

A STUDY OF FRACTURE MORPHOLOGY FROM BOREHOLE IMAGE DATA IN KARAKUS, CENDERE AND OZAN SUNGURLU FIELDS - TURKEY

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Electrical and acoustic images were recorded in several wells in the Karakus, Cendere and Ozan Sungurlu Fields of Southeastern Turkey, over the past several years. These images which include both electrical (FMS) and acoustic (BHTV) data give an excellent indications of the degree of fracturing and orientation of the natural fracture systems present within the reservoir units. Several fracture orientations can be observed in each well studied and the orientations can be related to local structural events. Typically, the fractures are observed in certain lithologic units in association with faults and unconformity events within the reservoir. Orientation changes in fractures can be observed across faults and plots of calculated fracture porosity indicate and increase in porosity associated with fracture density as well as the proximity to unconformity surfaces. In general, most fractures observed, show a tensional morphology and suggest the rocks failed, probably during uplift or as the result of deformation near faults.

Drilling induced fractures are also observed, and orientation changes in these fractures associated with the principal far-field stress of the rock sequence often occur near fault structures.

The studies performed to date indicate a significant contribution by the fracture systems to productivity. Successful off-setting of producing wells will benefit from an understanding of the orientation and density of fracturing in a formation. In addition, the orientation of natural fractures in a wellbore will aid in the understanding of fault orientations for better mapping of the reservoir from well and seismic data.

UTILISATION OF THE NORMAL GEOTHERMAL ENERGY IN GREECE

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The normal geothermal energy can be used profitably in Greece by applying two types of exploitation systems:

1. With 1000-2500m deep bore holes, which can yield warm water with temperatures ranging from 50^o-100^oC. This type has the disadvantage of high initial research and