

Methane Hydrate Advisory Committee (MHAC) Meeting

March 27, 2014

2:00pm – 5:00pm (CDT)

&

March 28, 2014

8:30 am – 12:30 am (CDT)

Galveston, Texas

MEETING SUMMARY

Attached are the meeting agenda and the list of attendees.

Thursday, March 27, 2014

DFO Welcome and Introductions, Paula A. Gant, DFO

The meeting was called to order at 2:00pm CDT by Paula A. Gant, Deputy Assistant Secretary (DAS) for Oil and Gas within the U.S. Department of Energy (DOE) and Designated Federal Officer (DFO) for the Methane Hydrate Advisory Committee (MHAC). She thanked the members for their public service and stated that the program is of great interest and importance to DOE. Secretary Moniz is very knowledgeable about this area and understands the potential and challenges. In addition, The DAS mentioned the \$15 million budget request for FY15 and that the increase over prior years' will help us to execute our plans and move on the recommendations that are suggested.

The DFO asked the committee to consider some framing thoughts/questions:

- Congress started having more interest in research on methane hydrates in 2000 and the legislation it passed at that time established an R&D program which is research that the government should be doing
- Shale revolution has made available large quantities of natural gas
- Our ability to produce shale gas has reduced the expectations for future imports of natural gas.
- There are expectations that LNG will be exported from U.S. late next year and that the U.S. will be a net exporter by 2018
- There is no more of an impact with methane hydrate production than conventional natural gas with respect to greenhouse gases; perhaps the public perception can be changed with regard to environmental issues related to climate change.

After some brief discussion on the framing questions, Lou Capitanio moved to start committee business.

Committee Business, Lou Capitanio, Committee Manager

Lou Capitanio, the Committee Manager, outlined committee business. He informed the committee that no public comments were received in advance of the meeting nor has anyone requested to address the committee at the meeting. Mr. Capitanio made a general announcement that those committee members who are special government employees need to fill out a pack of Human Resources forms and submit them to the DAS' Special Assistant, Kate Shanahan, at the end of the meeting. In addition, he mentioned that the previous Chair, Missy Feeley, has resigned from the committee and that there was a need to elect a new chair person. Lou noted that the Vice Chair, Peter Flemings, was willing to move up to the Chair position if the committee approved. Miriam Kastner nominated Peter Flemings as Chair and it was seconded by Craig Shipp. The committee voted and by the majority, Peter Flemings was elected as the new Chair for the Methane Hydrate Advisory Committee. Miriam Kastner was then nominated as Vice-Chair by Peter Flemings. The nomination was seconded and the committee voted. By the majority, Miriam Kastner was elected as the Vice-Chair.

Presentation: Quantifying Climate-Hydrate Interactions: A Progress Report – Carolyn Ruppel, U.S. Geological Survey

Dr. Carolyn Ruppel, Chief of USGS Gas Hydrates Project, provided a presentation on climate-hydrate interactions. Dr. Ruppel reviewed the various observed and predicted methane fluxes from several arctic and marine hydrate systems. The presentation explored the true role of gas hydrate dissociation on methane in the atmosphere, and how the gas hydrate contributions could be discerned. The top-down and bottom-up approaches yield results that do not agree. Methane is a component in the global carbon cycle and it plays important roles in the global climate system. In summary, Dr. Ruppel noted that there is a substantial contrast between top-down and bottom-up estimates of atmospheric methane sources/sinks and that gas hydrates may play a role in this disparity. Dr. Ruppel concluded that based on current conditions and data, hydrate was not likely to be a major player in near-term climate change. Dr. Ruppel's presentation can be found on the Committee website at <http://energy.gov/fe/services/advisory-committees/methane-hydrate-advisory-committee>

Presentation: Gas Hydrates as a Geohazard: What Really Are the Issues? – R. Craig Shipp, Shell International E&P, Inc.

Dr. Craig Shipp of Shell International Exploration and Production, Inc., and a member of the Advisory Committee, presented on gas hydrate geohazard issues. Dr. Shipp reviewed the historical evolution of gas hydrate as a geohazard, potential operational geohazards related to gas hydrate, and potential naturally-occurring geohazards related to gas hydrate. Dr. Shipp noted that understanding of the potential geohazards issues for gas hydrate were slow to evolve, because most experience was limited, anecdotal, and frequently proprietary information within energy companies. He noted that the definition of what actually is a gas hydrate geohazard is interpretative - one of scale in size and time. Operational Geohazards are latent natural hazards triggered by human activities that are of short duration, occur locally (i.e., the wellbore), and are more restricted in scope. Naturally Occurring Geohazards are caused by geologic process that go on for a long time, can occur over wide area, and are bigger in scope. In summary, Dr. Shipp concluded that:

