

Methane Hydrate Advisory Committee (MHAC) Meeting

March 1-2, 2018

Hotel Galvez

Galveston, TX

MEETING SUMMARY

Attached are the meeting agenda and the list of attendees; a quorum of Committee members were present.

Welcome and Introductions

The meeting was called to order on March 1, 2018 at 2:00 pm CST by Robert J. Smith, Acting 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). DFO Smith thanked to the Committee members for their continued commitment to the MHAC and commenced the meeting with introduction of each Committee member, both reappointed and new members, along with DOE staff, presenters, and other attendees.

DFO Smith conveyed to the Committee that the President's budget supports the gas hydrates program, although not at the levels that the Committee has recommended in the past. DFO Smith thanked the Committee members that traveled to DOE-HQ in DC to meet with Mr. Steve Winberg, Assistant Secretary for Fossil Energy, on January 10. DFO Smith stated that Mr. Winberg also supports the hydrates program and recognizes the importance of gas hydrates research.

DFO Smith stated that the Department's primary objectives going forward are conducting field work to establish the resource potential of methane hydrates via a sustained, long-term flow test on the Alaska North Slope and the 2020 coring expedition in the Gulf of Mexico. In addition to these two major field projects, the Program continues its participation in international partnerships in order to advance our understanding of methane hydrate in natural settings, and techniques for its evaluation and production.

DFO Smith stated that one of the main purposes of this meeting was to address the Secretary's memorandum directing all Federal Advisory Committees (FAC) to review DOE regulations. The Secretary directed each FAC to consider regulatory reform and to provide appropriate advice and recommendations on how DOE regulations, guidance or policies can be improved, streamlined or eliminated.

DFO Smith then turned over the meeting to Lou Capitanio to conduct committee business.

Committee Business, Lou Capitanio, Committee Manager

Lou Capitanio conducted committee business and made announcements. He reminded the group that all federal advisory committees are open to the public and deliberations must be done openly and transparently; and that minutes will be published 2-3 weeks on the Committee website. He further 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. He then confirmed that a quorum of committee members were present.

Mr. Capitanio welcomed new and reappointed committee members and explained that elections were required for the Chair and Vice-Chair positions. Mr. Capitanio asked for nominations. The committee members nominated the current Chair Dr. Carolyn Koh and Vice-Chair Dr. Miriam Kastner for reelection; both were willing to continue serving in those positions. The committee members proceeded to vote and Dr. Koh and Dr. Kastner were unanimously re-elected for MHAC Chair and Vice-Chair of the Committee, respectively.

Mr. Capitanio queried the Committee for recommendations of potential new appointee that represents the viewpoint of the environmental community and asked to send nominees to him via email. Finally, he noted that there were changes to the agenda and Ms. Carolyn Ruppel, Chief, Gas Hydrates Project U.S. Geological Survey, will be the initial presenter.

Gas Hydrates Dissociation and Interaction with the Ocean and Atmosphere – Carolyn Ruppel, U.S. Geological Survey

Dr. Carolyn Ruppel, Chief, Gas Hydrates Project, U.S. Geological Survey (USGS), presented on the interactions of gas hydrates with the environment update and assessment. Dr. Ruppel discussed the USGS gas hydrate dissociation study results published in early 2017 and its conclusion that amount of gas from the dissociation of hydrates that does make it to the atmosphere is negligible compared to other sources. Dr. Ruppel provided a chronological overview of R&D climate research projects from 2003 to the present. The research has related to: gas hydrates impacts on the climate; constraining the components of methane cycle; gas hydrates and susceptibility to environmental changes; climate-hydrate on interglacial scale; Arctic continental shelf with subsea permafrost; U.S. Atlantic Margin; 3D thermal modeling; gas sourcing; and large scale numerical modeling.

Noting the conclusions from the USGS recent studies as well as other published reports, Dr. Ruppel asked the Committee members whether they thought the Program has resolved the climate change issue, completed the federal role, and whether this area of research should be sunsetted. After much discussion the Committee concluded not to sunset the climate research, but recommended that a thorough review of this and other issues and challenges be conducted during the next Committee meeting.

