

An Integrated Evaluation of Geoscientific Data to bring out Hydrocarbon Entrapment Model of South Nagapattinam Subbasin, Cauvery Basin, India

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The objective of this study was to identify and analyse the depositional model of passive margin Upper Cretaceous, to understand the Petroleum system, and to decipher the Paleotectonic evolution and identification of exploration targets of South Nagapattinam subbasin of Cauvery Basin, India. Eastern boundary of Indian plate was rifted from Gondwanaland during Albian time. In the south Nagapattinam area of Cauvery Basin, two roughly North – South trending, easterly hading extensional fault systems are identified. Extensional voids thus created were compensated by north-south trending westerly hading accommodation faults. Late and post Cretaceous tectonics created some east – west trending fault systems. An easterly to south-easterly slope was created due to these extensional fault systems. In this set up, early syndrift sequences of Turonian and Cenomanian age were deposited. In the southern part of the stemmed fault systems, the deposition was mainly dominated by short spanning non-Newtonian flow, resulting in poor reservoir facies. Northern spread apart fault systems supported longish Newtonian flow systems, resulting in well sorted submarine fan and channel fill deposits. End of sequence Turonian triggered by fresh tectonics, resulting in reactivation of many faults in the study area. The next sequence of Coniacian to Lower Campanian age was however deposited in an overall transgressive regime. End of the Lower Campanian was triggered by fresh bout of tectonics and creation of new accommodation spaces. Subsequent depositional mechanism was probably stacked channel systems, in shallow marine environments. Thus attained near peneplanation was however a short lived one, being disturbed by fresh tectonics at the end of sequence K3R, creating a major unconformity at the end of Cretaceous.