Advanced In-Water Maintenance Solutions for Royal Navy – Open Call

Call 1 Overview – In-Water Inspection

Problem Statement

The Royal Navy has an immediate and enduring requirement to improve its routine inspection activities, of which there are a range of specific needs to address key problem challenges. The Navy operates a number of vital UK assets of which long-term integrity and inspection is key to their continued operational availability. In collaboration with Babcock Marine, the Navy is looking to modernise its practices and benefit from utilising the best innovation that the underwater sector has to offer.

Routine inspections are usually undertaken in dry-dock facilities or less frequently, in-water at quayside facilities. Through the adaption and adoption of proven, modern technologies and methodologies, the opportunity exists to increase the volume of in-water inspections to satisfy through-life integrity management requirements traditionally undertaken by visual inspection in a dry-dock facility. In turn this will increase assets' operational availability, reduce human intervention and dry-docking durations.

In-water inspections (internal and external) are currently performed either by air divers or ROVs on a variety of steel pressure vessels, ballast tanks, pipework, pipe fittings (e.g. flanges) and structural members. Air-divers are generally used to perform close visual inspections and conventional non-destructive examinations such as MPI, EPI, ultrasonic etc whereas ROVs are generally used for general visual and cathodic protection inspections.

Challenges that typically exist include -

- Confined space and hazardous environment working
- Corrosion mapping and inspection overlay to enable condition monitoring and predictability
- Inspection accuracy and reliability including feature mapping & recording
- Operational challenges around simultaneous operations
- Coating breakdown, removal and biofouling
- Hard to access / inspect geometries
- Mixed wet & dry surfaces
- Navigating known defects / anomalies
- Integrity assessment and classification process

Requirement Guidelines

The items below provide an indicative outline of the technologies required to enhance in-water inspection operations.

- Equipment to be deployed in water by diver or RUOV up to depths of 20m
- Survey to be undertaken in submerged, semi-submerged and dry areas where biofouling may be present

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- Any data captured must be accurate to low tolerance uncertainty levels
- The ability to overlay or compare surveys enable continual condition monitoring and predictability. Advantageous for the data and imagery to be easily transferrable in a universal format that offers flexibility to capture and perform data / drawing referencing offering the ability to perform analysis and 3D imagery.
- Equipment must fit through aperture of 1m x 0.5m as a minimum, and ideally through an aperture measuring 0.3m x 0.3m. It would be advantageous if could fit into more restricted spaces 350x230mm up to 5m and manoeuvrable around pieces of structure.
- Data communication does not necessarily require real time data transfer, however, may be considered an advantage.
- Provide illumination if required for data/image capture.
- Equipment must be capable of being security accredited to capture, store and transmit classified data.
- Equipment must be capable of capturing accurate and repeatable data i.e. it must be capable of returning to specific areas time after time with a high degree of accuracy +/-1mm.
- Equipment must be capable of capturing high-definition video and photographs, if applicable.

Applications of Interest

The technologies outlined below are likely to be of relevance to this Call.

- NDE technologies equipment & techniques
- Coating removal and breakdown
- High Quality Underwater Cameras for visual inspection of areas with restricted access
- Sensors and sensor mapping
- Tethered and untethered robotic vehicles – tracked and/or free-flying
- Integrity data management & assessment solutions
- Condition monitoring
- Diving equipment

Call 1 Milestones

06 June 2022	Call 1 Opens for Registration of Interest
30 June 2022	Call 1 Information Webinar hosted by GUH, Royal Navy & Babcock Nuclear * Registration of Interest required for Webinar participation
08 July 2022	Call 1 "Expression of Interest" Submission Close
August Date TBA	"Supplementary Information" Submission Close
September Date TBA	Presentations to Royal Navy, Babcock Nuclear, GUH representatives