Gulf of Mexico Gas Hydrates Resource Characterization – Peter Flemings, University of Texas at Austin

Dr. Peter Flemings presented a review of the Gulf of Mexico (GOM) exploration and characterization project (UT-GOM2) cost-shared with DOE. Before discussing the results of the first expedition of UT-GOM2, Dr. Flemings provided an overview of the prior GOM major field projects including the 2009 'Chevron JIP' drilling which prospected for resource-grade deposits. The UT-GOM2 project's objective is to take pressure-cores at identified known sites and explore high-value new sites. Dr. Flemings provided a summary and insights from the UT-GOM2 May 2017 pressure core expedition. Dr. Flemings discussed the steps needed to prepare for the 60 day drilling expedition planned for the first quarter of CY 2020, which will include logging and pressure coring at multiple sites in the GOM.

Dr. Flemings and his associate Ms. Jamie Morrison, then presented on the regulatory challenges to scientific drilling in the offshore continental shelf. The challenges of navigating a complicated permitting process directly addresses the Secretary's charge (specific agency actions that should be altered or eliminated) related to regulatory reform. Dr. Flemings noted that there is no obvious DOE regulatory limitation that is a critical path item. There are regulations for drilling on the outer continental shelf that might be considered for modification that would reduce the burden for conducting research activities. Most are under the Department of Interior (e.g. BSEE and BOEM) and involve interaction with EPA and US Coast Guard. Flemings emphasized that the University of Texas had no previous experience or infrastructure in permitting wells for deepwater drilling. As a result, the permitting process required to conduct the May 2017 GOM expedition often felt laborious, frustrating, and time-consuming. However, Dr. Flemings praised the Staff at BSEE and BOEM for their efforts to make the permitting a success. Challenges with permitting for the 2020 marine test were discussed with the Committee. Opportunities were identified to streamline regulations required for a research vessel that would reduce the burden on the research community.

Dr. Flemings' presentations can be found on the Committee website at <https://www.energy.gov/fe/downloads/presentations-march-1-2-2018-advisory-committee-meeting>

Update on International Activities – Timothy S. Collett, U.S. Geological Survey

Dr. Timothy Collett presented the status of international gas hydrate projects. Dr. Collett provided a timeline of research and a brief overview of international gas hydrates scientific and industry drilling activities being conducted, including programs from Japan, Korea, India, Canada, and China, noting completed and planned work.

Dr. Collett's presentation can be found on the Committee website at <https://www.energy.gov/fe/downloads/presentations-march-1-2-2018-advisory-committee-meeting>

Report of Committee Representatives January 10 Meeting with DOE Assistant Secretary for Fossil Energy Steve Winberg – Carolyn Koh, Methane Hydrates Advisory Committee

Dr. Carolyn Koh, Committee Chair, briefed the Committee on the MHAC's January 10 meeting with DOE Assistant Secretary for Fossil Energy Steve Winberg. Dr. Koh noted that ASFE Winberg was very interested, congenial, and the discussion was interactive. The meeting with Mr. Winberg covered a brief introduction of the MHAC and worldwide gas hydrates resource estimates. International spending on gas hydrates research was reviewed. Dr. Koh presented the main discussions points with Mr. Winberg regarding the U.S. being recognized as a leader in gas hydrate science and technology research. Dr. Koh noted that at historical funding levels we will not maintain this position. Dr. Koh presented the 2017 MHAC Recommendations to the Secretary and key take away messages. Key questions/comments from the meeting were presented to the Committee.

Dr. Koh provided a response to Mr. Winberg question on whether the U.S. should be a leader or fast-follower with primary points being:

- Currently, the U.S. leads in gas hydrate science; field leadership lies with those countries who have the funding – such as Japan, India, and China.

- To reassert leadership in both science and technology DOE will require substantial budget increases (at levels consistent with the original Methane Hydrate Development Act Authorization and with prior MHAC recommendations)
- To be an effective fast-follower DOE needs to make consistent and modest investments (at the level of recent Appropriations)

Dr. Koh's presentation can be found on the Committee website at

<https://www.energy.gov/fe/downloads/presentations-march-1-2-2018-advisory-committee-meeting>

Alaska Project Update/Report on Interagency Technical Coordinating Team Meeting – Ray Boswell, NETL

Dr. Ray Boswell presented a review of the gas hydrates R&D in Alaska. Dr. Boswell began with a brief overview of Alaska testing and a historical summary of prior field programs, which were conducted in partnership with industry and academia including Mt. Elbert (2007) and Ignik Sikumi (2011-2012). Dr. Boswell illustrated the Alaska North Slope (ANS) gas hydrates most promising accumulation located in the westend of the Prudhoe Bay Unit (PBU).

