OTEC Technology Workshop

Welcome

Logistics

- Fire Exits
- Restrooms on this level
- Map of conference center in packets – location of breakout rooms
- Dining – breakfasts & snacks (outside meeting rooms)
- Lunch:
  - Hot/Cold Buffet
  - Dining Room (on this level)
  - Reserved seating
- Evening Dinner:
  - Shuttle – pick up outside New England Center at 6:30 pm
  - Mahalos Catering at The Pearl in downtown Portsmouth
  - Cash bar available (beer and wine)
  - If you have any questions – check with staff at registration table

KEY CRRC STAFF

- Nancy Kinner – UNH Co-Director
- Kathy Mandsager – Program Coordinator
- Joseph Cunningham – Research Engineer
- Zachary Magdol – Engineer

CENTER CREATION

- NOAA's Office of Response and Restoration (ORR)/UNH spill partnership in 2004
- Co-Directors:
  - UNH – Nancy Kinner
  - NOAA – Amy Merten
- Funding for oil spill research decreasing
  - Government
  - Private sector
- Many research needs exist regarding spill response, recovery and restoration

OVERALL MISSION

- Develop new approaches to response and restoration through research/synthesis of information
- Serve as a resource for ORR, NOAA and other agencies
- Serve as a hub for spill research, development and technical transfer for ALL stakeholders
  - Spill community (U.S and internationally)

SPECIFIC CENTER MISSIONS

- Conduct and oversee basic and applied research and outreach on spill response and restoration
- Transform research results into practice
- Encourage strategic partnerships to achieve mission
- Conduct outreach to improve preparedness and response
- Create an educational program for new approaches to spill response and restoration
  - Educate/train students who will pursue careers in spill response and restoration
  - Internships with agencies, laboratories

OUTREACH EFFORTS

- **Workshops on hot topics to identify research priorities and partners**
  - **Dispersed Oil: Efficacy and Effects**
  - **Submerged Oil: State of the Practice**
  - **Human Dimensions of Spills**
  - **Dispersed Oil Research Forum**
  - **Integrated Modeling**
  - **PAH Toxicity**
  - **Environmental Response Management Application (ERMA™)**
  - **Environmental Response Data Standards**
  - **HEA Metrics Workshop**
  - **Opening the Arctic Seas: Envisioning Disasters & Framing Solutions**

BACKGROUND/ GOALS/OUTCOMES

CRRC/OCRM PARTNERSHIP

- NOAA's Office of Ocean and Coastal Resource Management (OCRM) licensing of OTEC
- OCRM Director David Kennedy on CRRC Advisory Board
- OCRM Senior Policy Analyst David Kaiser affiliated with CRRC at UNH
- CRRC experience hosting workshops

OTEC WORKSHOP

- CRRC hosting two OTEC workshops for OCRM
  - November, 2009: Technical Aspects
  - 2010: Environmental Impacts and Risks
- Format: Plenary Sessions and Breakout Groups
- Participants representing a spectrum of industry, public sector, academia, and NGOs
  - OTEC experts
  - Related experts
    - e.g., platforms, power cable, mooring

KEY CONCEPT

- **Bring diverse expertise and perspectives to the table**
- **Dialogue on:**
  - **Where we are?**
  - **Where do we want to be?**
  - **How do we get there?**

OVERALL GOAL

To Understand Technical Readiness of Commercial Scale OTEC System

SPECIFIC FOCI

- State-of-the-art of OTEC Technology
- Technical feasibility
- Time frame for commercial development

Technical Components to be Discussed

- Cold Water Pipe
- Heat Exchangers
- Platform
- Platform Mooring
- Platform/Pipe Interface
- Pumps and Turbines
- Power Cable

PLENARY PANEL DISCUSSIONS

- Cycle and Auxiliary Uses
- OTEC as a System

AGENDA
TUESDAY AM

09:20	Background & Workshop Goals/Outcomes	Nancy Kinner
09:30	OTEC Timeline & Participant Introductions	Iris Ioffreda, Facilitator
10:30	Break	
10:45	Plenary Session: Setting the Stage	
A.	Cold Water Pipe	Alan Miller
B.	Heat Exchangers	Avram Bar-Cohen
C.	Platform Mooring	Frederick “Rick” Driscoll
D.	Platform/Pipe Interface	Patrick Grandelli
E.	Pumps & Turbines	Peter Pandolfini
F.	Platforms	Edward Horton
G.	Power Cable	Steiner Dale
H.	Cycle/Auxiliary Uses	C.B. Panchal
I.	Overall System & Program	Luis Vega
11:45	Workshop Structure & Logistics	Iris Ioffreda

AGENDA

TUESDAY PM

13:00	Breakout Session I	Breakout Discussion Groups
15:30	Plenary Session I: Group Reports	(10 minutes each)
17:00	Adjourn	
18:30	Shuttle to Dinner	Portsmouth

AGENDA

WEDNESDAY AM

09:00 Overview and Review/Recalibrate: Iris Ioffreda

09:15 Panel Discussion: Cycle and Auxiliary Uses: Today and the Future

10:15 Breakout Session II

12:15 Lunch

AGENDA

WEDNESDAY PM

12:45	Breakout Session III	Breakout Discussion Groups
15:00	Plenary Session: Group Reports	(10 minutes each)
17:00	Adjourn (Dinner on your own)	

AGENDA

THURSDAY

09:00	Overview/Review Iris Ioffreda
09:15	Panel Discussion on OTEC as a System
10:30	Break
10:45	Discussion of OTEC as a System
12:00	Lunch
13:00	Plenary Session: Synthesis and Next Steps: Iris Ioffreda
14:30	Closing Remarks: Iris Ioffreda & Organizing Committee
15:30	Adjourn

Breakout Questions for Each Component

Session I:

- What are the state-of-the-art technologies for the technical component?

