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Abstract

The research work was carried out at Sanghar district which is situated at Thar platform, Southern Indus Basin. The research data comprised of seismic lines and well data in SEGY and LAS Format respectively. The name of the well is ICHHRI-01 which is located at 63km North of Bobi field in Khairpur District, Sindh Province. The well was drilled by OGDCL to test hydrocarbon potential of sands of Lower Goru Formation of cretaceous age. The total depth of the well was 3300 meters. The well was abandoned.

The main aim of work revolves around Reservoir characterization in which two approaches of predictive reservoir and realistic reservoir characterization is used. This approach is helpful to get maximum use of the seismic data with less control of wells in an area. The methodology adopt for this purpose is to test and use original workflow for seismic structural and sequence stratigraphic interpretation system(SSIS). The regional seismic lines are used to quickly build a digital chronostratigraphic framework for the Southern Indus Basin (Lower Cretaceous). The sequence stratigraphic meaning to depositional sequences are than assigned. Wheeler diagrams are generated after that which is used in different depositional histories (depositional sequence geometries and stacking patterns within a common stratigraphic framework). Realistic reservoir methods including attribute analysis, spectral decomposition, neural networks and fuzzy logic is worn to minimize the uncertainty which help interpreter to take full use of seismic and geologic dataset. A Neural network is a non-linear statistical data modeling tool which is able to model complex relationships between inputs and outputs or to find patterns in data. An artificial neural network is a computational model based on biological neural networks. It consists of an interconnected group (network) of artificial neurons(nodes) and processes information using a connectionist computation approach (interconnected networks of simple units). Similarly, Fuzzy logic has termed as self-filtering technique using logical expression. This method is proposed as self-filtering technique in interpretation because it will filter out the result and would combine the number of results by using logical expression. It is also dependent upon the knowledge of the interpreter and the way to apply the logic for specific subsurface interpretation. Thus, it termed as self-filtering technique in interpretation.

This research work illustrate how we can correlate our predictive seismic stratigraphic characterization results with realistic seismic characterization and can improve our way to interpret seismic sections along with available well information which further used in forward modeling. The two methods not only help minimize the uncertainty but at the same time requires interpreter to take full use of seismic and geologic dataset. By comparing seismic sections (stratigraphically and structurally) and well logs with realistic reservoir approach it appeared that all the expected reservoir sand layers of Lower Cretaceous are present but the expected reservoir play is towards the western side of the study area.

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