PMC-EF2a
(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: Lockheed Martin **STATE:** VA

PROJECT TITLE : OTEC Cold Water Pipe-Platform Subsystem Dynamic Interaction Validation

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000293	DE-EE0003637	GFO-0003637-001	0

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

B3.6 Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).

Rational for determination:

Lockheed Martin (LMCO) in Manassas, Virginia, is proposing to use DOE funding to validate the ability to numerically model the dynamic interaction between a large (10 meter diameter) cold water-filled pipe (CWP) and a floating ocean thermal energy conversion (OTEC) platform, excited by a meteorological and ocean (metocean) weather conditions. The numerical model would greatly reduce deployment risk and add to design surety for floating ocean thermal conversion platforms of this magnitude. Measurements would be validated using a scale model tested in one of the three deepwater offshore basin test facilities selected.

The proposed project involves information gathering and indoor bench-scale research and laboratory operations. Choosing a deepwater offshore basin test facility is part of the DOE bid process. LMCO has submitted three Laboratory R&D Questionnaires for each deepwater offshore basin test facility: MARIN in The Netherlands, State Key Laboratory of Ocean Engineering at the Shanghai Jiao Tong University in China and LabOcean at the University of Rio de Janeiro, Brazil.

The Maritime Research Institute Netherlands (MARIN) is located at 2, Haagsteeg
6708 PM Wageningen, The Netherlands. All labor related actions follow the ISO 9001 standard. See attached ISO document DOC 3-4-1-04 ISO certificaat eng + ned, DOC 5-6-1-01 Health, Safety Policy rev2 , DOC 5-1-1-05 Environmental protection policy statement and Safety records MARIN, and Review Netherlands Government Legislation on HSE rev2. To handle, store and dispose of hazardous waste, MARIN follows the Dutch legislation (EEG legislation) PGS15 Regulation. Although none are anticipated, permitting would depend on the type of test that would be run.

The State Key Laboratory of Ocean Engineering at the Shanghai Jiao Tong University is located at 800 Dong Chuan Road, Min Hang District, Shanghai, China, 200240. The safety protocols at this laboratory are made and monitored by the Department of Laboratory and Facility of Shanghai Jiao Tong University. The protocols are subject to the Production and Safety Laws of People's Republic of China. Protocols include Personal Protective Equipment and Clothing Directive, Operation Procedures of Instruments and Facilities, Fire Safety Management and Health, Safety and Environment Management System. According to the University, no permits would be needed for the deepwater offshore model test.

The Ocean Technology Laboratory (LabOceano) is located at the main campus of the Federal University of Rio de Janeiro (UFRJ), and is part of the Ocean Engineering Department of COPPE/UFRJ. The campus is located at Ilha do Fundao, in the northern part of the city of Rio de Janeiro, state of Rio de Janeiro, Brazil. The activities and safety protocols performed by LabOceano are subject to the following standards: Regulatory Norms (NR) of the Brazilian

Ministry of Labour and Employment (MTE), Regulatory Norms of the Brazilian Association of Technical Standards (ABNT NBR) and International Standards Regulatory Norms of the Brazilian Association of Technical Standards (ABNT NBR). LabOceano's activities do not involve production of gases or heavy metals. No permits are anticipated for the proposed projects scope of work at the deepwater offshore basin facility.

Conventional offshore industry methods use numerical models, validated by scale model tests in facilities able to replicate real at-sea metocean conditions. Because the size of LMCO's pipe (10 meters in diameter) is ten times greater than conventional marine risers, real at-sea metocean conditions have not yet been numerically modeled. A commercial OTEC plant would require a 10 meter diameter cold water pipe to be suspended to a depth of 1,000 meters.

LMCO has been developing a fiber-reinforced plastic (FRP) pipe, which could be manufactured vertically from the floating platform. Tests on fiberglass fatigue in seawater indicate that fatigue life is sensitive to the dynamic strain amplitudes. Application of existing numerical modeling methods to analyze the OTEC system would be validated to minimize the risk to a pipe in the first at-sea pilot plant and in subsequent commercial plants. Results and measurements from the deepwater offshore basin test would be compared to and incorporated into the existing numerical modeling tools to improve accuracy and confidence in the model results.

In view of the information provided by the State and the recipient, DOE has determined that the impacts related to the proposed project are anticipated to have negligible affects on the human and natural environment. The proposed project is consistent with actions outlined in A9 (information gathering) and B3.6 (indoor bench-scale and research and conventional laboratory operations).

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

EF2a prepared by Cristina Tyler on 12/9/2010.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 12/14/10

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.

☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager