

VSW Navigation/Communications Assessment

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Abstract: It is increasingly being recognized that navigation and communications systems play an ever-expanding role in the proliferation and application of autonomous underwater vehicles (AUVs). The objective of this study was to quantify the impact of high accuracy navigation requirements on the performance of these systems within an MCM scenario.

The assessment quantified the UUV navigation requirements based on the time to complete a mission (i.e., search an area to a specific probability of detection/classification (PdPc)). The assessment also examined the communication capability required in terms of defining a required data message (size, content, transmission/

storage time, etc). We investigated four different navigation concepts/tactics used to search a 1000 by 8000 yards region that varies in depth from 10 to 40 feet. A lawnmower search with a uniform track spacing of 30 yards was used for each case. The results showed that tactics were a big driver and in some cases, having a high accuracy INS unit on a UUV can be detrimental to overall mission performance. This assessment was conducted using the Autonomous Littoral Warfare Systems Evaluator – Monte Carlo (ALWSE-MC) simulation developed by the Coastal Systems Station (CSS).

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