





NAVAL SUPPORT AND EXPERIMENTATION CENTRE



The **Naval Support and Experimentation Centre** (Centro di Supporto e Sperimentazione Navale - C.S.S.N.) is a technicaloperational Body of the Ministry of Defence. Set up in the Mariperman old seat, it started its activity in 2007, following the reorganization of three study and experimentation Bodies: Mariperman, Marimissili and Livorno-based Mariteleradar. The CSSN's dual mission is to manage the Logistic Support Engineering processes for the Navy and to play a leading role for the experimentation and development of the Armed Force scientific and technological programs.



The C.S.S.N. reports to the Italian Navy Logistic Command. As concerns the administrative, contractual and budgetary aspects, it is subject to MARIUGCRA functional coordination. It is located in La Spezia (seat of the Directorate), in Porto Venere, in Livorno/ Tirrenia, in Nettuno and in Augusta.



Thanks to the professionalism and the equipment available, the Centre is a hub of excellence in the military and civil fields, providing skills and expertise that are, in some cases, unique in the national panorama. To fulfil its institutional activities, the C.S.S.N. is organised into departments, offices and sections, employing civilian and military personnel, on active duty, of the Ministry of Defence.

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Naval Support and Experimentation Centre



Additionally, the Augusta-based Degaussing Deperming Station (SDDA), reporting directly to the La Spezia-based C.S.S.N., is the Italian Navy technical-operative Body responsible for specialized experimental activities in the field of Naval Units magnetic protection.

The main task of the SDDA is to best protect Naval Units and Submarines against magnetic influence mines threat, by performing two key activities in the naval magnetic silencing: degaussing and deperming.







Concurrently with the Vallauri Institute, the Centre is also a hub of excellence for research activities involving applied electronics, telecommunications, radar/infrared signature and electromagnetic compatibility.

Considering the broad spectrum of expertise and the high professional level of its personnel, the Centre is capable of developing in-depth studies in various fields of technical/scientific interest. All the tests are carried out by the Centre's laboratories strictly in compliance with military standards; in addition, the whole organization of the Centre operates according to the Quality Management System ISO 9001, certified by the Italian SGS (Service Management System-SMS).

CENTRO

Certificato N. IT18/0323

CENTRO DI SUPPORTO E SPERIMENTAZIONE NAVALE CSSN MARINA MILITARE LA SPEZIA

Sede Legale ed Operativa Viale San Bartolomeo, 400 - 19126 LA SPEZIA - Italia Siti Operativi Viale Italia, 72 - 57127 LNORVO - Italia Via Bigattiera Labo Maec, 28 - 560187 Tirrenia (P) - Italia è tato vertoste et è moltoto contome a resauti d

ISO 9001 / UNI EN ISO 9001:2015

Servizi di supporto logistico integrato a favore di Errit e Unita Navai del Marina Militare Italiana. Esocuzione di verifiche, applicazioni, simulazioni misure nei satori dell'eletto-ottica, della compatibilità elettromagnetica, de sistemi di telecomunicazione, della chimica, della fisica, della meccanica d materiali e delle strutture, degli esplosivi, dei materiali energetici e d propellent



2

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LOGISTIC SUPPORT ENGINEERING DEPARTMENT (REPARTO INGEGNERIA DEL SUPPORTO LOGISTICO - RISL)



THE ESTABLISHMENT OF THE DEPARTMENT

The reorganization of the ITN Missiles (Marimissili) and Platform System Departments has allowed the setting-up of a new Logistic Support Engineering Department, known under the Italian acronym RISL, on 2nd January 2020. Its aim is to provide support to the ITN new generation Naval Units with appropriately integrated shipborne information systems and to update all the logistical data of the Platform and Combat Systems.

MISSION AND CAPABILITIES

In addition to the logistic support provided to ITN Naval Units, the RISL is designed to manage the IT software tools relating to the logistic support and related databases, technical manuals, configuration, equipment, obsolescence's problems, maintainability and reliability as well as the feedback from the field provided by ITN Naval Units upon returning from their missions.



