HYDROCARBON POTENTIAL IN THE MAKRAN OFFSHORE AREA

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During the past ten years the Makran offshore area has attracted considerable attention of national and internationals scientists, exploration and petroleum companies to have a better understanding of the peculiar geological and oceanographic setting and to considerably broaden the geological knowledge about Pakistan's EEZ off the Makran margin and its resource potential.

The morphological structure of the Makran, which is strongly influenced by deformation during the subduction processes, is very complex. On the continent and on the upper part of the slope, there are five to seven E-W striking, folded, and elevated accretionary ridges which have been thrust northward, these ridges are separated by ponded slope basins filled with turbidites and hemipelagic sediments, which are horizontal or dip downslope. The large part of the accretionary wedge is well exposed on the continent. A morphologically characteristic deep-sea trench associated with active convergent margins does not exist in Makran.

The Makran continental margin is in an area of high biological productivity in the surface water controlled by monsoonal upwelling. This is one of the causes for the formation of an oxygen minimum zone resulting in a high accumulation rate of predominantly marine organic matter in the marine sediments. Seismic data collected recently from Makran offshore area provided preliminary identification of some hydrate deposits both at and underneath the sea floor. A bottom-simulating reflector (BSR), caused by the impedance contrast at the base of the gas hydrate zone was observed off Makran at about 400m below the sea floor in the single channel seismic profiles. The presence of the hydrate indicates that large volumes of methane are being generated at depth in these regions. Offshore, gas expulsions and turbid waters are reported to occur in places along the Makran continental shelf and slope area. Localized presence of small gas seeps/vents has been noted at the seabed, which perhaps is related to the presence of mud diapir or mud volcano structures in the Makran upper slope sediments. Mud charged with methane gas and traces of heavier hydrocarbon oozes through active mud volcanoes along Makran Coast, which is of special interest in relation to probable oil deposits. Geological, geophysical and geochemical studies of the Makran zone may eventually lead to delineating the potential resources of the area including petroleum deposits.

In recent years, methane hydrates have been considered a potentially vast energy source because of their widespread occurrence in permafrost regions and in most of the world's oceans. It is estimated that the total amount of organic carbon in hydrate gas probably is more than twice that in all fossil fuels on earth. Once extraction proves to be economical, hydrate might replace the oil and gas needs. In future it seems that the Gas Hydrates could be used for commercial purposes such as automobiles and for industry, if the technologies to exploit the methane commercially are developed. This will be regarded as a great achievement of scientists and technologists of the future generations.