Breakout Questions for Each Component

Session II:

- What processes (e.g., equipment, personnel) of the technology are associated with:
  - fabrication, deployment, construction, and installation;
  - operation and maintenance (including cleaning, repair, and replacement);
  - monitoring component performance;
  - personnel safety and emergency preparedness; and
  - decommissioning?
- What risks are associated with failure with these processes?

Breakout Questions for Each Component

Session III:

- Are the technologies associated with this component viable? What are the economic factors associated with these technologies? What are the hurdles/limiting factors associated with these technologies?

- What is the development time frame for the technologies associated with this component?

Panel Discussion Questions:
OTEC as a System

- What are the performance metrics that must be demonstrated prior to commercial development? What is the development time frame (e.g., today, 1-2 yr, 5-10 yr) for a commercial OTEC system?
- What are the potential failures that could lead to the shutdown of an OTEC system?
- What processes/diagnostics are needed to detect, monitor and reduce these risks?
- What are the flexibilities in the OTEC system's components that could minimize environmental impacts?

Workshop Outcomes

- Report compiling information gathered at workshops (NOT recommendations)
- Report Contents:
  - Introduction
  - Workshop organization and structure
  - Information gathered
    - By component
    - As system
  - Synthesis of workshop results
  - Possible research topics
  - Appendices – (e.g., participants, slides, relevent references)

CRRC's Role as Workshop Host

- CRRC is a Neutral Party
  - No oil or OTEC in NH waters
- Expertise - engineering and scientific based discussion
- Academy is safe place to have frank and open discussion
- Academia approach garners public trust
  - Peer review approach
- CRRC brings all parties to table

Coastal Response Research Center

www.crrc.unh.edu

PARTICIPANT INTRODUCTIONS

- **Name**
- **Affiliation**
- **Technical Expertise**

Workshop Structure

INTENDED OUTCOMES

To understand technical readiness of commercial scale OTEC system

This Workshop is NOT:

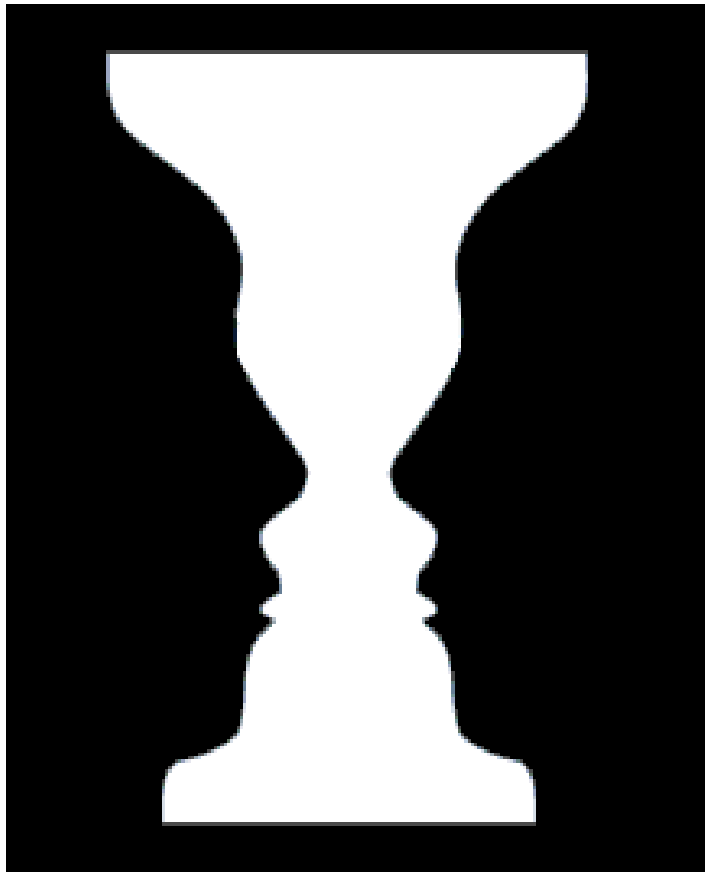
- A decision making meeting
- Looking to define one “best” technology
- Asking for disclosure of proprietary information or design specs
- Focused on environmental impacts
- Focused on regulatory challenges
- About the process to get a license for commercial OTEC

- It IS focused on technical, engineering issues!

Workshop Structure

- Mostly in small groups. Three breakout sessions per topic. Reports to large group on Monday and Tuesday afternoons.
- Small group facilitators will manage the discussion and help the group develop report outs.
- Each small group has an assigned note-taker.
- Success in the small groups will come from active participation by all, and allowing all to have a voice.
- Issues that are relevant but not within scope of this workshop will be captured on a “Parking Lot.”
- Nancy Kinner and Iris Ioffreda will be floaters.

What Do You See?



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YOUR ROLE

- What will I take away?
- What will I contribute?
- What do I need to and not do to make both those things happen?

Ground Rules

- Be fully present (which includes turn off ringtones for cell phones and blackberries)
- Honor time schedules
- Speak openly and honestly and only for yourself
- Allow everyone an opportunity to express their views
- Ask questions and listen for understanding