

# APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH

## 1. General Information

1.1 Cruise name and/or number:	DASH-ST8LA - F2014-018
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1.2 Sponsoring institution(s):		
Name	Address	Name of Director
Defense Advanced Research Projects Agency (DARPA)	Mr. Andy Coon DARPA -STO 675 N Randolph St. Arlington, VA 22203 USA	Dr. Arati Prabhakar

1.3 Scientist in charge of the project:	
Name:	Michael Palmieri
Country:	US
Affiliation:	Applied Physical Sciences Corp.
Address:	4301 North Fairfax Drive Arlington, Virginia 22203-1652 US
Telephone:	703-516-7006
Email:	mpalmieri@physci.com

1.4 Entity(ies) /Participant(s) from coastal State involved in the planning of the project:	
Name:	See Section 6.2.
Country:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

## 2. Description of Project

2.1 Nature and objectives of the project:
DASH ST-8LA is an engineering test of a deep ocean unmanned undersea vehicle (UUV) designed for deep ocean sonar research. The UUV will be deployed to depths up to 4500m and evaluated for stability and autonomous station keeping. Reliable acoustic path (RAP) deep ocean propagation will be studied via a coordinated test with a surface echo repeater. While operating at depths below 3600m, an acoustic projector on the UUV will transmit short waveforms at 5 minute intervals to a towed echo repeater system operating at 50-100m. The echo repeater will re-transmit the received waveform where it will be received by the deep UUV. Data telemetry from the UUV will also be evaluated via a station keeping surface buoy. The buoy will relay acoustic communications from the deep UUV to a satellite network for in-situ data evaluation ashore. To assist in further stimulating the station keeping surface buoy, a mooring equipped with an acoustic modem transmitting dummy data messages will be deployed in the vicinity of the UUV.

2.2 Relevant previous or future research projects:
Previous unmanned undersea vehicle research (UUV) research has focused on undersea vehicles that were mobile and operated in shallow water. This experiment exercises a vehicle that will remain stationary and operate at very deep depths. Future research applications include deep ocean acoustic tomography and in-situ environment sensing.

2.3 Previous publications relating to the project:
There is no previously published research data relating to the project.

## 3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude, including coordinates of cruise track/ way points):
Research will be conducted within 40.0km of 32.0N / 64.0W

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical areas of the intended work and, as far as practicable, the location and depth of sampling stations, the tracks of survey lines, and the locations of installations and equipment.
Chart provided - see Section 10.1.

## 4. Methods and Means to be Used

4.1 Particulars of vessel:	
Name:	SCARLETT ISABELLA
Type/Class:	Ship

Nationality (Flag state):	United States
Identification Number (IMO/Lloyds No.):	
Owner:	Boston Harbor Cruises Offshore Logistics
Operator:	Boston Harbor Cruises Offshore Logistics
Overall length (meters):	136.00
Maximum draught (meters):	12.60
Displacement/Gross tonnage:	98.00
Propulsion:	DIESEL
Cruising:	
Maximum speed:	
Call sign:	WDF2816
INMARSAT number and method and capability of communication (including emergency frequencies):	
Name of master:	Jeffrey Taylor
Number of crew:	6
Number of scientists on board:	14

4.2 Other craft in the project, including its use:

ANDREA A

4.3 Particulars of methods and scientific instruments:

Types of samples and measurements	Methods to be used	Instruments to be used
1. Acoustic data recorded on echo repeater and deep UUV 2. Sound velocity measurements - recorded via sound speed meter carried on deep UUV	1. Deep UUV to Towed Echo Repeater link - Deep UUV transmits waveform to Echo Repeater. Echo Repeater receives and repeats back. 2. Deep Acoustic Modem Mooring, Deep UUV telemeter acoustic data between surface station keeping buoy. Statistics regarding data quality will be measured	Deep UUV, Towed Echo Repeater, Deep Acoustic Modem Mooring, Station Keeping Buoy

