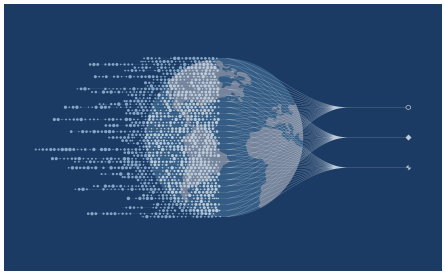

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# of IMS hydroacoustic hydrophone stations, and technical approach to their sustainment

With the certification of the hydroacoustic hydrophone station HA4 Crozet in 2017, the International Monitoring System (IMS) hydroacoustic network became the first component of the IMS to be completely certified. Six of the 11 IMS hydroacoustic stations are cabled hydrophone stations with triplets of hydrophones suspended by risers in the deep sound channel; the remaining five are T-stations with nearshore seismometers placed on land. This work focuses on the analysis of the lifecycle of the hydrophone stations, considering separately (i) the onshore subsystem with the Central Recording Facility (CRF), on land and underwater nearshore trunk cables, and (ii) the further offshore underwater system (UWS) with trunk cables and hydrophone triplets in deep water. The lifecycles of each of these two subsystems differ by an order of magnitude; for example, the electronics components in the CRF have lifetimes around five years, while the "unrepeatered" undersea trunk cable can be expected to be functional for three to four decades if undamaged by external aggression. Approaches to sustaining these stations are described, and different scenarios are envisaged for UWS repairs in case of subcomponent failure, with the associated technical and economic efficiencies. The potential future role of modular design solutions is also discussed.

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