APRIL 2017 METHANE GAS DETECTION (MGD) TECHNOLOGY SOLUTIONS FORUM QUESTION & ANSWER SESSION

Question 1: There are various LFL values that you can find in different sources. However, the LFL shown on the public report is 4.4%. Which value did you choose to continue this project?

BSEE Response: A BSEE funded Technology Assessment Program (TAP) study (TAP 733) on Aviation Safety established a threshold value of 10% of the Lower Flammability Level (LFL – 4.4% by volume; thus 10% LFL is 0.44%) of methane (and associated petroleum gases)* as the safe limit for helicopter operations. Higher concentrations of methane may cause helicopter engine surge. BSEE found evidence of near identical LFL limits being used internationally (e.g., UK) and therefore proceeded with our analysis based on the 4.4% by volume value. The TAP 733 Final Report by Price-Waterhouse Coopers is available on the BSEE website www.bsee.gov.

***Note: For this and all remaining questions and answers, the word "Methane" is understood to include methane and other associated petroleum gases and that an OCS facility gas vent plume is largely methane.**

Question 2: It would be useful in explaining how BSEE determined that there is a failure in technology or how it was determined that there is a problem?

BSEE Response: National Transportation Safety Board (NTSB) investigations concluded that two helicopter incidents (2011 and 2013) resulted when methane gas was vented from a facility and ingested by the turboshaft engines of the helicopters during takeoff resulting in the ditching of both aircraft. The NTSB determined that the pilots were not informed by the platform operators of the venting of gas at the time of takeoff, indicating that the failure of gas detection technology or lack of technology contributed to the incidents.

Question 3: How confident is BSEE that methane was the primary root-cause of the ditching of helicopters in 2011 and 2013 and that "measuring technology" is the 100% solution?

BSEE Response: The National Transportation Safety Board (NTSB) reports found that methane concentration was the root cause of the 2011 and 2013 ditching. The NTSB also stated that gas detection/measurement is a possible solution to this safety issue.

Question 4: The reports from the incident are not very conclusive and none of them in fact stated that methane was the root cause, only that it could be a contributing factor. The second comment is if this is really a reflection of all facilities. We (Industry) don't see it as a big problem as you do, as many facilities follow a well-established process. Therefore, we would prefer that you made a distinction to who really this applies?

BSEE Response: The first comment was addressed in Question 2 and 3 above. For

purposes of this BAST Determination BSEE will classify facilities as either high-risk (e.g., facilities with active production; facilities with helidecks; higher flare/vent volumes) or lesser/no-risk (e.g., low production, low vent/flare, no helideck). The majority of OCS facilities will not be affected by this BAST Determination because BSEE has identified only 412 facilities (out of the 2000+ OCS facilities) as "high-risk" with the potential to be impacted by this assessment.

Question 5: How will you transmit the results from your research on detection technologies to the flight crews?

BSEE Response: Upon completion of the MGD BAST Determination BSEE will publish the results and reach out to industry, including pilots, on this issue. BSEE also expects industry to support our communication activities in this area (see Stage 2 of the BAST Determination Process – Qualified Third Party outreach.

Question 6: Clarify what kind of technology will be explored, available (emerging) vs commercially available?

BSEE Response: The BAST Determination process focuses on technologies that can be procured today; not on emerging technologies (that have too many unknowns and could lead to unintended consequences). BSEE will require use of equipment that meets a minimum level of performance that is proven through third party testing and data analysis and is commercially available.

Question 7: Will you consider other factors in selecting the technology? For example, what is the role of human factors in the effectiveness of the technology? Were the operators SEMS/operating procedures taken into consideration during your assessment? If so, how?

BSEE Response: While we believe other factors, including Subpart S - SEMS, are important aspects of OCS safety, the BAST Determination Process focuses on technology solutions to safety issues.

Question 8: Does the warning to stop helicopter operations while venting gas apply during production or in drilling operations?

