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US Navy's "Full Ship Shock Trials" as Opportunities for USGS and CTBTO Seismic System Evaluation and Calibration

The Navy conducts "full ship shock trials" (FSST) on new warships to assess the combatant's ability to withstand the effects of nearby underwater explosions. On June 10, June 23, and July 16, 2016, three FSSTs were carried out on a Littoral Combat Ship off the Florida coast. The three events, with magnitudes in the range of 3.7-3.8, were well recorded in the eastern United States by the U.S. Geological Survey (USGS), resulting in 78, 82, and 114 associated phases, respectively. The hypocenters (based on standard single-event method) computed by USGS and CTBTO fall inside a small hexagon separately defined by the Navy. The CTBTO's seismic bulletin has the first and third FSSTs reported, but not the second. The CTBTO/IMS seismic stations in the United States, Canada, Turkey, Finland, and Australia saw some of these events. In addition, five hydrophone channels at IMS Ascension Island hydroacoustic array detected two events. The CTBTO/IDC did not "screen out" the FSST events as earthquakes. The best calibration data for seismic monitoring are from those controlled active-source experiments for which the Ground Truth are known. The Navy's FSSTs have the potential for evaluation and calibration of the seismic systems operated by the USGS and CTBTO.

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