

NATO Science & Technology. Smart Defence. Today.

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With the NATO's Undersea Research Centre, NATO owns a rare centre where high value capabilities are dedicated to a mission: Discover tomorrow today.

Smart Defence. Global Solutions. Today.

In a quiet location on the Italian coast, just south of the World Heritage Site, the Cinque Terre, Smart Defence and global solutions are ambitions which are brought to life at NATO's Undersea Research Centre. A cradle of innovation and discovery, NATO's Undersea Research Centre's (NURC) daily mission embodies the three constituents of Smart Defence; specialization, prioritization, and collaboration.



In today's environment, NATO is under more operational pressure than at any time in its history. In a period of focused austerity, wavering public opinion and fragile budgets, member nations are intensely mindful of expenditures and tangible return on investments. At the same time, NATO is focusing on the rebalancing of defence spending between its European members and the United States. Member nations seek critical capabilities that are deployable and sustainable at minimum risk with maximum results, both in the political as well as military domains.

Science and Technology's Role in Smart Defence

As part of his Smart Defence initiative, Secretary General Anders Rasmussen stated his priority is to invest "in science and technology and creating greater coherence within Europe." Science and Technology (S&T) is the collective scientific and engineering collaboration by nations to create opportunities for innovation, interoperability, speed-to-capability, and to protect against technological surprise through a systematic process of discovery, invention, test and evaluation.

NATO and NURC

In partnership with Allied Command Transformation (ACT), a Scientific Program of Work (SPOW) outlines a way ahead which provides a scientific foundation for military capabilities that address member nation's highest priority operational shortfalls. Staffed with a cadre of world leaders in science, technology, and engineering, NURC produces critical results and understanding that are built into operational concepts of NATO and the nations. This cooperation and collaboration reduces development costs for national laboratories and industries while providing world class scientific research and engineering capabilities and facilities accessible to all member nations.

For over 50 years, NURC has specialized in the study of over 70 per cent of the global terrain, i.e. the world's oceans. Over 90 per cent of world trade and commerce travels on the world's oceans and sea lines of communication. Maritime security, maritime situational awareness, port and harbour protection and energy infrastructure security are just some areas of focus which benefit member nations and partners around the world.

Non-lethal Technology; Strategic Impact

In this realm, NATO's Emerging Security Challenges Division Defence Against Terrorism recently sponsored the multinational Harbour Protection Table-Top Exercise (HPT2E) from 20-23 March at NURC using the OpenSea Tactical Theatre Simulator (TTS). HPT2E focused on the protection of military forces, shipments, and critical civilian infrastructure in ports and harbours during times of high threat alert. Using serious gaming with cutting-edge modelling and simulation methodologies and technologies, NURC collaborated on emerging security challenges and anticipated solutions with representatives from ten member nations during the three-day exercise. Non-lethal technologies were integrated into the serious games environment. The virtual reality construct of the simulator allowed these technologies to be

employed and exercised in a realistic manner where such testing in a real exercise would be prohibitive. Non-lethal technology can have a strategic impact in some nations where NATO is currently engaged. Successful application of non-lethal weapons in asymmetrical warfare or areas of high threat has the ability to reduce escalation of force incidents, reducing civilian casualties, and better enables local national ground forces to control riots or other such stability-threatening incidents without causing lasting or permanent injuries to the local populace. Strategically, the minimization of such incidents actively denies propaganda opportunities for insurgent elements, which rely on them as force multipliers to compensate for their small numbers and inability to confront national security forces directly.

Importance of Technology Readiness Level

While non-lethal and other technologies are being tested for application today, other programs are focused on progressing the Technology Readiness Level (TRL) of newer and untested science and technology required by NATO as established through the programmes of work. TRL is a measure used to assess the maturity of evolving technologies (materials, components, devices, etc.) prior to turning that technology over to operators for policy and procedural development. New technologies are usually subjected to experimentation, refinement, and increasingly realistic testing. Once the technology is sufficiently proven, it can be incorporated into an application.

NURC is NATO's only entity that can work through most of the TRL spectrum, from TRL 1 (Research) to TRL 7 (Technology demonstration) due to its extensive array of ships, laboratories and research facilities. These assets include NATO's only two collectively owned research vessels, the world class staff of scientists and engineers, and considerable collaboration with numerous scientific, academic, military, and industry partners. The quietest ship in its class, the NATO Research Vessel (NRV) Alliance was designed to minimize noise radiating from the ship into the water, making it an excellent platform for sonar testing and other types of research where a quiet undersea environment is essential. Unique due to its ability to set various conditions of silent running in addition to interact with and handle classified military materials, the 98-metre, 3,180-ton, open-ocean research vessel offers 400 square metres of laboratory space and state-of-the-art navigation, computer, and communication equipment.

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