

A Method on Predicting Fluvial Sandbody of Combining with Integrated well and Seismic Data in Gaotaizi area of Daqing Oilfield, China

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The main depositional micro-facies of major reservoir in Gaotaizi area of Daqing oilfield that are distributary channels of deltaic plain or subaqueous distributary channel of deltaic front. Because of the rapid changes of channel sandbodies in vertical and lateral, it is very difficult to recognize and predict distribution of the main channels, which restricts the further petroleum exploration in this area. It is critical how to predict reasonably the interwell channels combining a variety of seismic attributes and well information while less drilling wells. The paper put forward an effective and practical method that based on integrated well information (core and well logging) and seismic data the According to depositional characteristics of the distributary channel in the research area, the idea and operating procedures about this method are formed as follows: First of all, based on wells and seismic calibration, 7 strata sequences of fourth-order sequence have been subdivided and each sequence boundary has been traced and interpreted; in order to get enough seismic attribute information, the seismic grid of interpreting horizon is ensured to be 100m×100m. Secondly, nine seismic attributes of extracted from seismic data which could be useful for sandbody prediction and their correlations with sand ration (the ratio of sand thickness to stratum thickness) have been also analyzed. And then, based on cluster analysis, with multiple regression statistical method, several suitable seismic attributes are optimized and some math functions between sand ratio and those selected seismic attributes have been established according to the correlation coefficients in those research stratum units. Therefore, a variety of seismic attributes have been preferred to describe the distribution of reservoir sandstones and then, sand ratio distribution figure of each sequence could be mapped out. Finally, Reasonable sand ratio thresholds of the main channel for each layer are determined using the method of constraining by depositional micro-facies probability of drilled sandbodies. Thus, distribution maps of the main channel and the associated sand bodies could be outlined and interwell main channels and sand bodies could be predicted reasonably as well. The most advantage of this method is to fully utilize the predictability of seismic information, so long as a reasonable selection of seismic attributes, depositional model applied correctly, more accurate recognition and prediction of channel could be got.