

Early Kick Detection

BAST Technology Assessment

This document serves to announce BSEE's intention to evaluate Early Kick Detection (EKD) technology as part of the Best Available and Safest Technology (BAST) Program. Use of cost-effective BAST is required by the Outer Continental Shelf Lands Act (OCSLA) to address significant safety issues on the Outer Continental Shelf (OCS). BSEE believes that this assessment is needed to determine if use of BAST involving kick detection and mitigation can reduce the likelihood of loss of well control (LOWC) events.

BACKGROUND

It has been well recognized that the ability of drilling crews to quickly detect and respond to an influx of formation fluids ("kick") plays a major role in reducing the likelihood of a LOWC. The failure to detect and quickly respond to a well control event has been identified as one of the factors that resulted in the Deepwater Horizon blowout in 2010, as well as other well control events on the OCS and around the world.

On July 23, 2013, a well operated by Walter Oil and Gas in the Gulf of Mexico (GoM), ST Block 220, had a LOWC event during well completion operations which escalated to an explosion and fire causing damages in excess of \$10 million. A BSEE panel investigation¹ concluded that the main cause of this accident was the failure of the crew to detect and respond quickly to a kick. Following this event and based on recommendations arising out of Deepwater Horizon, the Chief of the Office of Regulatory Programs (OORP) was requested to determine whether there were cost effective, commercially available technologies that could reduce the risks of LOWC through early kick detection and warning.

The process that BSEE utilizes for making this type of evaluation is the BAST Determination Process (BAST DP²) under BSEE's BAST Program (<https://www.bsee.gov/bast/>). This process, developed with input from stakeholders, allows this technical evaluation to proceed in a logical sequence with input from the industry and subject matter experts. The ultimate goal is to develop performance based criteria centered on a review of existing equipment. At several stages during the evaluation, the process may be terminated if BSEE determines that a technical solution is not feasible or if there are other alternative approaches.

The first four steps of the BAST DP have been completed by BSEE and the objective now is to begin the process of engaging the industry and interested parties in this assessment and review process. To provide the reader with background on the assessment, the four steps completed thus far and the next step planned, are listed below.

¹Walter Report https://www.bsee.gov/sites/bsee_prod.opengov.ibmcloud.com/files/southtimbalier-220-panel-report9-8-2015.pdf

² BSEE's BAST DP <https://www.bsee.gov/sites/bsee.gov/files/fact-sheet/bsee-bast-determination-process-final-november-2015.pdf>.

I. BAST STEP 1.1: SAFETY ISSUE

Based on data from the aforementioned sources, BSEE initiated Step 1.1 of the BAST DP and as a result, determined that sufficient evidence supports BSEE's earlier findings that a potential safety issue exists on the OCS.

II. BAST STEP 1.2: ASSESSMENT AND FINDINGS

BSEE initiated Step 1.2 – Assessment of the BAST DP to determine whether technology solutions exist that could mitigate the safety issue identified from Step 1.1 above. BSEE met with OCS stakeholders, including drillers, operators, and Original Equipment Manufacturers (OEMs) of kick detection equipment to evaluate systems available on the open market with applicability to OCS operations, capable of providing early warning of downhole kicks. Based on these discussions BSEE found that various EKD systems are commercially available that could potentially be used to provide improved EKD and reduction or prevention of LOWC events.

III. BAST STEP 1.3: BAST FEASIBILITY ANALYSIS

BSEE initiated Step 1.3 – Feasibility Analysis of the BAST DP to determine the anticipated cost to industry to adopt commercially available technologies necessary to significantly reduce or eliminate the safety issue. BSEE's analysis concluded that it is likely that there are cost-effective technologies that will allow the potential safety issues to be mitigated.

IV. BAST STEP 1.4: TECHNOLOGY IMPROVEMENT OBJECTIVE

In accordance with Step 1.4 of the BAST DP the agency has developed the following Technology Improvement Objective (TIO) which has the potential to improve safety, health or environmental protection associated with LOWC during well operations (drilling, tripping, completion, workover, suspension, etc.).

Based on an evaluation of commercially available technology, what is the lowest volume of formation fluid influx (in bbls) that can be detected and the earliest detection (in seconds) of the influx measurable in a cost effective and feasible manner?

V. BAST STEP 1.5: PUBLIC NOTICE

In accordance with Step 1.5 of the BAST DP, this TIO is being published for public review for a period of 60 days on www.BSEE.gov. The agency plans on holding a Public Forum to further explain the BAST DP and allow OCS stakeholders to hold discussions with the agency on the TIO, BSEE's rationale for initiating the BAST DP, and the next steps. BSEE welcomes your feedback on the TIO in advance and in preparation of the Forum (date and venue to be

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announced @ www.BSEE.gov). Send your comment(s) to bastweb@bsee.gov and enter the words “EKD TIO Comment” in the subject line.