The Integrated Logistic Support "an interdisciplinary challenge" The RISL is structured in three Offices, divided, in turn, into Sections and Nuclei:

- First Office Databases and Info logistic Systems
- Second Office Configuration Management
- Third Office Support Definition

Logistic Support Engineering Department

INFO LOGISTIC SYSTEMS AND DATABASES OFFICE The Office ensures the operation of and the support to all the info logistic systems used by the Department, proposes possible corrective actions, variants, updates for obsolescence and the Systems upgrading, monitors the correct data exchange among the shipborne and ashore info logistic systems, reporting any malfunctioning. Moreover, it ensures the correct management and the constant updating of the Databases within its competence and the alignment of the various shipborne and ashore information systems, also providing support to training-related activities.





SUPPORT DEFINITION OFFICE The Office coordinates the definition of the Logistic Support

It ensures the analysis functions for the updating of the logistic

data in terms of reliability and maintainability of the ship's

systems/equipment and for the definition of their obsolescence

It supervises the lists of on board systems/equipment supply.

activities during the phases of the Naval Units lifecycle.

CONFIGURATION MANAGEMENT OFFICE

The Office supervises the analysis and the consistency of data in the computer systems of the Integrated Logistic Support to Naval Units, for the updating and the standardization of the ship's systems/equipment configuration data.

It also evaluates the accuracy of the computerized Technical Manuals, taking care of their updating, and defines the Logistic Support elements subjected to a technical modification.





"The RISL aims at ensuring a logistic support in line with the current operational needs of the Italian Navy Units in order to meet their Operational Readiness requirements by minimizing, in particular, the management costs using the integrated logistics"



and supportability.

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313







EXPERIMENTATION DEPARTMENT (REPARTO SPERIMENTAZIONE)



The Department manages technical and experimental activities involving systems/equipment of the Combat System (Missile Subsystems, Artillery Subsystems, Sonar and Torpedo Systems, radiated noise measurements of Naval Units and Submarines, experimentations on Unmanned Autonomous Vehicles).

It manages technical and experimental activities concerning systems/equipment of the Platform System (Propulsion Systems, Hull, Generation, Distribution and Electric Power Conversion, Safety).

It ensures the functioning and the operation of the Augusta- (SR)¹ and Punta Castagna-based deperming and degaussing stations for the survey, magnetic calibration and demagnetization of Naval Units and Submarines.

It guarantees the functioning and the operation of the Punta Castagna-based experimental Shooting Range – "Balipedio Cottrau" and the ITN Nucleus headquartered at the Italian Army Firing Range in Nettuno.

It provides support to the study, acquisition, experimentation, technical-operational evaluation, certification, approval, qualification, employment, efficiency maintenance and disposal of systems/equipment relevant to the Combat and Platform Systems.





The Experimentation Department consists of four Offices:

- Missile Systems Office;
- Artillery, Ammunition and Experimental Shooting-Ranges Office responsible for the branch offices:
 - Porto Venere—based Experimental Shooting-Range Nucleus
 - Nettuno-based Shooting Experiments Nucleus
 - Underwater Warfare Office
- Platform Office, responsible for the branch office: - Augusta—based Deperming/Degaussing Station.

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EXPERIMENTATION DEPARTMENT Missile Systems Office

The Office studies new Launch Themes for improving personnel training in the various operational situations or, alternatively, Launch Methods with particular targets and attack trajectories aimed at measuring the operational performance of the sensors, the launch systems and the missile maneuvering capabilities of the various missile systems employed by the Armed Force.





The Office records and analyses all the telemetry data, transmitted during the flight, related to the missile operation, for identifying any critical issues or malfunctions and starting the processes to eliminate the causes.

Moreover, it reviews and plans the capability acquisition to perform on board the extraction and recording of the data required to assess the correct functioning of the new weapon systems and, subsequently, the mission as a whole.

It draws up and carries out readiness programs for the launch of the systems and exceptional efficiency checks.

By means of dedicated IT tools, it carries out simulations of new exercise missile launch methods to verify not only their feasibility, by determining the spatial volumes of the weapon free evolution and the evacuation areas, but also the safe execution of the real launch at the Armed Forces Firing Ranges. Besides, it participates in launch activities both on board ships and in the operations rooms of national and foreign Firing Ranges.



