Smart Solutions for Today's Geoscientist

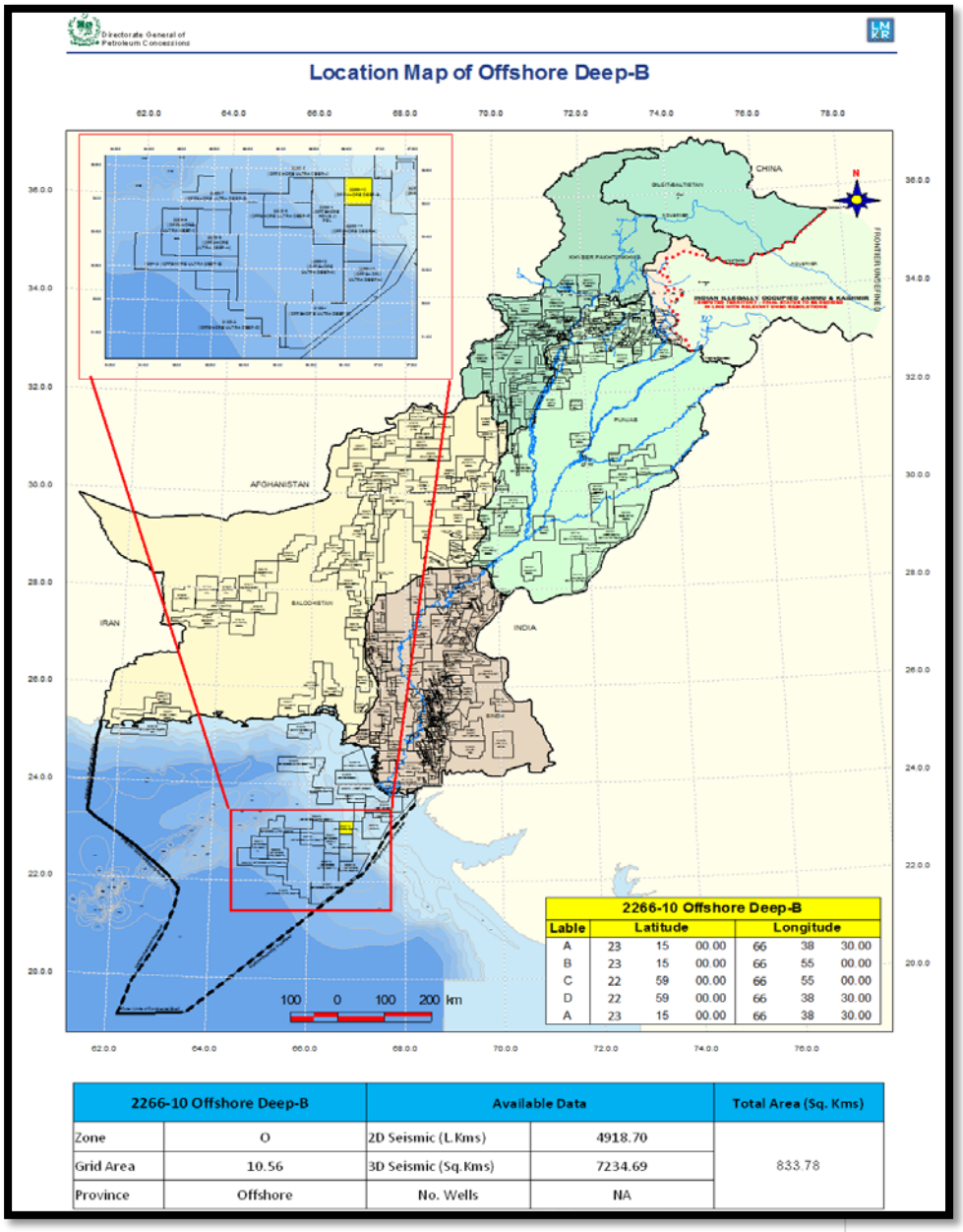
BLOCK: OFFSHORE DEEP B

OFFSHORE BIDDING BLOCK
ROUND 2023

MINISTRY OF ENERGY PETROLEUM DIVISION (DGPC)

INTRODUCTION

- Offshore Deep B Block covers an area of 833.78 Sq. Kms.
- Geological Basin: Offshore Indus, Basin Pakistan.
- The block falls in Prospectivity Zone O.
- ELF, WGC, BP, OXY, Wintershall and Shell acquired 2D and 3D seismic data approximately 4918.698 L. Kms and 7234.68 Sq. Kms in the block within the years 1969, 1972, 1977, 1988, 1999 and 2007 respectively.
- The Block is surrounded by Offshore Deep A (South) block.
- The wells drilled in the near vicinity is Indus Marine-1A and Pakcan-01.