- Drilling of gas hydrate is a manageable, but potentially expensive issue.
- Substantial information exists about the drilling of gas hydrate intervals, but much of this experience still is anecdotal and/or proprietary.
- There is a common, inappropriate linkage between catastrophic marine processes and the geohazard issues concerning producing gas-hydrate reservoirs.
- In part, we can use this increasing abundant information from industry drilling through gas hydrate and experience from scientific drilling targeting gas hydrate to frame the potential geohazards associated with producing gas-hydrate reservoirs.
- A rapid increase in understanding of potential geohazards of gas-hydrate reservoirs will occur over the next few years as the number of gas-hydrate production tests increases.

Dr. Shipp's presentation can be found on the Committee website at <http://energy.gov/fe/services/advisory-committees/methane-hydrate-advisory-committee>

DFO Summary and Guidance, Paula A. Gant, DFO

DFO Paula Gant provided some thoughts and direction for tomorrow's committee discussion. DFO Gant noted that we are firmly on the path for the Program as set forth by prior committee recommendations. The DFO encouraged a continuation of the collaborative effort among all Federal agencies performing methane hydrate research. In regards to the current budget, she mentioned that Secretary Moniz is a leader that is very committed to the methane hydrate program and that DOE believes that we have requested a logical budget. The DFO feels very encouraged that the partnership with Alaska will significantly help with field work, an

important objective of the program. Once the DFO finished speaking, the floor was open for the committee and two questions were raised and the DFO responses follow:

1. How can the Committee accelerate the process in regards to communicating with the Secretary?
 - The next 3-4 months is a good time to make recommendations to the Secretary as that is the period in which DOE will be formulating its FY 2016 budget request. It particular, it would be good to submit a letter and back it up with a couple of pages of background/benefits.
2. How can the committee better communicate results of research?
 - We have to continue to communicate what we hope to learn, and all of the benefits of, field testing; and make sure that the information gets to the public
 - One way may be through a public statement from the Committee which may or may not follow the interagency Roadmap.

Finally, DFO Gant advised the Committee that she would not be able to be present for the meeting on March 28 and that Lou Capitanio has been designated as the acting DFO for that portion of the meeting.

Presentation: International Gas Hydrate Research – Tim Collett, U.S. Geological Survey

Dr. Tim Collett of USGS presented on international gas hydrate research. Dr. Collett provided an overview of all international gas hydrate field projects, including the MH21 program in Japan, the UBGH1 and UBGH2 expeditions in Korea, the GMGS1 and GMGS2 expeditions in China, NGHP01 expedition in India, and the arctic permafrost gas hydrate testing, including the Mallik project and the recent ConocoPhillips-operated Ignik Sikumi test. He noted that there is strong international interest in an extended duration test on the Alaska North Slope. These projects were all examples of collaborative efforts between government and industry. In addition to these international programs, Dr. Collett provided a brief overview of international gas hydrate R&D activities being conducted worldwide, including the programs of Norway, Canada, New Zealand, Germany, and others.

Lastly, Dr. Collett reviewed the recommendations made by the Consortium for Ocean Leadership's recently published "Marine Methane Hydrate Field Research Plan." The top priorities for drilling programs are (1) an expedition designed to further our understanding of the highly concentrated sand-rich methane hydrate reservoirs in the Gulf of Mexico and (2) a drilling program designed to characterize the hydrate systems along the Atlantic margin. Dr. Collett's presentation can be found on the Committee website at <http://energy.gov/fe/services/advisory-committees/methane-hydrate-advisory-committee>

Friday, March 28, 2014

Presentation: DOE's Natural Gas Hydrates Program – Ray Boswell, NETL

Dr. Ray Boswell began his presentation with an overview of historic DOE Gas Hydrate Funding. While appropriations have been reduced and variable in recent years as compared to the funding from 2000 to 2009, the Administration's budget request for FY 2015 is for \$15 million

Dr. Boswell noted that the federal role in gas hydrate science and technology development is widely accepted. In fact, the general consensus is that the DOE has managed the effort well. The following primary goals and next steps are clear and the groundwork is well laid out:

- Monitored production tests (Alaska first, then marine)
- Sampling/analysis of marine occurrences
- Resource confirmation in other US OCS areas
- Refinement/field calibration of exploration technologies
- Integration of GH science into climate change models

Lab and modeling working is needed as support, but the big answers will come from the field. The field work required is complex and costly. In addition, the industry/international perspectives change rapidly; at present, several of the program's historic industry collaborators have recently become more disinclined to lead further projects.

