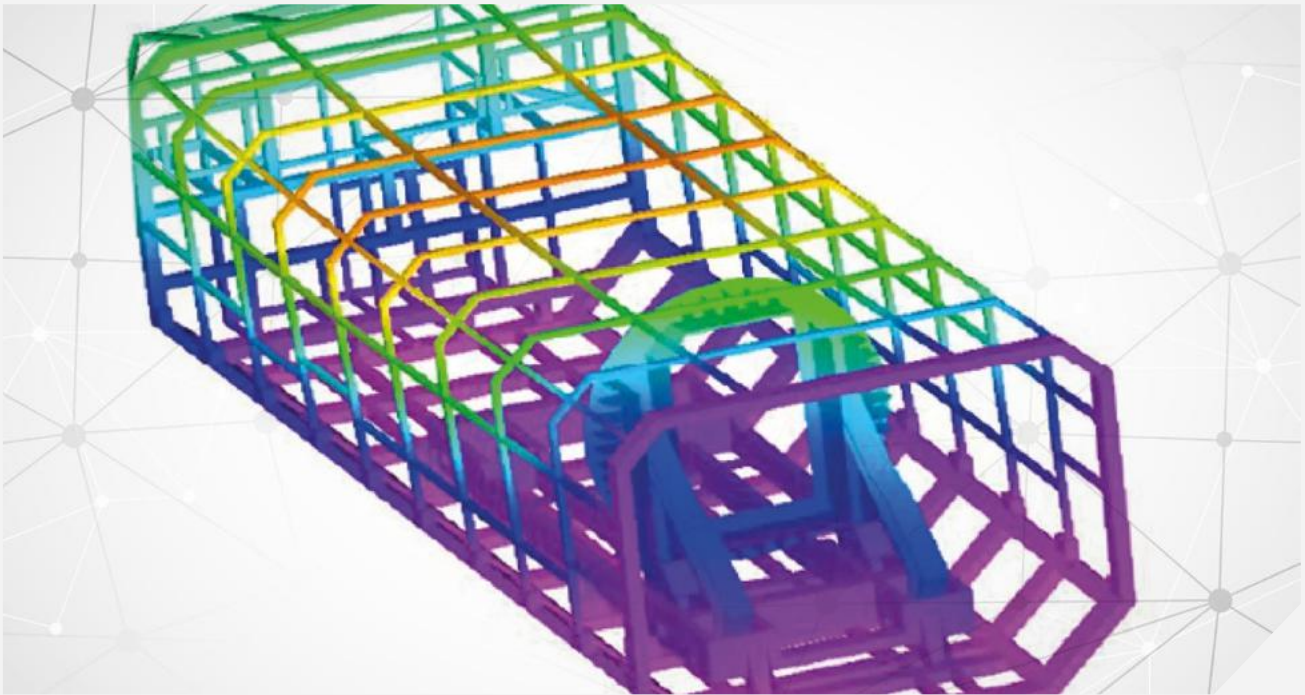


$^{\circ}\text{C}$ with a safety rating of up to $150^{\circ}\text{C}@1\text{hr}$. In addition, it complies with mechanical strength and vibration standards according to MIL-STD-331D.

Our technology incorporates an integrated microprocessor that optimizes power management and ensures secure communications through encrypted commands. The entire system was designed to ensure the correct lateral initiation of detonating cords, providing precision, stability, and reliability in every operation.

The SDES represents a national technological advance. **At VENG, we develop, produce, and provide local technical support, ensuring immediate service availability, after-sales support, and personalized assistance for each customer.** This operational proximity, combined with our experience and engineering capabilities, allows us to offer a comprehensive solution with a high level of security and traceability to respond to the real needs of the sector.

MECHANICAL DESIGN AND ANALYSIS FOR COMPLEX SYSTEMS

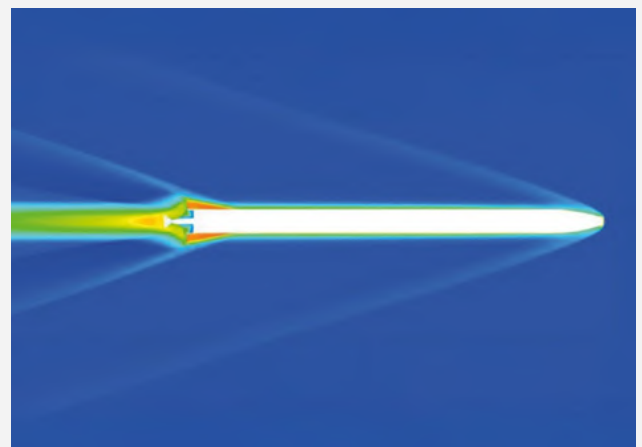


At VENG, we cover the entire engineering life cycle, from requirements management and design to manufacturing, assembly, and functional testing. Our expertise has been consolidated over years of working on highly complex space systems, such as the VEx and Tronador launch vehicles and the SAOCOM satellites, applying the highest standards of quality and precision in the aerospace sector.

All this accumulated experience in precision engineering and extreme conditions is transferred directly to the sector, providing high-value solutions for oil and gas.

