

SOUTH CASPIAN BASIN. UNCONVENTIONAL WAY TO SOLVE LONGSTANDING CONTROVERSY AND DISCOVER OPPORTUNITIES OF THE UNEXPLORED AREA

A.V.Nikitin, S.P.Pokrovskii, A.V.Lekomtsev, E.M.Krasinskii, N.V.Amelin

Russia, “Geology Without Limits” Group

Even nowadays when the most of potentially interesting for exploration industry offshore areas with recoverable reserves are covered with a dense grid of 2D seismic surveys – the South Caspian Basin remains an unexplored area with undiscovered hydrocarbon potential. Lack of decent contemporary seismic data and a thick sedimentary cover with a presumable depth of a basement up to 25(?) km led to existence of four different controversial theories introduced by scientific community. Conventional seismic survey with a 6-8 km towed seismic streamer available in the area is not able to image deep buried structures and trace the basement and Moho boundary. Lack of recorded far offsets on the seismic data prevents from revealing the whole scale geological framework of the South Caspian Basin. Dual seismic vessel survey with long offset streamers might help in creating deep depth basin model of South Caspian Basin but this operational setup is pricey. Moreover, the Caspian Sea has its own peculiarities in logistics. Brining seismic fleet to the survey site can increase several times the total price of the enough already rather expensive seismic survey. The case study survey is acquired with help of 6 km streamer vessel available in the area and an auxiliary source vessel with a portable low frequency source onboard. This operational setup will effectively double the recorded offsets by the streamer without considerable increase of the price of the survey and moreover will enable imaging of deep depth targets due to high penetration abilities of the low frequency energy emitted by specially designed low frequency source. In addition, ultralong offsets (up to 100 km) data is going to be recorded by innovative free floating recording equipment. Ultra-long offset low frequency dataset is highly beneficial for FWI accurate velocity model that is the key to high-resolved and reliable PSDM output. The combination of all these tools gives us a chance to clearly illuminate the whole sedimentary cover and robustly trace the basement and Moho boundary of South Caspian Basin. The simultaneous shooting and recording seismic data acquisition technique is a unique solution that takes into account all special aspects of South Caspian Basin and able to solve longstanding controversies and discover opportunities of the area that for a long time was regarded as the very last “blank spot” in the world.