Burial and Thermal History Model to Evaluate Source Rock, in Tatau Province, Offshore Sarawak Basin, Malaysia

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Hydrocarbons are produced from offshore Sarawak basin. The province consists of Tertiary half-graben basin infilled with carbonaceous coal and clastic sedimentary rocks. This presentation will present burial history, maturation window, hydrocarbon expulsion and subsidence history results of the area. The main points need to know are the vertical extent of strata which can be the source rock for mature hydrocarbon generation and the thermal history of the source rock. According the hydrocarbon exploration records, source rock study in the offshore Sarawak basin, substantial oil and gas reserves are obtainable in lower Miocene and Oligocene age of the cycle I/II strata. Four drilled sections of wells L-1, L-2, L-3 and L-4 were chosen for modeling of hydrocarbon generation history. Oligocene lower coastal plain shale and lower Miocene coaly/shale are the mature source rocks of cycle I/II. They were selected because of their available data and obtained results from the model. All of them penetrated thick sedimentary sequences, including Oligocene and lower Miocene source rock horizons. Maturity interval of the main oil generating source rocks are in the range of 0.75-1.1 vitrinite reflectance (VR %). The modeling of the wells characterizes the thermal and generation history of perspective source rocks in the study area but also the lateral continuation of the horizons within the discovered oil and gas fields. The research works on the stratigraphic sequence of each well lithologies to optimize the model of the source rock due to the available geochemical, seismic, well, and, heat flow. The technique which is important to develop the burial history, hydrocarbon maturation, and generation would be simulated by 1D basin modeling (GENEX 4.0.3) specialized software to cover the full history of petroleum formation for the selected field. This result of the study provides avenue for exploration of deep source rock reservoirs and exploiting effectively the existing petroleum system.