It promotes technical analyses on major failures and provides the most appropriate technical-logistic support for maintaining the systems efficiency.

Furthermore, it provides support to Central Bodies for the execution of the technical-administrative activities connected with the management of the National Military Research Plan and the development contracts for new missile systems, as well as upgrading/new installation contracts.

Subsequently, it supervises all the experimental activities necessary to verify the functional requirements, during their execution.



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EXPERIMENTATION DEPARTMENT Artillery, Ammunition and Shooting Range Office

The Artillery, Ammunition and Experimental Shooting Range Office ensures the execution of technical and experimental activities peculiar to the artillery, fire control and ammunition systems, support to study, acquisition, experimentation, technical-operational evaluation, certification, approval, qualification, use, maintenance in efficiency and disposal, as well as the specific activities of the Support Engineering processes.



The personnel of the Artillery, Ammunition and Experimental Shooting Range Office carry out their activities making use of

• The Experimental Shooting Range - "Balipedio Cottrau"

Artillery Experiments Nucleus based at the Firing Range of the Italian Army Territorial Technical Office in Nettuno

• Firing Range and Artillery and Ammunition Labs;

(Nucleo Esperienze Artiglieri-NEA Nettuno).

different facilities:

Explosive Technology Labs;

based at Portovenere;



The Office deals mainly with all the activities involving both newly designed and /or in use ITN Artillery and Ammunition. In particular, the Office:

- verifies the correct integration, functionality and effectiveness of Artillery Systems and equipment, newly installed or subjected to general overhaul, (for example, the gun laying checks of the fire control equipment, the calibration fires and the verification of gun laying errors on board Naval Units with initial speed measurement and drop points at sea, etc.);
- performs experimental activities relating to the development, qualification and testing of weapons or ammunition in cooperation with the Portovenere-based Experimental Shooting-Range and the Nettuno-based Firing Range.





- defines the electric detonators (preparatory activity for the execution of tests, in collaboration with ITE Livorno, susceptibility testing to electromagnetic fields - HERO tests - on explosive artifacts);
- contributes to the management of the configuration and analysis of the feedback from the field of the artillery systems;
- carries out surveys on technical issues concerning Artillery and Ammunition systems.



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EXPERIMENTATION DEPARTMENT Artillery, Ammunition and Shooting Range Office

The Portovenere-based Shooting Range and the Nettuno-based Artillery Experiment Nucleus (Nucleo Esperienze Artiglieria – N.E.A.) ensure the conduct of all the ballistic and explosive experiments regarding the artillery and ammunition employed by Italian Navy as well as hot and cold tests of artillery materials and ammunition produced by the Private Industry for the Italian Navy and foreign Navies. The Section consists of two Nuclei: the Portovenere-based Experimental Shooting Range and the Nettuno-based N.E.A.



Both bases are operational headquarters for the execution of different types of tests, trials and experiments on artillery systems, weapons, ammunition and structures, many of which carried out for the Private Industry under GFX or exchange system.

Tiri in grotta

In detail, the Section carries out:

Tiri a mare

- testing of artillery systems (in cave and at sea);
- verification of initial, intermediate and terminal Ballistics;
- testing of ammunition powders and functional verification of pyrotechnic devices, fuses in use and explosive material (in cave and in the so-called armored "theater");
- Ballistic testing.

The explosive technological Laboratory carries out all the activities concerning the explosives:

- participates in research programs in the explosive and ammunition sectors with the Industry;
- offers consultancy and organization of burst tests both in air and in water also in support of other Departments, Bodies or Companies;
- carries out investigations on malfunctions relating to explosive artifacts and consultancy on behalf of the Judicial Authority;
- carries out educational activities by organizing post-graduate specialization courses on explosives safety with UNIGE and educational theoretical and practical courses on the use of explosives for ITN Officers and personnel.