4.4 Indicate nature and quantity of substances to be released into the marine environment:

No

4.5 Indicate whether drilling will be carried out. If yes, please specify:

No

4.6 Indicate whether explosives will be used. If yes, please specify type and trade name, chemical content, depth of trade class and stowage, size, depth of detonation, frequency of detonation, and position in latitude and longitude:

No

4.7 Indicate whether protected species be studied. If yes, please specify:

No

## 5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and anticipated timeframe for recovery, locations and depth, and measurements):

yes

1. Deep UUV - deploy and recover daily from 2/18/14 - 3/4/14 in vicinity of 32.0N / 64.0W. Operates 3500 - 4500m depth. 2. Towed echo repeater - deploy between 50-100m depth. Tow in vicinity of 32.0N/64.0W. 3. Station Keeping Buoy - deploy 18-20 Feb in vicinity of 32.0N / 64.0W. Operates on surface. Recover 3/5/14 - 3/7/14. 4. Acoustic Modem Mooring - deploy 18-20 Feb in vicinity of 32.0N / 64.0W. Subsurface mooring, positioned at 4000m depth. Recover 3/5/14 - 3/7/14.

## 6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:

Project Start Date: Feb 14, 2014

Project End Date: Mar 07, 2014

6.2 Coastal State-specific details:

Coastal Area	Estimated Entry Date	Estimated Departure Date
<b>Bermuda</b>	Feb 17, 2014	Mar 04, 2014
<b>Explanation of multiple entries:</b> Multiple port calls in St. George's: 1. 2/17-2/19 2. 2/23 - 2/24 3. 3/2 - 3/4 - May require additional or extended port calls for bad weather		
<b>Research will be performed:</b> between 12-200 nm		
<b>Extent to which Bermuda will be enabled to participate or to be represented in the research project:</b>		

Experiment is an engineering trial to test functionality of instruments. There is little opportunity for additional participants.

**Name, affiliation and contact information for all participants from coastal state Bermuda:**

#### 7. Port Calls

Port	Arrival Date	End Date	Special Logistical Requirements	Shipping Agent
St Georges	2/17/2014	2/19/2014	None	Peabody & Lane Corp. 8 Essex Center Drive Peabody, MA 01960 978-532-3712
St Georges	2/23/2014	2/24/2014	None	Peabody & Lane Corp. 8 Essex Center Drive Peabody, MA 01960 978-532-3712
St Georges	3/2/2014	3/4/2014	None	Peabody & Lane Corp. 8 Essex Center Drive Peabody, MA 01960 978-532-3712

#### 8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research project:

See Section 6.2.

8.2 Proposed dates and ports for embarkation/disembarkation:

See Section 6.2.

#### 9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include the expected dates of submission of the data and research results:

No more than 60 days from the end date of the research as provided in Section 6.1.

9.2 Anticipated dates of submission to the coastal State of the final report:

No more than 2 years from the end date of the research as provided in Section 6.1.

9.3 Proposed means for access by coastal State to data (including format) and samples:

Data will be provided through official channels at no cost to the coastal State(s). Samples will be provided upon request.

9.4 Proposed means to provide coastal State with assessment of data, samples and research results:

Assessment of data, samples and research results will be provided at no cost to the coastal State(s).

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples and research results:

Assistance in further assessment or interpretation will be provided upon request.

9.6 Proposed means of making results internationally available:

There is no plan to make the results of this cruise internationally available.

#### 10. List of Supporting Documentation

10.1 List of attachments, such as additional forms required by the coastal State, etc.:

Attachment Type	Description	Attachment	Submission Date
Supplemental Material	Information on second vessel, ANDREA A	7939843750_ANDREA A Information.docx	Jan 27, 2014
Proposed Cruise Track	Proposed cruise track in .xls format with geoplots overview	5006875000_DASH_ST8LA_cruise_track.xlsx	Jan 28, 2014