The DOE/Alaska DNR Memorandum of Understanding (2013) was reviewed in which the Alaska DNR withdrew state lands adjacent to the greater Prudhoe Bay production area from oil and gas leasing in order to study them for gas hydrate potential. Analysis of the lands were conducted by DOE, JOGMEC, Alaska DNR, and USGS. Dr. Boswell reviewed the potential testing sites on Alaska unleased lands but there were several issues associated with these lands, such as: high logistics cost (roads, pads); high operational risk (lack of infrastructure); uncertain regulatory environment; high geologic risk; and the need to identify an operator. For these reasons, an acceptable location to conduct a long-term reservoir response experiment could not be identified on the withdrawn state lands.

Dr. Boswell provided a review of the sites within the greater Prudhoe Bay area. Dr. Boswell provided a summary of the project design and discussion from the February 2018 Alaska project technical meeting in Denver, which included planning for a potential three-well scientific field program that included a stratigraphic test well, a geo-data well, and a production testing well. The discussion included refinement of the data acquisition (log/core/monitoring) plan, the Strat test well "success" criteria, potential well testing plans, and potential failure modes and mitigation strategies. Pressure coring is planned only for the geo-data well; several members of the Committee suggested pressure coring all three wells. Dr. Boswell also provided the projects' challenges to achieve the long-term gas hydrates test within the active oil and gas Units.

Dr. Boswell provided a brief summary of the Interagency Technical Coordination Team (TCT) meeting, which took place on February 28, 2018. Dr. Boswell discussed R&D priorities as identified by various TCT members and the regulatory reform review requested by the Secretary. The TCT provided several recommendations, both internal and external to DOE, for the Committee to consider when drafting the response to the Secretary on regulatory reform. Finally, Dr. Boswell presented the TCT's question as to what specific areas of research should be included under "environmental impacts." Following much discussion, it was decided that the Committee will address it at a subsequent meeting.

Dr. Boswell's presentation can be found on the Committee website at

<https://www.energy.gov/fe/downloads/presentations-march-1-2-2018-advisory-committee-meeting>

Committee Discussion: Drafting and Review of Committee Recommendations for the Secretary

Dr. Carolyn Koh, Committee Chair, led the discussion on the recommendations included in the response to the regulatory reform memorandum from the Secretary dated December 7, 2017 which directed all DOE Federal Advisory Committees to review DOE regulations. Given the significant amount of expertise possessed by DOE's Advisory Committees and their members, and the President's direction to reduce regulatory burdens, the Secretary directed each committee to consider regulatory reform and to provide appropriate advice and recommendations on how DOE regulations, guidance or policies can be improved, streamlined or eliminated.

The discussion was focused on the key recommendations the Committee wanted to bring to the Secretary's attention. Although the DOE regulations and policies do not adversely affect the DOE Methane Hydrate Research Program, the MHAC observed that the DOE regulations, guidance, and policies could be streamlined to better allow research organizations to manage methane hydrate field programs. The Committee provided some general recommendations for improving the efficiency and timeliness of the process for obtaining the numerous Federal permits needed for acquiring gas hydrates field research data. The permitting process involves many different agencies whose requirements, processes and timeframes for response vary greatly. However, the Committee stopped short of making any specific recommendations to DOE regarding outside agencies processes or procedures.

At the conclusion of the Committee discussion, a draft letter of Committee recommendations was completed that would be transmitted to the Secretary by Dr. Koh on behalf of the MHAC.

Next Steps

Dr. Carolyn Koh will finalize the draft regulatory reform recommendations letter and transmit to Secretary Perry on behalf of the Committee.

The Committee suggested October 2018 in Houston, TX as a possible date for the next in-person committee meeting to discuss the gas hydrates R&D program. DFO Rob Smith concurred that such a time and place would be acceptable to DOE. Topics will include defining the fundamental science areas related to the environment to be pursued by the Program.

The meeting adjourned on March 2, 2018 at 12:30pm CST.



