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BOHAI BAY'S PENGLAI 19-3 OIL FIELD: A GIANT IN THE MAKING

In the Fall of 1999, the Phillips Petroleum Company of Oklahoma discovered the giant PL-19-3 oilfield in Block 11/05 of China's Bohai Bay. This discovery will almost certainly lead to the development of a major oil production center for Phillips as well as for the People's Republic of China. Initial exploration in and around the discovery site was conducted by Phillips through its subsidiary Phillips China Inc. and its local partner the China National Offshore Oil Corporation (CNOOC). This paper is a brief recounting of the events immediately preceding one of the most significant petroleum discoveries in offshore China and the rest of world.

Phillips' Worldwide Exploration, in the early 90s, was company-mandated to search for acreage with the characteristics and the potential opportunities of its huge "Ekofisk" field in Europe's North Sea. The ultimate goal was: long term production and the consequent creation of a large-reserves center for the company. China was one of the focus countries. In 1992-93, the exploration team conducted wide-ranging basinal studies that identified and prioritized remaining Chinese basins with the greatest exploration potential. The North China Basin came out on top.

When CNOOC announced the opening of the large 9200 km² Bozhong 11/05 Block in Bohai Bay, Phillips was ready. It managed to purchase the entire seismic and well database even before formal announcement of the bid process. Then in 1994, the company made a bid-- and it bid to win—with minimum commitments of five(5) firm exploration wells, 10,000 kilometers of 2-D seismic, and 200 square kilometers of 3D seismic in the first 5 years of the Exploration period. Phillips won the bid and eventually signed the Petroleum Contract in late 1994, effective January 1st 1995. The work was definitely cut out for all the co-venturers.

Within three months of contract effectivity, Phillips and CNOOC acquired over 12000 kms of new 2D seismic data. In 1996 the first commitment well, BZ 22-2-1, was spud to test conventional deep reservoirs within a structure in the south flank of the main Bozhong source sub-basin. Although the well yielded only non-commercial gas and condensate, it confirmed the presence of good hydrocarbon systems and proved the Bozhong sag to be an excellent source area. It also raised concerns, however, regarding reservoir quality and structural complexities brought about by the highly-faulted nature of the area. This first well was also very expensive.

The concerns were serious enough to warrant a decision by Phillips to spread its risk. A farmout campaign was conducted, and in mid- 1997, Union Texas became a new partner. Due to heavy commitments of the co-venturers, and the relinquishment requirement for the end of the fifth year, another strategy was adopted. Instead of concentrating evaluation around the main Bozhong sag, the partners shifted to evaluating other relatively untested sub-basins in the Block. The next two prospects



drilled were relatively "simple"-- uncomplicated, small structures. This 1997 drilling campaign resulted in the PL 14-3-1 and BZ 36-2-1 oil discoveries. Although these two wells were economically marginal, the technical information obtained proved invaluable. It confirmed that the other sub-basins in the block were also productive, and more importantly, that the "sandier" shallow section was capable of trapping "acceptable" oil. These findings opened up a very large inventory of new prospects all over the block.

In view of the data gathered, it was decided to delay further drilling until a better understanding of the geological and structural picture of the shallower features could be reached. In 1998, a decision was made to run 3D seismic over the two previous oil discoveries, and over a third area covering what appeared to be a very large anticlinal feature masked in part by shallow gas effects. About 1300 square kilometers of 3D seismic were eventually completed. In addition, parallel advanced geological and geochemical analyses as well as structural and fault seal risk evaluations were undertaken. Around the same time that the co-venturers were running these studies, ARCO bought Union Texas and became the new partner. Arco, however, opted to back out of the block, a decision which left Phillips with a 100 % interest. CNOOC co-operated at this juncture by allowing Phillips enough time to re-evaluate its position and decide on a course of action. Eventually, Phillips management gave its full support to drilling the next well.

In May 1999, the PL 19-3 discovery became fact. A gross hydrocarbon column of 485 meters in Miocene Lower Minghuazhen and Guantao sandstones was encountered. Immediately thereafter, Phillips conducted a highly successful seven(7)- appraisal-well program. Published figures now put the field's reserves at 500-800 MMBO. Phillips and CNOOC recently announced plans to implement a Phase I development program that would produce first oil by late 2001 or early 2002. Multicomponent seismic data has been acquired over the PL 19-3 "gas cloud" to better define the structure for development drilling. Full field development is also currently being evaluated. Since the discovery of PL 19-3, similar type plays have been drilled by other operators in the area and new discoveries announced. China's Bohai Bay has definitely seen a resurgence in exploration activity, and now enjoys the probability of new developments. Phillips is simply pleased to have started it all.