

2005 Abstract Form – External/Shared Projects (funded fully or in part with an external grant). Deadline for abstract submission is 8:00 a.m. on July 27th.

ABSTRACT FORM

NOTE: *Continuing projects should enter the same internal project number **AND** use the same project title from the previous year.*

Internal Project Number:

External Project Number: 701024

Project Title: AUV Arctic Change - ALTEX

Project Manager/PI: James Bellingham

Lead Scientist:

Lead Engineer:

Project Description:

The goal of this external project, funded by NSF, is to greatly increase access to the Arctic Ocean by creating and demonstrating a safe and economical Autonomous Underwater Vehicle (AUV) platform capable of basin-scale surveys. In the earlier phases of the effort, the ALTEX vehicle was designed, built and operated on a cruise in the Arctic. We hope to use the remaining NSF funds in 2005 for publication of project results and for exploring docking options. The latter activity is envisioned as coupled closely to MBARI's interest in developing docking stations for MOOS and MARS. Docking is attractive for Arctic applications because it would allow uncrewed ice stations to support AUVs for extended deployments in the Arctic basin. Broad area coverage is achieved because ice drift

The ALTEX vehicle was the prototype for the currently operational Dorado CTD vehicle. Thus much of the development costs for our current AUV operational capability was borne by the NSF project. Work in the 2000 and 2001 ALTEX effort focused on the development and integration of core vehicle systems. These efforts culminated in an Arctic cruise in October/November of 2001. This cruise focused on testing of the ALTEX AUV and its sub-systems, and hydrographic survey in the ALTEX operational area to refine possible vehicle trajectories. Project efforts in 2002 through the present have focused on data reduction and analysis, communication of results via publications and workshops, and developing reliable methods for extended deployments. Little work has been directly carried out on the ALTEX project due to unavailability of Mark Sibenac and the recent move of Hans Thomas to DMO.

Reliability studies comprise most of the progress this year, as these are key to extended deployments of AUVs. These efforts leverage off the Dorado vehicle's routine water column surveys, which have now achieve well over 1000 km of operations. A database of failure modes and component wear is being developed and these statistics being used to plan modification for a vehicle that would be capable of extended deployments to support docking. A framework was prepared and preliminary analyses were performed from the design and specifications of the ALTEX vehicle. They specific types of analyses are: (a) Reliability Block Diagram (RBD), (b) Fault Tree Analysis (FTA), and (c) Failure Mode, Effect, and Criticality Analysis (FMECA). These results are being written into a paper that will be presented at the MTS/IEEE Oceans 2004 Conference in Kobe, Japan.

For 2005, this effort is contingent on NSF granting an extension of funding. Assuming we are successful in our request, we will use the NSF funds to publish results of the Arctic cruise, and develop a docking station plan. While there are insufficient funds in this effort to complete docking work, the expectation is that this would carry across to the internal docking project.

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Abstract Phase: LABOR Resource Request Form

Project Title: AUV Arctic Change - ALTEX

Project Manager: James Bellingham

Lead Scientist:

Lead Engineer:

Please place an “X” to the left of the resources you expect to need for this project, as well as next to “<10” (less than) or “>10” (more than) to indicate estimated need.

Development					
X	Development: Electrical Engineer	X	< 10 days		> 10 days
X	Development: Software Engineer ¹		< 10 days	X	> 10 days
X	Development: Mechanical Engineer	X	< 10 days		> 10 days
X	Development: Eng. Technician ²		< 10 days	X	> 10 days
X	Development: Support Engineering ³		< 10 days	X	> 10 days
X	Development: Machinist		< 10 days	X	> 10 days
ITD					
	ITD: Video Lab/Samples Tech		< 10 days		> 10 days
	ITD: Technical Writer		< 10 days		> 10 days
DMO					
	DMO: Ocean Observatory Tech		< 10 days		> 10 days
	DMO: CTD Instrumentation Tech		< 10 days		> 10 days
	DMO: Diver		< 10 days		> 10 days
COO					
	COO: IS Administrator		< 10 days		> 10 days

¹ Includes John Graybeal, Kevin Gomes, and Andrew Chase, previously in IAG.

² Engineering Division Technicians (Jim Schofield, John Ferreira, Dick Littlefield, Mike Parker, Tom Marion, Jose Rosal, Larry Bird, and Karen Salamy)

³ Includes Rich Schramm, Mike McCann, and Brian Schlining, previously in IAG.