In regards to production technology, Dr. Boswell noted that, to date only short-duration scientific field experiments have been done. Production response via thermal technologies (Mallik, 2002); exchange technology (Ignik Sikumi, 2012); and depressurization (Mallik 2007, 2008; Nankai, 2013) have been demonstrated in field tests and simulation. A long-term depressurization test is the next priority in production technologies. Dr. Boswell stated that in 2013 the Alaska Department of Natural Resources (ADNR) set aside State lands on the Alaska North Slope for analysis. These lands could provide an opportunity for a long-term scientific test, but these lands lack infrastructure. There is some urgency with respect to these lands since the period of access allowed by the ADNR is not open-ended.

Dr. Boswell reviewed the ongoing projects in the DOE Program. This included work with the USGS, the National Labs, and the projects funded through the FY 2012 and FY 2013 Funding Opportunity Announcements (FOA). The plans for marine gas hydrate characterization were presented. The next opportunities for marine gas hydrate characterization include an East Coast LWD Exploration and a core sample acquisition/analysis from confirmed GOM reservoirs or further exploration in the GOM. Dr. Boswell noted that one implication of the expanding access to field data is the ability to add geologic detail to reservoir models. In the early 2000s, production modeling indicated there were low rates, long lag times, large cumulative recovery, but very long production profiles. Today, models indicate that recoverability is theoretically high (60-85%) with minimal lag times and short production profiles.

Finally, Dr. Boswell discussed the various Interagency Methane Hydrate Roadmaps that have been developed. The 2009 and the 2013 versions have not been published. Dr. Boswell's presentation can be found on the Committee website at <http://energy.gov/fe/services/advisory-committees/methane-hydrate-advisory-committee>

Committee Discussion

Dr. Peter Flemings, newly elected Chair of the Committee led the discussion. Responsibilities of the committee:

1. Provide external oversight of the Methane Hydrate Program
2. Make recommendations on how the Program can be improved
 - The committee needs to ascertain the value of the program and what it needs to do.
 - Communicate to the Secretary of Energy what are the most appropriate items to which DOE funding can be applied.

While a meeting with the Secretary would be ideal, the Committee believes that at minimum a letter to the Secretary is necessary to convey its recommendations and to elicit feedback. The Committee discussed the letter in detail and suggested that the letter to the Secretary needs to consist of several points, including:

- Acknowledge the importance of methane hydrate research
- Indicate that the Committee would like to meet with the Secretary and why they want to meet with him
- Explain the priorities of the meeting and what is to be discussed
- Possibly pull pieces from the 2013 Roadmap for reference/inclusion

The Committee discussed several possible approaches for the format of the letter:

1. A one and a half page letter and copy the Assistant Secretary for Fossil Energy and Under Secretary for Science and Energy with the hope of making the letter more relevant.
2. Letter with additional information as an attachment. There was much discussion on this approach as some of the committee members did not feel that excessive information need be included.

3. With the letter and memo, have a sheet of key facts included. Have five main points/priorities in a brief memo and attach a three-page letter
4. A one page letter with one appendix – similar to option 2, but shorter attachment.

Ultimately, the Committee decided to form a subcommittee to prepare the letter of recommendations to the Secretary and the background information to accompany the letter. The Committee decided that the letter should be finalized by May in order to be available to DOE during the FY 2016 budget formulation process. The writing Subcommittee is comprised of Peter Flemings, Miriam Kastner, Mark Myers, Matt Hornbach, and Richard Charter.

Finally, Dr. Flemings recapped the action items for DOE and the Committee as follows:

1. DOE should distribute to the Committee the most recent draft Interagency Roadmap; as well as earlier versions of the 2013 Roadmap.
2. The Subcommittee will draft a letter to the Secretary which will be completed by May 9, 2014.
3. Next Committee meeting will be via teleconference in early May in order to discuss the letter and vote on its form and contents.
4. Once the letter is transmitted to the Secretary, Lou Capitanio will attempt to set up a meeting with the committee representatives through the DOE meeting request process.

The meeting adjourned at 11:37am CDT.


