Small UUV High Priority Technology Areas

1) Buried Mine Hunting (Classification); A small UUV capability needs to be developed and demonstrated to detect and classify, at standoff ranges up to 30 meters, threat mines that are 100% buried below the seabed. Goal is PdPc of 0.7 for buried targets. This capability needs to address feasibility of packaging the sensors onto a prototype 8.5" diameter UUV to show compatibly with existing/projected UUV power/volume/weight/processors. It is envisioned that the subject technology program will develop the a prototype sonar into a small package to fit on a 8.5 " diameter UUV and will gather data, in a not to interfere basis, with other communications and navigation systems currently onboard fleet fielded small UUV MCM platforms, i.e. SCULPIN or SAHRV. Data would be processed post mission (within hours of returning) for evaluation of more robust object detection/classification metrics.

2) Obstacle Avoidance Sonar (including vehicle control algorithms); A small UUV capability needs to be developed and demonstrated that allows the UUV to operate in and around areas of irregular bottom types and general obstacles, both natural and man-made. The function of the subject VSW MCM UUV system is, " to conduct unmanned clandestine exploratory and reconnaissance MCM missions in the VSW zone to enable amphibious landing operations." Frequently this mission involves encountering obstacles in the water column. The technology needs to allow UUV and associated sensor packages to thoroughly search areas for mines, specifically that the presence of obstacles will not create search "holidays" in the area of interest. It is envisioned that the subject technology program will develop the a prototype sonar into a small package to fit on a 8.5 " diameter UUV and will be compatible with existing/projected UUV power/volume/weight/processors. This technology will include both hardware and software, i.e. vehicle control algorithms, components to be integrated into the small UUV system.

3) High Rate, mid range, U/W Communications & Long Range RF Communications: A small UUV capability needs to be developed and demonstrated to enable multi-rate, multi-user acoustic communications for dynamic and static platforms that will provide reliable communications in excess of 50-Km*Kbit/sec. This capability will support both AT/FP (hull search) and stand off MCM UUV operations. Mobile Communication links will allow further maximizing the performance by introducing a degree of autonomy in optimizing the acoustic link. The solution needs to be functional in multiple operational depths and adaptable to changing environmental conditions. Also, a capability needs to the developed and demonstrated to enable multi-rate, multi-user, Line-of-Sight (LOS), Over-The-Horizon (OTH), and world-wide RF-communications. Communication rates should compliment using low bandwidth (2.4 – 10 Kbits/sec) worldwide communication capability through the DOD gateway. The technology to acquisition transition product will include a C/NA communication/sensor suite design package, the communication/sensor suite hardware, a T&E data collection package, and performance analysis report documentation.