- Provides opinions on the ratification and implementation of STANAG on ammunition;
- Participates in Working Groups within the FSAF- PAAMS missile programs, New Heavy Torpedo, etc.;
- Collaborates in the drafting of the Technical Specifications for approval, qualification and suitability for use of new ammunition as technical Body in charge of carrying out and/or supervising the planned tests;
- Ensures that safety, efficiency and extension of life checks are carried out on ammunition in logistic cycle;



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43

EXPERIMENTATION DEPARTMENT Underwater Warfare Office

The Office ensures the execution of the technical and experimental activities, including contractual activities and tests at sea, peculiar to the Systems/Equipment of the Underwater Warfare and all the activities connected to study, acquisition, experimentation, technicaloperational evaluation, certification, homologation, qualification, employment, maintenance in efficiency and disposal at national and international level (i.e. NATO, EDA, EU etc.). The Office is organised in Sections and Nuclei.





Moreover, the Office performs technical and experimental activities on Underwater Equipment and Weapons including Autonomous Systems. It ensures technical and experimental activities on Underwater Electroacoustic Installations and Systems as well as on the Underwater Acoustic Signature. Specifically, it evaluates the acoustic signatures, sonar performance, torpedoes and autonomous systems by means of

firing ranges which record the noise irradiated by Naval Units and Submarines, the underwater tracking of underwater selfpropelled vehicles and the simulation of artificial targets to evaluate the active and passive electroacoustic systems.

and experimentation in cooperation with Universities and Nationa and International Research Centres (NATO and UE) inherent to Systems/Equipment of Naval Units and Submarines, Autonomous Systems and the Projects of the National Military Research Plan. The Office cooperates, in particular, with 9 Italian Universities (established in the University Research Centre ISME (Integrated System for Marine Environment) designed essentially for the development of Autonomous Systems (Joint Laboratory on Heterogeneous Autonomous Systems - SEA Lab). Within this Section, there are positions for PhD Officers on Marine

Robotics, attending the Department of Computer Engineering (DII) at the University of Pisa.





In addition, thanks also to the SEA Lab, the Office supports studies and evaluations of the operational capabilities and new technologies to optimize investments in the sector of underwater innovation. The same applies in comparing and lining up its work programs with NATO STO CMRE (Centre for Maritime Research and Experimentation) hosted within the C.S.S.N. Area to achieve the best possible synergy. These capabilities have allowed the C.S.S.N. to be included among the Defence Test Centres as part of the Database of the European Defence Agency and the Network of the Technological Innovation of the Space Office and Technological Innovation of the Italian Navy General Staff.

EXPERIMENTATION DEPARTMENT **Underwater Warfare Office**





undErwater waRfare), main tool for the support to sea tests, is based on the implementation of a set of modular and reconfigurable unmanned autonomous systems that will

represent the basic elements designed to implement



•CHOBIN (Complex Holistic Outline Based Interoperable Network for Underwater simulation), main tool in a simulation environment, is based on a multi-system simulator of interoperable underwater scenario. This simulator is able to support Testing, Evaluation, Verification and Validation of Systems/Platforms and related Operational Analysis, before using real systems at sea or to obtain an evaluation of complex scenarios; in addition it provides the best technical-operational solution on the basis of the reference requirements. Specifically, it allows of interoperate also with autonomous systems and related simulators.

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EXPERIMENTATION DEPARTMENT Platform Office

RESEARCH AND EXPERIMENTATION







TECHNICAL-ENGINEERING SUPPORT

The Office manages and coordinates the activities of research, analysis and experimentation of the Platform systems/equipment, ensuring technical and engineering support to design processes, verification, testing, certification, coding and failure analysis.

Moreover, it provides support to all Info logistic activities of the Logistic Support Engineering Department requiring a technical approach/evaluation or a coordinated process of internal collaboration with technological labs of the Technical Scientific Department.



DEGAUSSING – FIRING RANGE OF PUNTA CASTAGNA

The La Spezia-based **Punta Castagna Station**, mainly dedicated

applicazione dell'Additive Manufacturing e più in generale dei concetti di Industria 4.0 nella struttura del Supporto Logistico in ambito navale

prototipazione di nuovi elementi meccanici da testare

individuazione e ingegnerizzazione di idonei materiali

Verifica sperimentale di materiali e stampe prototipiche

certificazione dei processi di stampa 3D

verifica di eco-sostenibilità delle nuove tecnologie...