Our knowledge of cryogenic fluid systems, high-pressure vessels, com-

posite structures, and customized mechanical tools allows us to offer robust developments adapted to the challenges of upstream and offshore operations, with the same rigor and reliability demanded by the space industry.



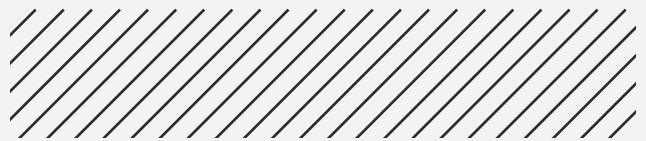
We have advanced mechanical and structural design capabilities, performing 3D modeling, DFM/DFA analysis, and structural optimization using aerospace-grade CAD/CAE tools such as Siemens NX, Ansys, and Nastran. These technologies allow us to develop efficient and safe solutions tailored to each project's needs.

Our infrastructure and know-how enable us to perform environmental and functional tests under extreme conditions, including vibration, thermal vacuum, and acoustic testing, as well as the design and development of customized ground support equipment (GSE) for launch vehicles and satellites.

We perform structural and fluid dynamics analyses (FEA and CFD) that allow us to accurately simulate the behavior of components subjected to seve-

re loads, thermal gradients, vibrations, and fluid-structure interactions, ensuring reliability and optimal performance at every stage of development.

Moreover, we have highly reliable manufacturing and integration capabilities, applied to the development of aerospace structures with metallic and composite materials under controlled clean room conditions and with strict tolerances, ensuring a quality standard comparable to that of the world's leading space agencies.



LARGE-SCALE MACHINING

Friction Stir Welding



A solid-state welding process that uses a non-consumable tool to join two pieces without melting their material. This allows for very high joint efficiencies in alloys where conventional welding (fusion) degrades mechanical properties by a high percentage. For this reason, friction welding is widely used in the aerospace, naval, and military industries to weld mainly aluminum alloys.

At VENG, we have a large CNC vertical lathe that allows us to develop highly complex components with demanding dimensional requirements for the oil and gas industry. With this technology, we can manufacture valve bodies, manifolds, and large



parts that require precision machining and high-pressure milling.

We have extensive part handling capabilities, which allow us to tackle large-volume and heavy projects with efficiency, safety, and traceability at every stage of the production process.

We complement these capabilities with our advanced welding technologies, ensuring the highest structural and functional quality of our products. Our automatic arc welding station (AMI M415 automatic GTAW) operates in a range from 5 A to 400 A, in direct or pulsed current, with automatic arc control. This technique is applied, among other uses, to the welding of metal pipes used in the Oil & Gas industry, allowing for repeatable, precise, and reliable joints under the highest industrial quality standards.

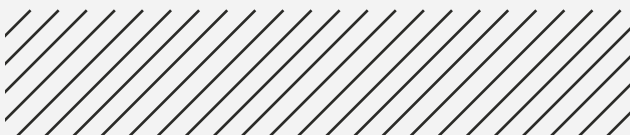
This technological combination positions us as the only company in Argentina capable of integrating large-scale machining, heavy parts handling, and high-precision automatic welding within the same production environment.

This integration gives us a unique advantage in efficiency, quality, and responsiveness, consolidating us as a strategic partner for the development of high value-added mechanical solutions in the energy sector.



Additive Manufacturing / 3D Metal Printing

Additive manufacturing service: 3D metal printing (DMD) and electrodeposition facilities. Our foray into cutting-edge metal additive manufacturing technologies enables us to develop complex parts using simpler and more efficient processes.



Use cases

At VENG, we apply industrial-grade additive manufacturing to solve challenges specific to the Oil & Gas sector, especially in components subjected to demanding loads and accelerated wear. **A representative case is the reconstruction of blades in AISI 316L forged impellers**, parts whose useful life is limited when operating in severe conditions. Our approach consists of recovering the functional geometry of the component and increasing its resistance through the use of higher-performance materials.



Based on the base material of the impeller, we define the parameters and printing strategy necessary to obtain a stable microstructure, reliable mechanical properties, and metallurgical compatibility during deposition. The process integra-

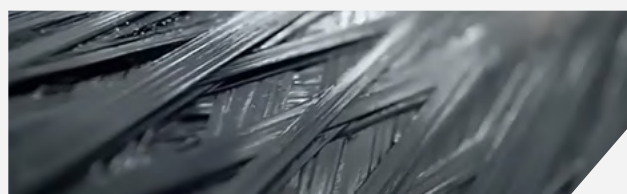
tes preparatory machining, direct printing of new blades using DED technology, and final machining in a single assembly, ensuring dimensional accuracy, repeatability, and total process control.



With this methodology, we are able to repair the part with minimal distortion—on the order of tenths of a millimeter—and reproduce the blades in Inconel 718, a material that provides a substantial improvement in wear resistance. This type of application extends the service life of the impeller, optimizes maintenance times, and reduces costs associated with the complete replacement of critical components, consolidating additive manufacturing as a strategic tool for the energy industry.

RACKS FOR GAS STORAGE

These racks provide a solution for containing and transporting 18 to 36 kg of H₂ at ambient temperature, storing the gas at a pressure of 400 bar.





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