The Diverse Turbidite Reservoirs of the West Nile Delta Gas Development Project

Jonathan M. Henton[1], Paul D. Woodman[1], Ajay Chauhan[1], and Mohamed Zahran[1]

[1]Reservoir Development , BP , Sunbury on Thames, Middlesex, United Kingdom.

ABSTRACT

The West Nile Delta (WND) project involves 5 deepwater gas fields. Taurus, Libra, Giza and Fayoum Fields are Pliocene in age, seismically well imaged, dry gas, and normally pressured. Raven field is Miocene, difficult to image seismically, gas condensate and highly overpressured. All the WND project reservoirs are interpreted to have been deposited by slope turbidites fed from the Nile Delta. The traps have been formed by draping of the turbidite channels across a post-depositional anticline. The channel reservoirs have lateral closure provided by sedimentary pinchout towards the channel edges and aquifer contacts to both North and South. The WND Project has been sanctioned and project execution began in 2015 with Taurus-Libra (TL) and in 2016 with Giza, Fayoum and Raven (GFR). Development drilling is ongoing until 2019 and first production from TL is expected in 2017 with GFR starting later. The fields were discovered and appraised during 2000-2008. High quality seismic data was acquired. This has been integrated with a rich well data set including a large amount of core and extensive and diverse log coverage. The datasets have been integrated and show that the fields comprise a large variety of reservoir architectures including channel complexes, channel splays and sheets locally incised by mud-filled channels. During the ongoing development phase a further 21 wells will be drilled providing a significant increase in well data as well as important dynamic information on reservoir connectivity and productivity. This talk will describe the range of turbidite reservoirs deposited in this part of the Nile Delta and discuss possible depositional controls and interaction between facies types. The reservoir facies vary considerably within the different architectures from uncemented massive thick sandstone beds to very thin-bedded sands and siltstones in the Pliocene fields. The amount and distribution of the different facies types is in part related to the depositional architectures. The deeper overpressured Miocene reservoirs in the Raven Field exhibit similar heterogeneities but cementation is locally more pervasive and reservoir quality is reduced especially in thin bedded facies. The higher quality seismic imaging of the shallower Pliocene fields has lead to greater resolution and recognition of different depositional architectures than in the Miocene.