

## **Hydroacoustic Supplier Event 2026 – 10 September 2026**

### **Purpose of this document:**

The purpose of this document is to outline the key technical needs related to the maintenance, sustainment, and future development of the International Monitoring System (IMS) Hydroacoustic (HA) Hydrophone Network. It is intended to inform potential stakeholders about the technical areas that will be discussed at the Hydroacoustic Supplier Event which will be held at the Vienna International Centre on 10 September 2026. (2nd day to be confirmed)

### **Background:**

The IMS Hydroacoustic Network has eleven stations in total. Six of the IMS HA stations are hydrophone stations cabled to shore (Figures 1 and 2). The remaining five stations are seismometer-based T-phase stations.

The hydrophone stations consist of two triplets (except for station HA01) of 1-100 Hz frequency band hydrophones, suspended by bottom-moored risers at least 500 m above the sea-floor, near the axis of the Sound Fixing and Ranging (SOFAR) channel. The hydrophones of each triplet are separated horizontally by 2 km, data is digitized at the triplet and sent to shore via fiber-optic link, from there it is time-stamped and transmitted in near real-time to Vienna (Austria) via satellite link.

The IMS HA hydrophone network was completed in 2017. The oldest HA hydrophone station is 26 years old and the median age of the hydrophone network is 20 years.

For further technical background on the IMS network's design and performance, see [REF1].

### **Description of the Technical Need:**

1) Periodic maintenance and repair activities required for the existing six cabled Hydroacoustic Hydrophone stations within the International Monitoring System:

a\*) Periodic replacement and upgrading of Shore Terminus (ST) equipment such as the Digital Data Formatting Interface (DDFI), which provides the interface to the fibre-optic-electrical trunk cable, digital data formatting, GPS synchronized time-stamping, and power control for the cabled underwater system as well as the Power Supply units. All onshore subsystems are located inside the On-Shore Central Recording Facility (CRF).

b) Diver-based inspection of near-shore underwater cables and carrying out reinforcement and repair works of the cables and their protections in sections where required.

c) Implementation of fiber-optic cable repair operations in case of damage to the subsea fiber-optic cable. These may include deep-water repairs, as most cable depths in the IMS hydroacoustic network up to 2500 m, while the hydroacoustic station HA11 trunk cable reaches maximum depths of approximately 5200 m.

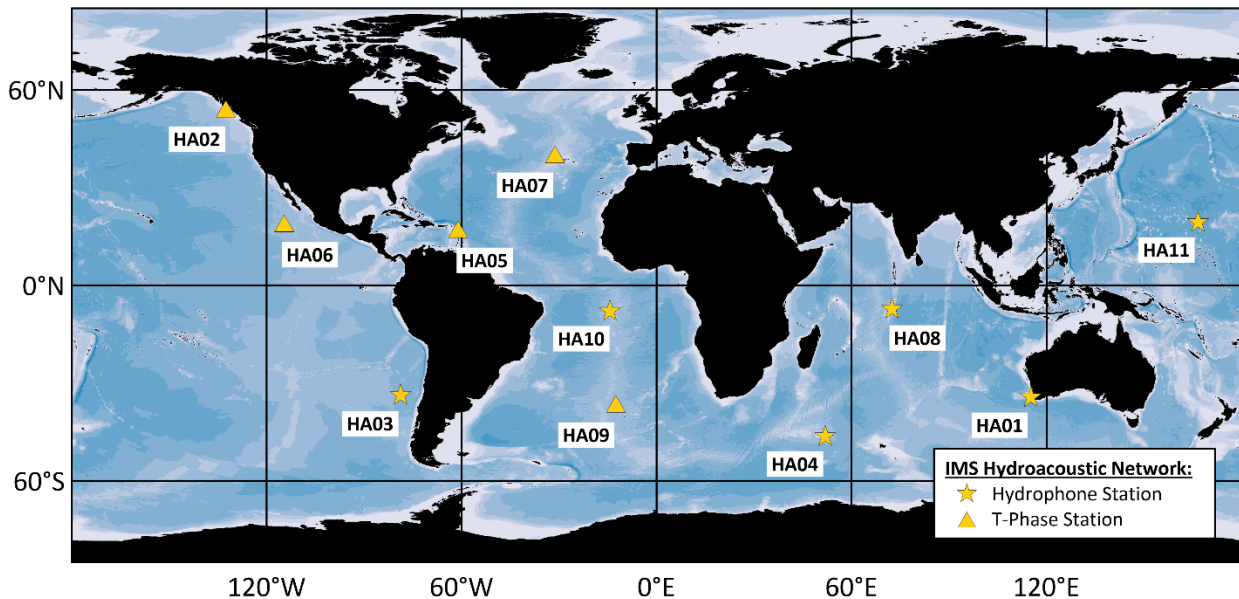
d\*) Troubleshooting and repair activities in case of failure of the hydrophone triplet or the digitizer located in deep water.