GEOLOGICAL HISTORY

Late Cretaceous – Early Paleocene:

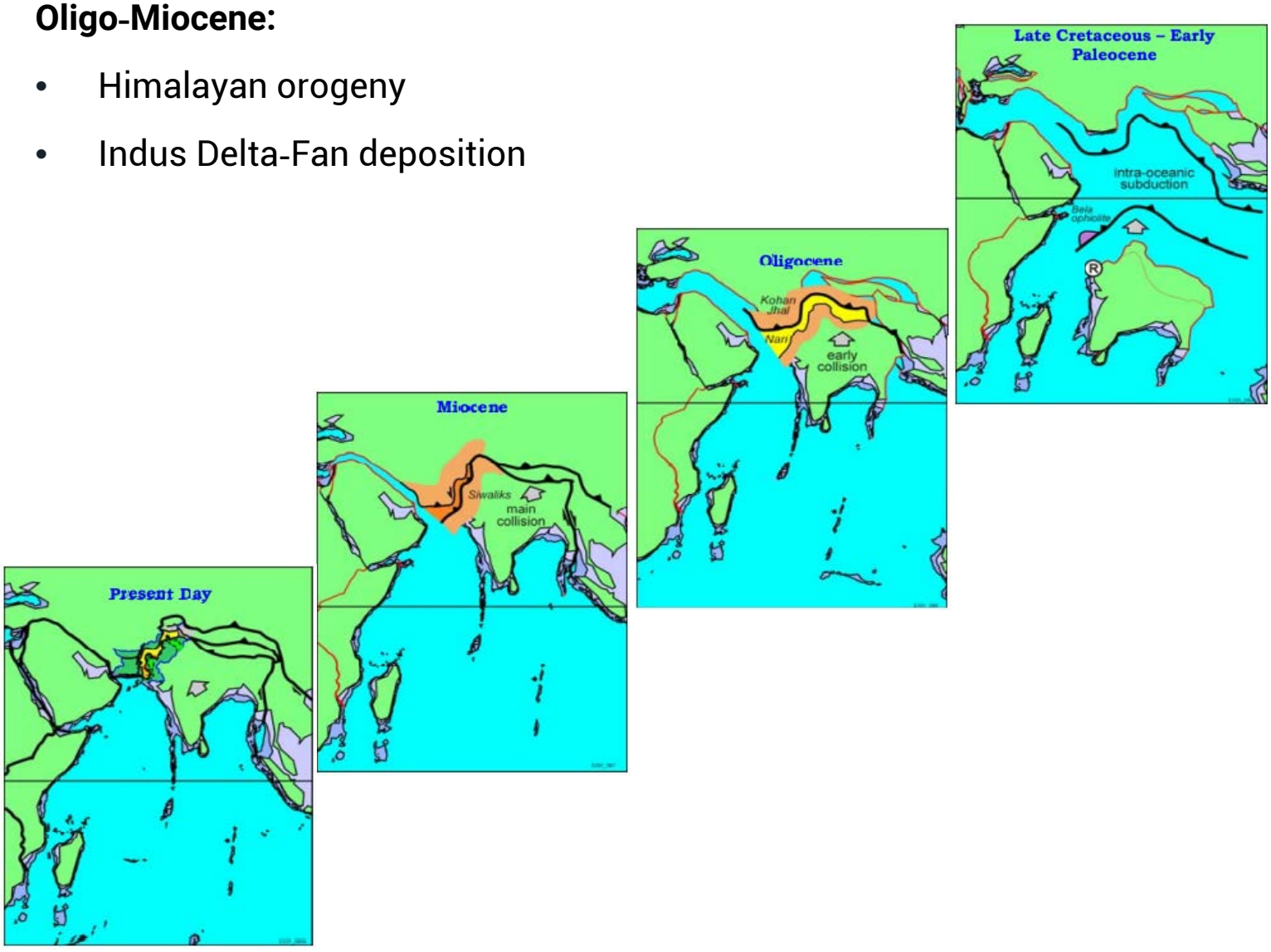
- Rapid northward movement of Indian Plate after separation from Madagascar
- Bela ophiolites obduction
- Extrusion of Deccan Volcanics