Carolyn Koh, Chair



Robert J. Smith, DFO

January 29, 2018

Methane Hydrate Advisory Committee Meeting

March 1, 2018 2:00pm – 5:00pm (CST)

March 2, 2018 8:30am – 12:30pm (CST)

Public Access

The Hotel Galvez & Spa

Navigation Room

2024 Seawall Blvd.

Galveston, TX 77550

Day 1 AGENDA

March 1, 2018 2:00pm – 5:00pm (CST)

Time	Discussion Item	Speaker
1:30 pm – 2:00 pm	Registration	All
2:00 pm – 2:20 pm	DFO Welcome and Introductions	Rob Smith, Acting DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)
2:20 pm – 2:30 pm	Committee Business – election of Committee Chair	Lou Capitanio, Program Manager Methane Hydrate Program
2:30 pm – 3:15 pm	Gulf of Mexico Gas Hydrate Resource Characterization Project	Peter Flemings, University of Texas at Austin
3:15 pm – 3:30 pm	Break	All
3:30 pm – 4:00 pm	Gas Hydrate Dissociation and Interaction with the Ocean and Atmosphere	Carolyn Ruppel, Chief, Gas Hydrates Project U.S. Geological Survey
4:00 pm – 5:00 pm	Update on International Activities	Tim Collett, Research Geologist, U.S. Geological Survey
5:00pm	Adjourn	

Day 2 AGENDA

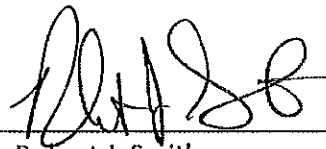
March 2, 2018 8:30am – 12:30pm (CST)

Time	Discussion Item	Speaker
8:15 am – 8:30 am	Registration	All
8:30 am – 9:00 am	Report of Committee Representatives January 10 Meeting with DOE Assistant Secretary for Fossil Energy Steve Winberg	Carolyn Koh, Chair, Methane Hydrates Advisory Committee

January 29, 2018

9:00 am – 9:30 am	<ul style="list-style-type: none">• FY 2018 Budget• Regulatory Reform	Rob Smith, Acting DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)
9:30 am – 10:30 am	<ul style="list-style-type: none">• Alaska Update• Atlantic Margin Resources• Interagency Technical Coordinating Team Report	Ray Boswell, Technology Manager, National Energy Technology Laboratory (NETL) BOEM Representative
10:30 am – 10:45 am	Break	All
10:45 am – 12:15 pm	Committee Discussion	Methane Hydrate Advisory Committee
12:15 pm – 12:30pm	Public comments, if any	Rob Smith, Acting DAS for Oil and Natural Gas, and Designated Federal Officer (DFO)
12:30 pm	Adjourn	

APPROVED:



Robert J. Smith
Designated Federal Official

2/1/2018
Date

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March 1-2, 2018

Galveston, TX

Table 1: List of Attendees

Attendee	Role	Participated March 1	Participated March 2
Dr. Thomas Blasingame Texas A&M University Department of Petroleum Engineering	Committee Member		X
Dr. Craig Shipp Geohazards Assessment and Pore Pressure Prediction Team Shell International Exploration and Production Inc.	Committee Member	X	X
Dr. Miriam Kastner 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. Michael Max Chief of Research Hydrate Energy International, Inc.	Committee Member	X	X
Dr. Joel E. Johnson University of New Hampshire Department of Earth Sciences	Committee Member	X	X
Dr. Robert L. Kleinberg Schlumberger Fellow Schlumberger-Doll Research	Committee Member	X	X
Dr. Robert D. Kaminsky Emerging Resources Advisor ExxonMobil Upstream Research Co.	Committee Member	X	X
Dr. George J. Moridis Head, Hydrocarbon Resources Program Lawrence Berkeley National Lab University of California	Committee Member	X	X
Dr. Mark D. Myers Myenergies	Committee Member	X	X

Attendee	Role	Participated March 1	Participated March 2
Mr. Daniel R. McConnell Global Product Manager- Gas Hydrates and Marine Mining, Fugro	Committee Member	X	X
Dr. John Thurmond Statoil Gulf Services LLC	Committee Member		X
Robert J. Smith Acting Deputy Assistant Secretary for Oil and Gas U.S. Department of Energy	DFO	X	X
Tim Reinhardt Director, Office of Oil and Nat. Gas U.S. Department of Energy	DOE Staff	X	X
Lou Capitanio Committee Manager U.S. Department of Energy	DOE Staff	X	X
Gabby Intihar U.S. Department of Energy	DOE Staff	X	X
Ray Boswell National Energy Technology Laboratory Pittsburgh, PA	DOE Staff	X	X
Tim Collett, Research Geologist, U.S. Geological Survey	Presenter	X	
Carolyn Ruppel, Chief, Gas Hydrates Project, U.S. Geological Survey	Presenter	X	
Peter Flemings, University of Texas at Austin	Presenter	X	
Stephen Palmes BOEM	Observer	X	
Seth Haines, U.S. Geological Survey	Observer	X	
Jaime Morrison, University of Texas at Austin	Presenter	X	