

Tectonic History of Hoop Fault Complex – Implications on Fault Transmissibility; Barents Sea / Norway

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Summary: Analyzing the clastic deposits of Mid-Triassic to Upper Jurassic helped to reconstruct the tectonic history of the Hoop Fault Complex, Barents Sea/Norway. The obtained results served as input for a fault seal analysis (FSA). Apatite fission track and (U-Th)/He thermochronology were used to determine the maximum burial depths and exhumation history. According to the combined evaluation of results from shale ductility analysis (BIB-SEM), fault kinematic analysis and structural modelling (section balancing based on a 125 km long 2D seismic section line) the following tectonic evolution can be drawn: deflation of late Palaeozoic salt deposits was initiated by the tectonic activity on the early structures of the Hoop Fault zone. The orthogonal faults of the Hoop Fault Complex developed at the early stage, during Late Triassic to Early Jurassic times at relatively shallow depth, below 1000m. Ongoing subsidence related to the extension caused by the opening of the Atlantic Ocean created accommodation space for Upper Jurassic to Cenozoic deposits with maximum burial depth of 2000 m for the analyzed Mid-Jurassic rocks. The exhumation of the Hoop Fault complex started around 10 Ma and remained constant until Quaternary times (140 m/Myr).

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