Paleocene - Eocene:

- Deposition of limestone on seamounts and shales in lows / depressions

Oligo-Miocene:

- Himalayan orogeny
- Indus Delta-Fan deposition



PETROLEUM SYSTEM

Source Rock:

- Paleocene carbonate section can be the source rock.
- Oligocene and Miocene section can also act as source rock in Offshore Indus Basin.

Reservoir Rock:

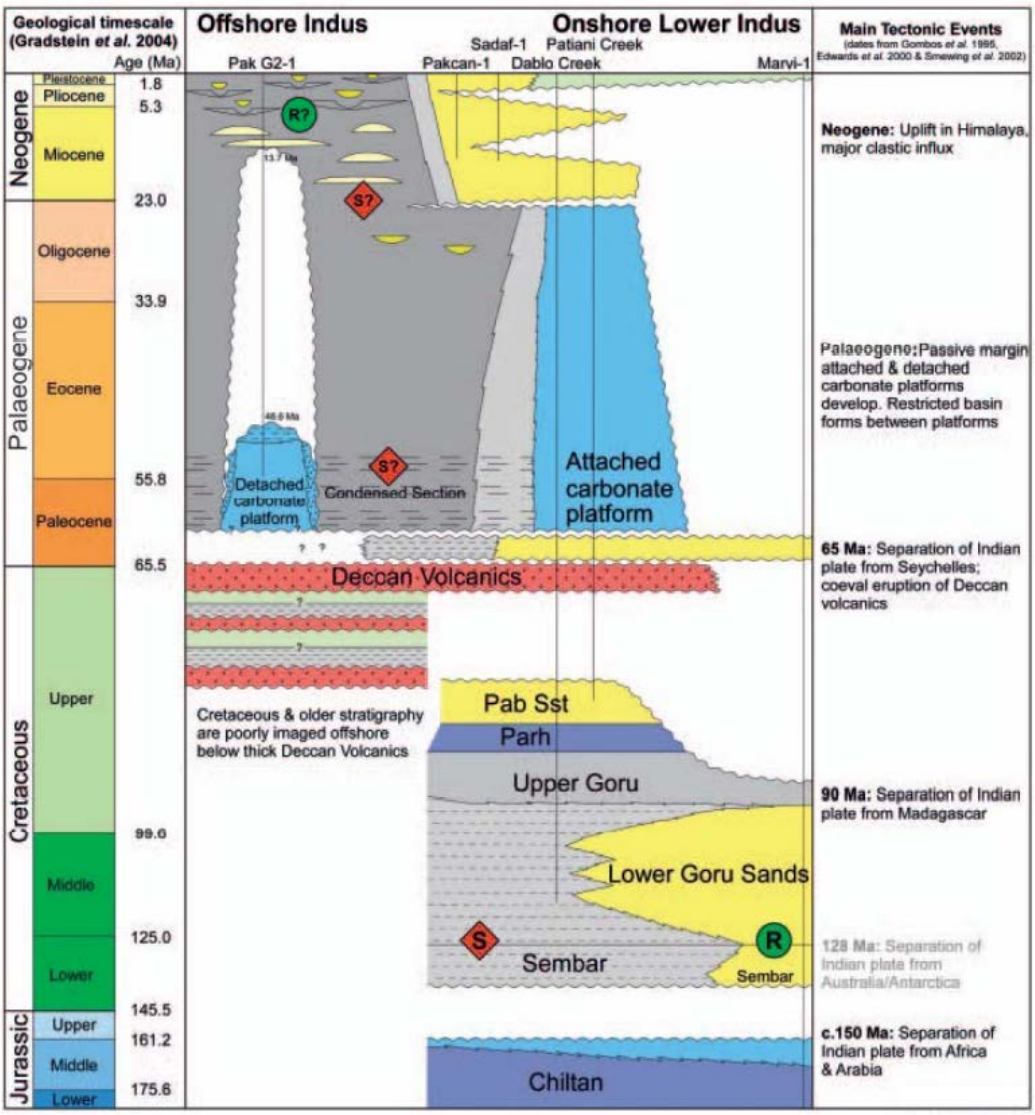
- Miocene sandstones are proven reservoir, Individual sandstone units vary in thickness from 2-50m with porosity ranging between 15-20%.

