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## **nodes: Design and development of a novel mechanism which enables the repair of individual underwater components in IMS hydrophone stations**

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The six hydroacoustic hydrophone stations within the CTBTO's International Monitoring System comprise a total of 11 triplets. These triplets have a 20-year design life with no scheduled underwater segment maintenance actions and are based on a linear non-modular design which offers the advantages of high reliability and efficient deployment in one continuous operation. However, a triplet employing modular components and Wet-Mate Connectors (WMC) has an advantage in that replacement of a failed component(s) in-situ becomes possible without disturbing the remaining functional system components, or requiring replacement of the entire triplet. For these reasons a modular design triplet that maintains the efficient deployment of a non-modular linear system has been investigated. A critical component that has been developed is a latch mechanism that secures the cable terminations to the node structure. This isolates the WMC plug and the cable from the deployment stress which they are otherwise unable to sustain. After deployment, the latch can be opened; should a repair then become necessary, detachment of the cable and termination can be undertaken by an ROV. The design principles, the status of fabrication and testing of the modular cable latch are presented, along with the envisaged development of a prototype.

### **Promotional text**

A modular component was developed to enable in-situ repair of hydroacoustic underwater triplets down to component level, while at the same time preserving the advantages of the robust and efficient deployment of the legacy linear triplets.

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