3D PRINTING

The Platform Office studies the applicability of the Additive Manufacturing to the Logistic Support of the Naval Units.

The experimentation has already concerned the engineering, production and test of an impeller for 30t/ h electric pump made of nylon carbon with 3D printing technology, FDM (fused deposition modeling) type.

The experimentation results open important prospects in a variety of areas of study and many opportunities of collaboration with the local companies.

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EXPERIMENTATION DEPARTMENT

PLATFORM OFFICE Degaussing Deperming Station of Augusta



The Office performs activities of study, acquisition, testing, technical-operational evaluations, certification, qualification, maintenance in efficiency of Naval Units/Submarines magnetic silencing.

in particular:

- Preparation of requirements and technical specifications;
- Generation and updating of documentation and national/ international regulations;
- Preventive maintenance on the systems;
- Training of military and civilian personnel;
- Simulations for the modelling of the operational scenarios;
- Participation in national and international Working Groups.

DEGAUSSING – SDD AUGUSTA

This technology involves cyclic passages on the bases of the firing range measure; the resulting magnetic signature of the Ship allows to calibrate the on board magnetic compensation system, designed to minimize the hull static magnetic signature.

The ship's equipment performs the magnetic compensation (degaussing) by activating an electric "belts" system surrounding the hull, capable of generating an artificial magnetic field, being equal and opposite to that of the Ship.





DEPERMING - SDD AUGUSTA

This technology is performed on iron Units to reduce the permanent magnetism of the hulls.

The most used procedure is known as Flash-D and is applied to Units without magnetic compensation system (Degaussing).

Its purpose is to minimize the Ship's static magnetic signature, by generating a permanent vertical field being equal and opposite to the induced one (particularly efficient in a predetermined area of operations).

DEPERMING BARGE

Hull made of reinforced fiberglass: 25-meters length and 135-tons displacement.

The JDG-10 barge has a computerized management system for the activation of the currents for the magnetic treatment and monitoring of the Units.

Two thermoelectric generators are installed on the barge, for the demagnetization pulses capable of supplying overall 1 MW of power, as well as the electric cable required for the winding of the turns.





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TECHNICAL SCIENTIFIC DEPARTMENT (REPARTO TECNICO SCIENTIFICO)



MISSION AND TASKS

The Department performs activities of study, acquisition, experimentation and certification for the Defence Administration, external Bodies and Private Industry.

It carries out analyses and tests for the subsequent homologation and/or qualification of products/materials of interest for the Defence Administration.

It provides training courses for civilian and military personnel of the Defence Administration and external Bodies.

The Scientific Technical Department is located within the compound of La Spezia, hosts chemical, physical and technological laboratories where study and analytical activities are performed.





STRUCTURE

The Department is managed by a civil Director assisted by a secretariat and is organized in two Offices directed by **Specialized Officials:**

- Office of the Machines and Materials Physics
- Office of the Materials Chemistry

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They are divided, in turn, into Sections and Nuclei.

TECHNICAL SCIENTIFIC DEPARTMENT

OFFICE OF THE MACHINES AND MATERIALS PHYSICST

This Office consists of two Sections – Laboratories:

- Section of the Materials Technology and Non-Destructive Testing (NDT - C.N.D. in Italian) -
- Section of Dynamics, Mechanics and Machines. The last one is organized in three Nuclei:
 - PDA Nucleus
 - Vibrations and Noise Nucleus
 - Structural Analysis and Simulations Nucleus.





Within the Office's activities, it is worth noting the capability to carry out blast-test trials, as well as the expertise on all the types of NDT with qualified and certified personnel up to third level.

The most significant activities include certifications and structural verifications on submarines. Materials and equipment qualifications for vessels are also carried out. Of particular importance are the Failure Analysis activities, involving the whole Department.

