

Undersea Warfare



Key focus area – statement of work

Background

Effective and deployable Undersea Warfare (USW) capabilities are a critical element of Australia's ability to deploy military power to shape our environment, deter actions against our interest and, when required, respond with military force.

Undersea surveillance and response systems are capabilities that are a vital element of our defence strategy. Rapidly emerging technology and innovation offers Navy opportunities to improve its ability to perform the current roles and missions required. Automation, artificial intelligence, digitisation and modular technologies enhance Navy's ability to operate in the most cost-efficient manner possible in a drive for greater affordability and increased capability. In particular, the application of persistent undersea surveillance provided by deployed sensors and sea-denial systems will both sustain and maintain Navy's capability edge.

Navy requires risk reduction and active management systems to support operations in littoral and open ocean environments; and it is imperative that Navy's assets remain covert during these operations. Due to the continuing rapid evolution of technologies, it is expected that deployed sensor and denial systems will be an enduring challenge faced by the Australian Defence Force.

Context

Maritime capabilities are required to operate in highly contested environments, placing considerable focus on the importance of efficient and effective sensors and denial systems. The Royal Australian Navy will be expected to operate continuously in remote, high threat, competitive environments. In these environments, the introduction and use of innovative sensor and denial system technologies aims to provide military advantage for Defence.

From 1 July 2022, the Defence Innovation Hub will seek innovative technologies that provide both deployed sensor and denial systems for Navy. Technologies are expected to be capable of providing a high level of efficacy to respond to the evolving maritime threats, within the constraints of size, weight, power and cooling considerations for maritime based assets.

Scope

Specifically, the Defence Innovation Hub is seeking:

1. deployed sensor technologies that enhance undersea surveillance; and
2. denial systems for naval platforms that allows timely response to threats.

Below is a list of some examples of potential technological innovations. This list of examples is not exclusive however, Tenderers are required to address the sensor deployment, automation of sensor operation, and integration into defence systems as part of a Submission.

Deployable Sensors

Defence requires novel ways to develop different sensor systems that can be deployed in a range of situations, e.g. at speed, altitude, and pressure to enhance maritime detection over a greater geographical area and increased range. There is a preference to support size, weight, and power

(SWaP) principles for innovations to enable multiplatform deployment. Below are technology areas of interest, which are not exclusive:

- Low-cost, semi-persistent and easily deployable undersea sensor systems with a focus on passive or active acoustic sensors that may be supplemented by non-acoustic sensors (e.g. magnetic or pressure) integrated on a common platform.
- Fibre optic sensor technologies
- Acoustic and non-acoustic sensor technologies, including above water sensor, e.g. able to detect periscope or divers from far distances. Examples of non-acoustic include:
 - magnetometers
 - multispectral optics
 - LIDAR
 - chemical detection
- Deployable decoys – Simulating submarine platforms, active sensors or undersea weapons.
- Littoral positioning modules
- Passive and active sonar processing systems

Sensor types must also consider:

- The ability for rapid or mass manufacturing – contributing to ease of scalable local production. Asymmetric, non-conventional launch capabilities. To be operated from basic or austere platforms (using common commercially available boats, trawlers, utes, trucks etc). Key being small low-visibility/common platforms.
- Preferably to be stowed, transported and/or deployed from a shipping container or smaller footprint.

Automated Denial Sensor Systems

Defence requires novel ways to manage and automate different sensor systems that can be deployed in a range of situations. Tenderers must consider how sensor information will be automated in the detection and classification of data. Below are sensor system areas of interest, which are not exclusive:

- remote sensor management
- machine learning / artificial intelligence
- sensor power, management, and communication technology
- deciders fusion / multi-sensor integration / track management
- time dominance at tactical edge
- trusted systems and information assurance
- decider collaboration
- near real time processing
- sensor networks and communications paths

Trials and testing

Tenderers should outline in their Submission how they intend to develop the proposed innovation. Submissions may request access to Defence assets or information that will support testing and demonstration events, however, Tenderers should note that access to a submarine will not initially be provided by Defence.

Indicative timeline

Stage	Estimated Date	Milestone
Call for Submission	01 July 2022	Call for Submission Opens
	31 August 2022	Submissions Close for KFA Funding eligibility.
Request For Proposal	Individual Tender notification of Submission outcome (evaluated and notified as early as possible)	If successful Submission, Release of Request for Proposal.
	March 2023	Tenderers notified of Request for Proposal outcome.

Total funding available

Defence has allocated up to AUD \$10,000,000 (GST exclusive) for this Key Focus Area over three years (2022-23 to 2024-25). Defence is under no obligation to fully expend this amount. Any investment decision under this procurement process will be made in accordance with the best procurement practices and guidelines to achieve best value for money for the Commonwealth.

More information

For more information including how to make a submission as well as resources to assist you prepare visit: www.innovationhub.defence.gov.au