

The Importance of the 'Davie Transcurrent Deformation Zone' on Hydrocarbon Prospectivity of the Offshore Blocks of the Rovuma and Tanzanian Coastal Basins, East Africa

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Using satellite-derived gravity data, in combination with seismic, we show that the Davie Ridge represents a N-S-trending broad zone of diffuse deformation (~ 100-200 km wide) that extends from Tanzania to the southwest coast of Madagascar; and thus, it does not define the position of one discrete structure – the Davie Fracture Zone – as depicted on many published structure maps and palaeotectonic reconstructions. As such, we prefer here to use the term 'Davie Transcurrent Deformation Zone' (DTDZ) to describe this zone, which appears to be comprised of a number of N-S-trending major transcurrent fracture zones. A number of these fractures probably owe their existence to the time when Madagascar (and the rest of East Gondwana) was translated southwards, during the Late Jurassic (~155 Ma), from what is now the present day coastline of Kenya/Tanzania, down the east coast of Africa, to its final, present day position by the Early Cretaceous (~118 Ma).

During Neogene East African rifting, the DTDZ was reactivated to form an anastomosing set of N-S-trending transcurrent shear zones that controlled the siting of intense magmatic and extensional activity, expressed by axial basaltic extrusions and half-graben development (e.g., Lacerda and Kerimbass), respectively. The DTDZ is an integral part of the deep water areas of the Rovuma and Tanzanian Coastal Basins and, as such, must be considered in order to reduce risk and uncertainty, particularly in terms of heat flow (thermal maturation history), seismic activity (neotectonic faulting) and structuralisation, if we are to gain an understanding of the hydrocarbon prospectivity of this frontier province.