Peter Flemings, Chair


Paula A. Gant, DFO

Table 1: List of Attendees

MHAC Meeting March 27-28 List of Attendees			
Attendee	Role	March 27	March 28
Dr. Thomas Blasingame Texas A&M University Department of Petroleum Engineering	Committee Member	X	X via telephone
Mr. Richard Charter Co-Chair, National OCS Coalition Resources Legacy Fund Foundation	Committee Member	X	X
Mr. Robert Swenson Deputy Commissioner Alaska Department of Natural Resources	Committee Member	X	X
Dr. Peter Flemings Bureau of Economic Geology The University of Texas at Austin	Committee Member	X	X
Dr. David Goldberg Lamont Doherty Earth Observatory Marine Geology and Geophysics Department	Committee Member	X	X
Dr. Miriam Kastner Professor Scripps Institute of Oceanography University of California, San Diego	Committee Member	X	X
Dr. Carolyn Koh Colorado School of Mines Chemical Engineering Department	Committee Member	X	X
Dr. Craig Shipp Geohazards Assessment and Pore Pressure Prediction Team Shell International Exploration and Production Inc.	Committee Member	X	X
Dr. Mark D. Myers Vice Chancellor for Research University of Alaska Fairbanks	Committee Member	X	X
Dr. Michael Max Chief of Research Hydrate Energy International, Inc.	Committee Member	X	X
Dr. Matthew J. Hornbach Southern Methodist University Huffington Department of Earth Sciences	Committee Member	X	X

Dr. Robert Harris College of Earth, Oceanic, & Atmospheric Sciences Oregon State University	Committee Member	X	X
Ms. Sarah M. Forbes Senior Associate World Resources Institute	Committee Member	X	X
Dr. George J. Moridis Head, Hydrocarbon Resources Program Lawrence Berkeley National Lab University of California, Earth Sciences Division,	Committee Member	X	X
Paula A. Gant Deputy Assistant Secretary for Oil and Gas U.S. Department of Energy	DFO	X	
Lou Capitanio Committee Manager U.S. Department of Energy	DOE Staff	X	X
Kate Shanahan IBM	DOE Support	X	X
Ray Boswell NETL	Speaker	X	X
Carolyn Ruppel USGS	Speaker	X	
Tim Collett USGS	Speaker	X	
Kiyofumi Suzuki Japan Oil, Gas, and Metals National Corporation	Other		X
Greg Myers Consortium for Ocean Leadership	Other	X	

Methane Hydrate Advisory Committee Meeting

March 27, 2014 2:00pm – 5:00pm (CDT)

March 28, 2014 8:30am – 12:30pm (CDT)

Public Access

The Hotel Galvez & Spa
East Parlor Room
2024 Seawall Blvd.
Galveston, TX 77550

March 28 Call-in Number: (409) 765-7721 – ask to be transferred to the East Parlor Room

AGENDA

March 27, 2014 2:00pm – 5:00pm (CDT)

Time	Discussion Item	Speaker	
1:30 pm – 2:00 pm	Registration		All
2:00 pm – 2:20 pm	DFO Welcome and Introductions	Paula Gant, DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)	
2:20 pm – 2:40 pm	Committee Business – election of Committee Chair	Lou Capitanio, Program Manager Methane Hydrate Program	
2:40 pm – 3:00 pm	Gas Hydrate Resource – Part 1	Ray Boswell, Technology Manager, Methane Hydrates National Energy Technology Laboratory (NETL)	
3:00 pm – 3:30 pm	Climate -Sensitive Gas Hydrates and the Environment	Carolyn Ruppel, U.S. Geological Survey	
3:30 pm – 3:45 pm	Break		All
3:45 pm – 4:15 pm	Gas Hydrates Geohazards: Natural Hazards and Risks	Craig Shipp, Shell International E&P, Inc.	
4:15 pm – 4:45 pm	Update on International Activities	Tim Collett, Research Geologist, U.S. Geological Survey	
4:45 pm – 5:00 pm	Strategic Direction - DOE's goals and how the near term program fits into the longer term strategy; budget appropriations	Paula Gant, DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)	
5:00pm	Adjourn		

AGENDA
March 28, 2014 8:30am – 12:30pm (CDT)

Time	Discussion Item	Speaker
8:15 am – 8:30 am	Registration	All
8:30 am – 8:45 am	Gas Hydrate Resource – Part 2	Ray Boswell, Technology Manager, Methane Hydrates National Energy Technology Laboratory (NETL)
8:45 am – 10:00 am	FY 2013 FOA research initiatives FY 2014 Program Activities Alaska Update Interagency Roadmap Revisited	Ray Boswell, Technology Manager, Methane Hydrates National Energy Technology Laboratory (NETL)
10:00 am – 10:15 am	Break	All
10:15 am – 12:15 pm	Committee Discussion	Methane Hydrate Advisory Committee
12:15 pm – 12:30pm	Public comments, if any	Paula Gant, DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)
12:30 pm	Adjourn	