e\*) In-situ end-to-end acoustic calibration of the stations.

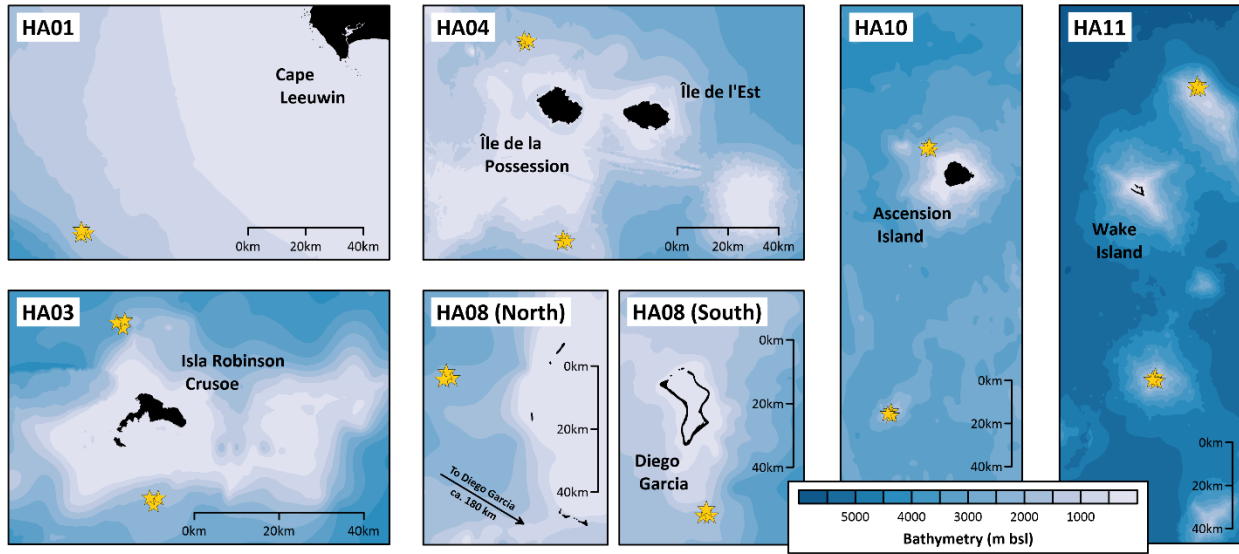
2) With a view to potential future replacement of aging/failed hydrophone stations or underwater subsystems, design, development, testing, characterization, and installation of a next-generation hydrophone station prototype for the monitoring of acoustic events in the deep-ocean environment aligned with the existing system concept.

3) Development and implementation of pilot projects to assess emerging technologies for underwater acoustic monitoring applications and station state of health assessment, including but not limited to Distributed Acoustic Sensing (DAS).

*\* This may require additional development phases.*



**Figure 1:** The IMS HA network. Stars represent the Hydrophone stations.



**Figure 2:** Layout of the six IMS HA Hydrophone stations.

[REF1] [“The Comprehensive Nuclear-Test-Ban Treaty Hydroacoustic Network”, in Twenty-five Years Progress of the Comprehensive Nuclear-Test-Ban Treaty Verification System, pp. 63—91 \(CTBTO, April 2024\)](#)

[REF2] [Marking 30 years of the Comprehensive Nuclear-Test-Ban Treaty \(CTBT\)](#)

[REF3] [CTBT30 | CTBTO](#)