OFFICE OF THE MATERIALS CHEMISTRY

This Office consists of two Sections-Laboratories:

- Section of Applied Chemistry
- Section of Explosives Chemistry •
 - The first one is organized, in turn, into three Nuclei: • Painting Nucleus

 - Instrumental and Metallographic Chemistry Nucleus
 - **Fuel Nucleus**





Within the Office's activities, analytical tests and studies are performed on materials of interest for the Italian Navy and/or other Defence Administration Bodies and, upon request, for I.P., in particular:

- Study and chemical characterization of materials and non-explosive processes
- Study and chemical and technological characterization of materials and energy processes - explosives
- Analytical activities for consideration for private subjects



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TECHNICAL SCIENTIFIC DEPARTMENT Office of the Materials Physics

DYNAMICS, MECHANICS AND MACHINES SECTION – ANALYSIS NUCLEUS

- Static and dynamic experimental analysis of the stresses and vibrations, by means of strain gages and accelerometers, also on board submarines;
- Vibrations of the hull-girder;
- Dynamic analysis of the propeller shafts and measurements of turns, torque and power of the rotating shafts;
- Predictive and diagnostic analysis of the rotating machines based on the measurement of self-induced vibrations.





VIBRATIONS AND NOISE NUCLEUS

- Structural noisiness of the hull of Naval Units and Submarines;
- Noise measurements of machines and work environments;
- Measurement of the sound absorption coefficient of insulating materials;
- Blast-test during firing activities by guns and missile launch, including measurements of structural stresses, accelerations, sound pressure, temperatures and pressure in air.

PDA NUCLEUS

Measurements of pressure in water generated by underwater explosions;

Qualification of shipborne machinery and equipment according to the NAV and MIL regulations, by means of shocks tests simulating the effects of underwater explosions and vibrations with vibrating plate, with acceleration measurements.





Environmental tests at high and low temperature, in dry, humid and humid-salt atmosphere by means of climatic chambers, saline mist chambers and thermal shock chambers;

Microclimatic measurements of temperature, moisture, speed of the air and environmental luminosity.



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TECHNICAL SCIENTIFIC DEPARTMENT Office of the Materials Physics



TECHNOLOGICAL SECTION OF MATERIALS

- Technological tests such as traction, compression, fatigue, hardness and resilience;
- Failure analysis of single elements or complex mechanical systems, also installed on board Naval Units;

- Measurements of residual stresses by the method of the perforated strain gauge rosette;
- Qualification of compensatory joints, thermal insulators and dielectric mats;





Non - Destructive Testing by:

- Penetrating liquids
- UltrasoundsRadiography
- Magnetic particle inspection
- Magnetic particle inspectionThermography
- Endoscopy

- Technical support within the certification of welding processes and of welding machines for the construction of submarines;
- Technical support within the certification of the submarines for the employment of the U.S. Navy rescue systems.







TECHNICAL SCIENTIFIC DEPARTMENT Chemistry of Materials Office

- APPLIED CHEMISTRY SECTION PAINTING NUCLEUS
- It performs:
- Chemical analyses on pictorial products/cycles to verify the characteristics and the compliance with the reference Technical Specifications for the issue of the approval by Navarm;
- Elementary chemical analysis made with inductive coupling plasma-optic emission spectroscopy technique (ICP-OES) on metal alloys, environmental samples, paint pigments and battery electrolytes of submarines.





ICP-OES



GC-MS

FTIR - ATR

APPLIED CHEMISTRY SECTION – INSTRUMENTAL AND METALLOGRAPHIC CHEMISTRY NUCLEUS

It performs:

- Chemical analysis made with Fourier transform infrared (FTIR) spectroscopy and attenuated total reflection (ATR) of polymeric organic compounds;
- Determination of volatile organic compounds made with gaschromatography-mass spectrometry (GC – MS);
- Metallographic analyses.

It performs:

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APPLIED CHEMISTRY SECTION – INSTRUMENTAL AND METALLOGRAPHIC CHEMISTRY NUCLEUS

It performs the determination of the concentration of airborne asbestos fibres made with scanning electron microscopy (SEM) technique and X-ray micro-analysis system (EDS) in accordance with the Ministerial Decree of 06.09.1994 (since 2011 the laboratory has been included in the list of the laboratories qualified by the Ministry of Health of Liguria Region).



APPLIED CHEMISTRY SECTION – FUEL NUCLEUS

Analysis of lubricating oils, fuel and oil products;

Analysis of foaming liquids.



