



## **Re-establishment of the IMS Hydroacoustic Station HA03, Robinson Crusoe Island, Chile**

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Water column hydrophone stations of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) International Monitoring System (IMS) comprise typically two triplets of moored hydrophones deployed on both sides of an island. Triplet distances vary approximately between 50 – 200 km from the island, with each triplet connected to the receiving shore equipment by fibre-optic submarine data cables. Once deployed, the systems relay underwater acoustic waveforms in the band 1 – 100 Hz in real time to Vienna via a shore based satellite link. The design life of hydroacoustic (HA) stations is at least 20 years, without need for any maintenance of the underwater system (UWS).

The re-establishment of hydrophone station HA03 at Robinson Crusoe Island (670 km West of the Chilean mainland) is presented here. The station was destroyed in February 2010 by a Tsunami induced by an 8.8 magnitude earthquake. After a major engineering and logistical undertaking HA03 is now back in operation since April 2014. The main phases of the project are presented: (i) the installation of a shore facility for the reception of the hydrophone data from the UWS, which also relays the data back to the CTBTO International Data Center (IDC) in Vienna via a real-time satellite connection, (ii) the manufacturing and testing of the system to meet the stringent requirements of the Nuclear-Test-Ban Treaty, and (iii) the installation of the UWS with a state-of-the-art cable ship.

Examples of data acquired by HA03 are also presented. These include hydroacoustic signals from the 1 April 2014 magnitude 8.2 earthquake in Northern Chile, bursting underwater bubbles from a submarine volcano near the Mariana Islands (15,000 Km away from the station), and vocalizations from the numerous marine mammals which transit in the vicinity of HA03. The use of CTBTO data for scientific purposes is possible via the virtual Data Exploitation Centre (vDEC), which is a platform that enables registered researchers to access archived monitoring data and processing software, or via the National Data Centres (NDCs).