Seal:

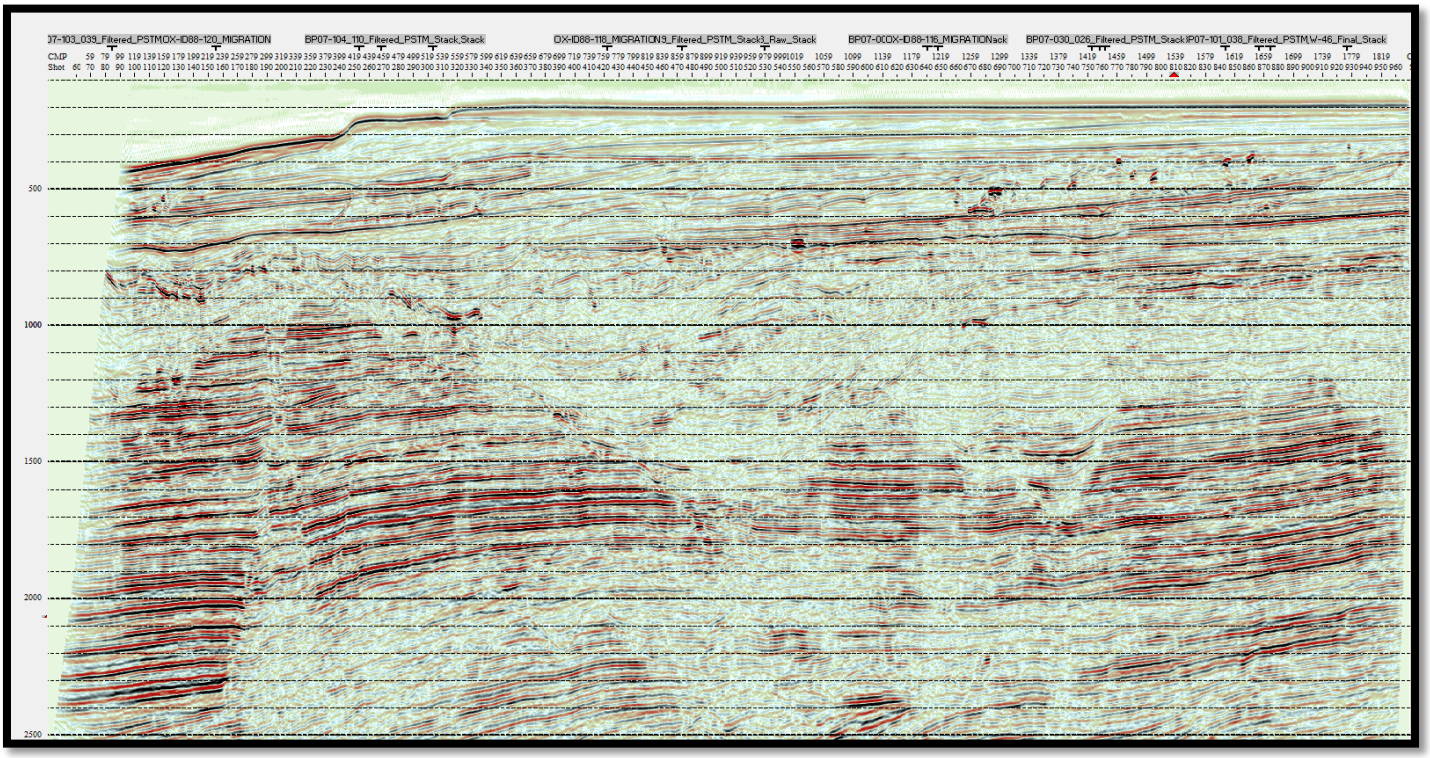
- Intra-formational shales of Miocene would provide seal for the Miocene sands.

