THE ANALYSIS OF CONTROLLED SOURCE ELECTROMAGNETIC DATA FOR PROSPECT EVALUATION IN BLOCK E, SARAWAK, MALAYSIA

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The controlled source electromagnetic method is increasingly used in petroleum exploration. However, interpretation and integration of CSEM data in the context of prospect evaluation is still quite a challenge.

SSB recently acquired several 2D and 3D CSEM surveys in the E-block with state-of-the-art equipments. The survey covered an area of 2250 sq km by dropping 331 receivers and acquiring 582km of 2D, 364km of 3D and 635km of reconnaissance survey. The program is a compilation of operations and R&D initiatives and targeted 10 prospects with up to three 2D lines and a single prospect with a dense grid of 2D lines complemented by a reconnaissance survey covering the entire survey area. Although all acquisition was executed in 2D, actual survey design was such that next to MT, also 3D CSEM data was collected. However, processing and interpretation of those data is the subject of a separate R&D effort and will not be discussed here. The subject of this paper centers on the conventional 2D CSEM data, their processing, interpretation and role in the context of prospect evaluation.

Tying a CSEM response to a specific target is often confused by bathymetry and near-surface geology like gas-hydrates. The E-block survey is no exception. A methodology will be presented to make an inventory of these risks and how to significantly improve the confidence in the data by exploiting this knowledge in further processing and interpretation.

A different, often ignored complication to the CSEM method are regional variations and trends that go undetected by a conventional, localized surveys and that may result in and misleading interpretations. We hope to demonstrate that by using the regional survey, trends and statistics the overall reliability of CSEM for prospect evaluation will further improve.