BSEE Response: Both. The BSEE BAST Determination on Methane Gas Detection applies to all OCS activities, including drilling and production operations, where volumes of gas may be vented/released to atmosphere.

Question 9: With regard to the technology testing in Stage 2 and comparison of technologies, will you test technologies in a simulated environment?

BSEE Response: The Qualified Third Party to be contracted by BSEE to administer Stage 2 of the BAST Process will sub-contract with technical workgroups (TW) to assist in identifying what testing should be conducted and how to conduct these tests (e.g. development of test protocols). Testing may include simulated (e.g., computer modeling) and/or actual physical testing of technologies.

Question 10: What are the selection criteria to qualify as a third party?

BSEE Response: The BAST Determination Process allows a broad range of groups to apply to be a qualified third party. In the event that BSEE proceeds with a public Request For Quotation (RFQ) to hire a QTP to conduct stage 2 of the process, the selection criteria for choosing a QTP will be made available in advance or as part of the solicitation.

Question 11: How are the other international regulators addressing this issue?

BSEE Response: This issue is being discussed among the International Regulators Forum (IRF). Canadian officials have reported similar incidents. Both the UK and Norway have revised their standards to address this issue.

Question 12: How does BSEE engage with other safety organizations to work on united solutions, for example HSAC, IOGP, API, etc.?

BSEE Response: We coordinate with standards organizations like API, ASME, HSAC and ASTM on a regular and ongoing basis to inform them about this and other safety issues and to receive their input and guidance. BSEE participates on many of the standards committees staffed by these and other organizations as a non-voting member

Question 13: Is there a commercially available technology that BSEE endorses? If not, is the BAST system the right process to address this safety concern?

BSEE Response: No. BSEE does not endorse any one technology, commercial or otherwise. We have identified the safety issue and have established preliminary equipment performance levels in our MGD Technology Improvement Objective (TIO). Now we are reaching out to industry for feedback and to find solutions to the safety issue.

Question 14: Is there a way for BSEE to notify industry about the evaluation process before a formal announcement?

BSEE Response: BSEE will ensure that the process is transparent and that we continue engagement with industry. For more information, visit the BSEE website at https://www.bsee.gov/BAST for information on the BSEE BAST Program, BAST Determination Process and the MGD Technology Improvement Objective.

Question 15: During the assessment phase were there any trends in the size/type of facilities? Single well vs. multiple wells? Size of operator? What about transportation companies? Same? Different?

BSEE Response: No. BSEE did not see any obvious trends during our initial analysis in regards to these variables.

Question 16: With regard to the Cost/Benefit analysis, what are the criteria? What makes something a "go"?

BSEE Response: The BAST directive as written in the OCS Lands Act Amendments of 1978 requires that the use of technology be practical and economically feasible. For the latter, this means that the economic advantages of installing, using, maintaining, etc. the technology is greater than the implementation costs. By factoring in the cost of MGD equipment for use on a selected number of facilities against the costs avoided due to an incident (e.g. loss and injury/damage to life, infrastructure, equipment, and damage to the environment) BSEE will be able to perform an appropriate cost/benefit analysis.

Question 17: Are there time line expectations associated with the BAST Stages/Process?

BSEE Response: Yes, the 3-stage BAST Determination Process is a long process expected to take 2 – 3 years. Please see the MGD Timeline on the BSEE website at

https://www.bsee.gov/BAST.

Question 18: On Superbowl Sunday, in Federal Register (FR) 82 and 22, there was an Executive Order (EO) issued on "Reducing Regulations and Controlling Regulatory Cost". It proposes the elimination of two (2) regulations from the promulgation of one (1). "Regulation" by the FR is defined as law, policy, procedure or practice of an agency. How has BAST and the processes apply in light of this? Is "Determination" a "Regulation" as defined in this Federal Register?

BSEE Response: No, the Federal Register EO does not apply to the BAST Determination Process. The BAST Process is not a new regulation; it is simply another tool for enforcing the BAST Directive under the OCS Lands Act Amendment of 1978 and in BSEE regulations at 30 CFR 250.107.