Trap:

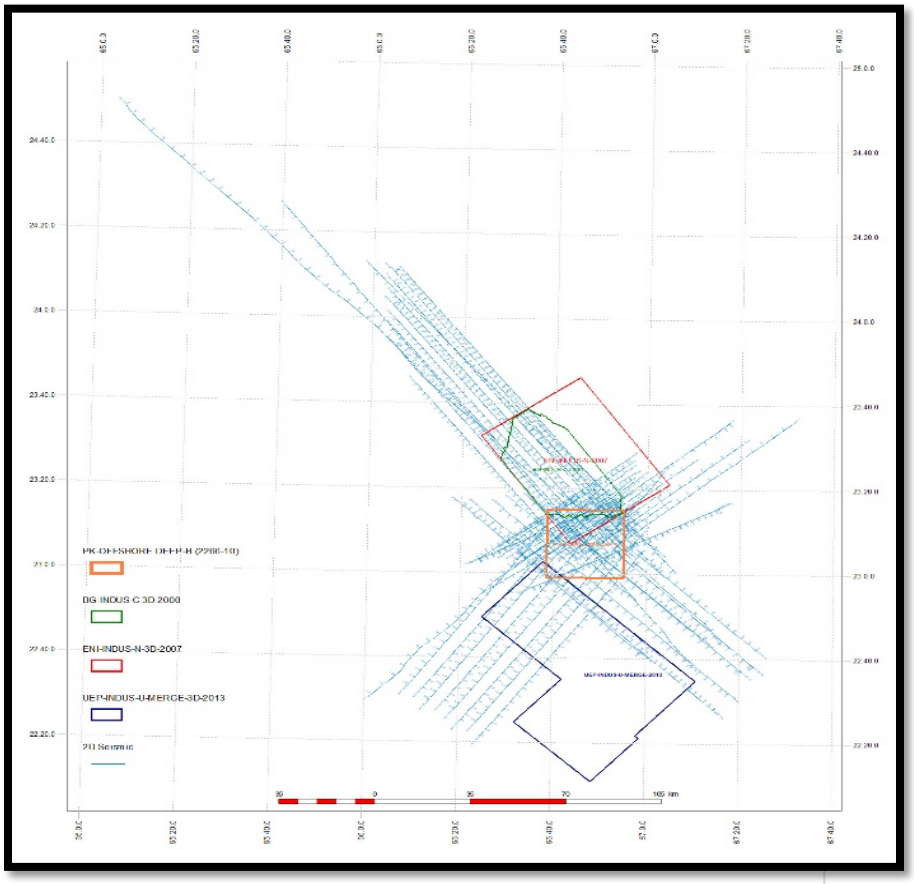
- Carbonates build ups over seamounts, growth faults, roll-over anticlines and stratigraphic traps within deltaic fan system (e.g., bars, barrier islands and pinch-out / facies change etc.) are likely trapping mechanisms



PROSPECTIVITY



- High resolution seismic data can allow to delineate true potential of the block
- Both structural and stratigraphic traps.



EXPLORATION RISKS

- Source & Charge: Medium to High risk
- Reservoir: Low to Medium risk
- Seal: Low to Medium risk
- Trap: Low to Medium risk
- Key challenges for future exploration in Tertiary Petroleum System are to establish:
  - Distribution and timing of effective source intervals' development within the drainage area of prospect.
  - Timing of over-pressuring (up to 7000 psi at 2800m in Indus Marine-1A well) within Miocene section (for Miocene and younger targets) with respect to source rock maturation and expulsion.

OPPORTUNITY

Comparison suggests that discoveries in offshore deltas have been made in:

- Extension of proven onshore petroleum system to offshore at drillable depth (e.g. Niger, Nile, Irrawady & Mahakam deltas)
- Reservoir –Seal pairs associated with good quality but less mature source rock drilled onshore (at shallow depths) progressively mature in offshore (e.g. Krishna-Godavri and Nile deltas)
- Biogenic gas found in shallow younger Tertiary section (e.g. Krishna-Godavri and Nile deltas)

International offshore exploration efforts in delta areas have generally been successful due to:

- Extension of established onshore petroleum system to offshore at drillable depths
- Good quality less mature source rock drilled onshore progressively mature in offshore
- Gas discoveries of biogenic origin.

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