Flash Point



Point

Bagno Viscosimetrico



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TECHNICAL SCIENTIFIC DEPARTMENT Chemistry of Materials Office

EXPLOSIVES CHEMISTRY SECTION

In the explosive materials sector, the Section performs: qualitative and quantitative analyses, compatibility tests, qualifications and suitability for employment, thermal characterizations, life expectancy of safely storage, activities of investigation on incidents; it organizes courses on the safety of the explosives; takes part in national and international working groups. Outside the explosive sector, it can perform activities of thermal characterization of natural and synthetic





It performs:

- The thermal characterization and chemical compatibility of explosive materials using the Differential Scanning Calorimetry (DSC);
- The thermal characterization and chemical compatibility of explosive materials using the Thermogravimetric Analysis (TGA).

It performs:

organic materials.

- The determination of the chemical composition of explosive mixtures using High Performance Liquid Chromatography (HPLC);
- Analysis of pyrotechnic devices using the ion chromatography (IC).







It performs studies/evaluations of the thermal stability and the degradation over time of explosives by the

microcalorimetric analysis with TAM III.



TAM III









"GIANCARLO VALLAURI" INSTITUTE Viale Italia, 72—57127 Livorno



The CSSN-ITE – Giancarlo Vallauri Institute, is a Test and Evaluation (T&E) Centre of the Italian Navy.

The Institute's mission is to study the scientific and technical problems in the field of telecommunications and electronics, the experimentation of prototypes, the conduct of measurement campaigns for Naval Units in terms of telecommunications and sensors as well as electromagnetic compatibility and RADHAZ.

A separate structure of the Institute is located at Tirrenia, near Pisa, (about 20 km from Livorno). It hosts some specialized laboratories, among which an external firing range for antenna measurements, a Compact Range for equivalent radar surface surveys in controlled environment and a Hazard of Electromagnetic Radiation to Ordnance (HERO) laboratory. Moreover, the Institute features a reconfigurable mobile laboratory, for possible measurement activities outside the area.





The Institute directly reports to the Naval Support and Experiment Centre (C.S.S.N.) at department order level, is headed by a Captain (ED Corps), assisted by a Department Secretariat, a General Services Office and a Scientific Technical Office, organized in three sections (Sensors, EM Compatibility and Telecommunications).

The CSSN-ITE main structure is located in Livorno, in the Naval Academy compound. This location offers an ideal environment to carry out test activities in air-sea complex scenarios.

"GIANCARLO VALLAURI" INSTITUTE

SENSORS SECTION

Radar/IR Signature Nucleus:

- IR signature simulation of Naval Units and aircraft;
- Survey and analysis of IR signature of Naval Units and aircraft;
- Validation campaigns of IR systems;
- Monostatic RCS on the basis of roll and pitch, time and frequency;
- 1D/2D imaging radar;
- Characterization of absorbing radar materials (RAM, RAS) and selective surfaces in frequency (FSS).





SENSORS SECTION

Electronic Warfare Nucleus:

- Performance analysis of Electronic Warfare systems;
- Simulation, generation and analysis of electromagnetic scenarios for testing electronic warfare systems.

Radar Nucleus:

- Measurements of operational radar performance;
- Generation and simulation of scenarios for testing radar systems.

E.M. COMPATIBILITY SECTION

- EMI/EMC measurements on equipment/systems to be installed on board Naval Units. (MIL-STD 461/462F).
- Survey of the ship's electromagnetic environment on the basis of HERO, HERE and HERA (MIL-STD 464A);
- Measurements for the HERO characterization of ammunition and weapon systems containing electro-explosive devices;
- Measurements of the electromagnetic attenuation of the COMSEC premises of Naval Units (STANAG 4557).







TELECOMMUNICATIONS SECTION

- ROS survey, radiation pattern, analysis of problems concerning the installation of radiant systems;
- Electromagnetic simulation of Naval Units with SHIP-EDF software (TLC and RCS);
- Verification of antenna performance on models on a scale of 1:50 in antenna fire range;
- Study, experimentation and test of new technologies and systems;
- Support and management of research and development activities.

