

## **The Development and Integrated Reservoir Characterization of Adjacent Deepwater Pliocene Turbidite Gas-Fields: Taurus and Libra Fields, West Nile Delta, Egypt**

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### **ABSTRACT**

The Nile Delta is a prolific hydrocarbon province. A 2010 USGS assessment estimated that the mean recoverable resource for the Nile Delta Basin comprises 1.8 billion barrels of oil, 223 trillion cubic feet of gas, and 6 billion barrels of natural gas liquids. The Taurus and Libra Fields are two of the five offshore deepwater turbidite gas fields sanctioned for subsea development and tie-back to shore as part of the West Nile Delta (WND) Major Project. Located in the North Alexandria Concession Block, 80 km offshore in water depths ranging from 300m to 700m, the Taurus and Libra Fields comprise Pliocene-aged slope turbidite sandstones arranged within both confined-channels and unconfined splays and levees draped over a NE plunging anticlinal structure. Discovered in 2000 and 2001 respectively, Taurus and Libra were appraised as part of an extensive campaign across the WND from 2007 to 2009 with 3 appraisal wells providing additional reservoir data. In 2013, part of the Libra Field extending into a neighbouring concession was targeted for development with a single gas producer providing an early insight into long term reservoir performance. A reprocessed high-resolution seismic product was made available in 2014 and seismic imaging of the reservoirs is typically excellent in both defining reservoir segment edges and with direct hydrocarbon indicators being used to infer potential gas-water contacts. However, in the WND Pliocene, there remains an irreducible risk for the failure of unpenetrated reservoir segments due to low saturation gas accumulations being indistinguishable on seismic. Two principal segments at Taurus and Libra remained unpenetrated following the appraisal campaign, although these were de-risked based on an analysis of previous geological failure mechanisms due to low saturation gas. Following the decision to sanction Taurus and Libra for development in 2015, 9 development wells have subsequently been drilled and completed across the two fields. The two previously unpenetrated segments proved to be gas-bearing whilst the well results overall have highlighted the heterogeneity associated within turbidite reservoir depositional systems. Using the integration of available seismic, core and wireline datasets, this presentation will describe the current characterisation of these turbidite reservoirs at initial field start-up and discuss some of the remaining uncertainties associated with reservoir connectivity and performance.