

BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Beaufort Sea, Chukchi Sea

Title: Updates to the Fault Tree for Oil-Spill Occurrence Estimators (AK-11-01)

BOEM Information Need(s) to be Addressed: The Oil-Spill Risk Analysis (OSRA) is a cornerstone to regional EISs, EAs, and oil-spill response planning. Oil-spill issues constitute a significant portion of public comments submitted on lease sale or development EISs and exploration EAs in the Alaska OCS Region. This study is necessary to incorporate fault-tree spill occurrence estimators into NEPA analyses for Arctic OCS oil and gas lease sales or Arctic development.

Total Cost: \$265,990

Period of Performance: FY 2011-2016

Conducting Organization: Bercha International

BOEM Contact: [Dr. Heather Crowley](#)

Description:

Background: The OCS spill occurrence rates used in non-Arctic BOEM NEPA analyses are based on historical Gulf of Mexico and Pacific OCS platform, pipeline or worldwide tanker crude oil-spill rates. Since 2002, the Alaska OCS Region has incorporated a fault-tree approach which considers 1) differences in oil-spill occurrence factors between the Arctic and Gulf of Mexico OCS and 2) Arctic-specific factors. Previous examples of such analyses include:

Bercha, F. G. 2006. Alternative Oil Spill Occurrence Estimators and Their Variability for the Chukchi Sea - Fault Tree Method. OCS Study MMS 2006-033. Prepared by Bercha Group, Calgary, Alberta, for MMS Alaska OCS Region, Anchorage, AK.

Bercha, F. G. 2008. Alternative Oil Spill Occurrence Estimators and Their Variability for the Alaskan OCS - Fault Tree Method: Update of GOM OCS Statistics to 2006. OCS Study MMS 2008-025. Prepared by Bercha Group, Calgary, Alberta, for MMS Alaska OCS Region, Anchorage, AK.

Bercha, F. G. 2008. Alternative Oil Spill Occurrence Estimators and Their Variability for the Beaufort Sea - Fault Tree Method. OCS Study MMS 2008-035. Prepared by Bercha Group, Calgary, Alberta, for MMS Alaska OCS Region, Anchorage, AK.

Bercha, F. G. 2008. Alternative Oil Spill Occurrence Estimators and Their Variability for the Chukchi Sea - Fault Tree Method. OCS Study MMS 2008-036. Prepared by Bercha Group, Calgary, Alberta, for MMS Alaska OCS Region, Anchorage, AK.

Bercha, F. G. 2011. Summary Final Report Alternative Oil Spill Occurrence Estimators for the Beaufort and Chukchi Seas - Fault Tree Method. OCS Study BOEMRE 2011-030. Prepared by Bercha Group, Calgary, Alberta, for USDOJ, BOEMRE, Alaska OCS Region, Anchorage, AK.

Objectives: Provide an update to fault tree spill occurrence rates and confidence intervals for NEPA analyses for any Arctic OCS Lease Sales and other actions, including for OCS offshore oil and gas developments during the contract period of performance.

Methods: This study will: 1) review and assimilate oil-spill occurrence reports, data and geohazard data from alternative sources and locations as needed; 2) use updated Gulf of Mexico OCS historical data together with its measures of spill size and frequency variance to run the Monte Carlo fault tree model with these measures of variance; 3) provide updated fault tree analyses for Arctic oil and gas lease sales based on BOEM-supplied exploration and development scenarios, generating life-of-field oil-spill occurrence rates and indicators; 4) provide up to two additional fault-tree analyses for Beaufort and/or Chukchi Seas for site-specific oil and gas development taking into account site-specific geohazards and generating life-of-field occurrence indicators; 5) provide a formal report documenting each analytical or fault-tree update, and 6) provide professional support to BOEM in regard to statistical issues of occurrence rates and estimator(s) related to this study and its results.

Current Status: Ongoing

Final Report Due: September 2016

Publications Completed:

Bercha Group. 2014. Updates to Fault Tree Methodology and Technology for Risk Analysis Chukchi Sea Sale 193 Leased Area. OCS Study BOEM 2014 -774. Anchorage, AK: USDO, BOEM, Alaska OCS Region. 109 pp.

Bercha, F., C. Smith, H. Crowley. 2014. Current Offshore Oil Spill Statistics. Proceedings of the 11th International Conference and Exhibition on Performance of Ships and Structures in Ice (ICETECH 2014); Banff, Alberta, Canada July 28-31, 2014

Bercha Group. 2013. Updates to Fault Tree for Oil Spill Occurrence Estimators Update Of GOM and PAC OCS Statistics To 2012. OCS Study BOEM 2013-116. Anchorage, AK: USDO, BOEM, Alaska OCS Region. 33 pp.

Affiliated WWW Sites: <http://www.boem.gov/akstudies/>

Revised Date: August 2016

ESPIS: Environmental Studies Program Information System

All *completed* ESP studies can be found

here: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp