

A Decade of Discovery: CNOOC's Journey in the Guyana Stabroek Block

Author information – Tim Truax, Hamid Medjnoun, Akinyemi Akinkunmi

Affiliation – CNOOC International

Summary

Over the past decade the Stabroek Block, offshore Guyana, has evolved into one of the most prolific hydrocarbon provinces globally and reshaped the industry landscape in South America. From the initial regional studies to early exploration efforts, and ultimately the landmark discovery at Liza-1, the journey in the Stabroek Block exemplifies the power of detailed geologic assessment, collaboration, and calculated risk-taking in the pursuit of high-risk, high reward exploration. This presentation will look at the early days of exploration, key milestones, challenges, and lessons learned throughout this extraordinary journey, shedding light on the early factors that shaped the success of the Stabroek Block.

The geological foundation for exploration in Guyana was primarily built around the concept of conjugate margins, informed by early successes in West Africa with the Jubilee discovery (2007) in Ghana and Mercury/Venus (2010) discoveries in Sierra Leone & Liberia. These initial successes pointed to the potential of deepwater Cretaceous oil plays in analogous geologic settings along the South America Transform Margin (SATM). The first targeted and successful South American penetration of the Upper Cretaceous Play was the Zaedyus discovery (2011) in French Guiana, which captured the attention of major industry players, including CNOOC, looking to find the next 'big one'. The potential of the Guyana Basin began to emerge around this time and was underscored by the diversity of subsurface plays identified within the region, including the analogous Upper Cretaceous clastic play, as well as a Tertiary clastic and Lower Cretaceous carbonate play.

Theory / Method / Workflow

At the outset of exploration, the Guyana Basin presented as a challenging environment for hydrocarbon exploration. The region had no deepwater wells and only a limited number of shallow water wells with sporadic signs of hydrocarbons. Stepping out into the deepwater would involve years of regional work, largely relying on sparse 2D seismic data and limited well control, to contextualize the resource potential and risks of this frontier basin. At this point (2012-2014), the full potential of the basin was still very much unclear, and many key and fundamental geological questions were still being assessed, particularly regarding the reservoir, source rock, and trap style.

The first deepwater well drilled in Guyana was Liza-1 (2015) and this milestone discovery marked a pivotal moment in the history of the Stabroek Block and the country of Guyana. The 'play opening' Liza-1 discovery demonstrated the presence of significant hydrocarbon resources in the basin, derisking major play elements and starting the most successful run of deepwater

exploration activity of the last decade. The discovery was the result of years of detail geological assessments and strategic risk-taking by the newly formed JV Stabroek partnership (ExxonMobil, Hess, and CNOOC).

Results, Observations, and Conclusions

As we reflect on the past decade of exploration in the Stabroek Block, it is clear that the journey has been marked by both challenges and triumphs. The process of unlocking the full potential of the Guyana offshore region was not without its obstacles, yet each challenge provided an opportunity to innovate and learn. The lessons learned from CNOOC's experience in the Stabroek Block are invaluable not only for the company itself but for the entire oil and gas industry. The importance of detailed geologic assessments, high quality 3D seismic data, an engaged partnership, and the willingness to take calculated risks in frontier exploration cannot be overstated. The Guyana Stabroek Block serves as a powerful example of how careful planning, collaboration, and bold decision-making can lead to a new frontier in exploration.

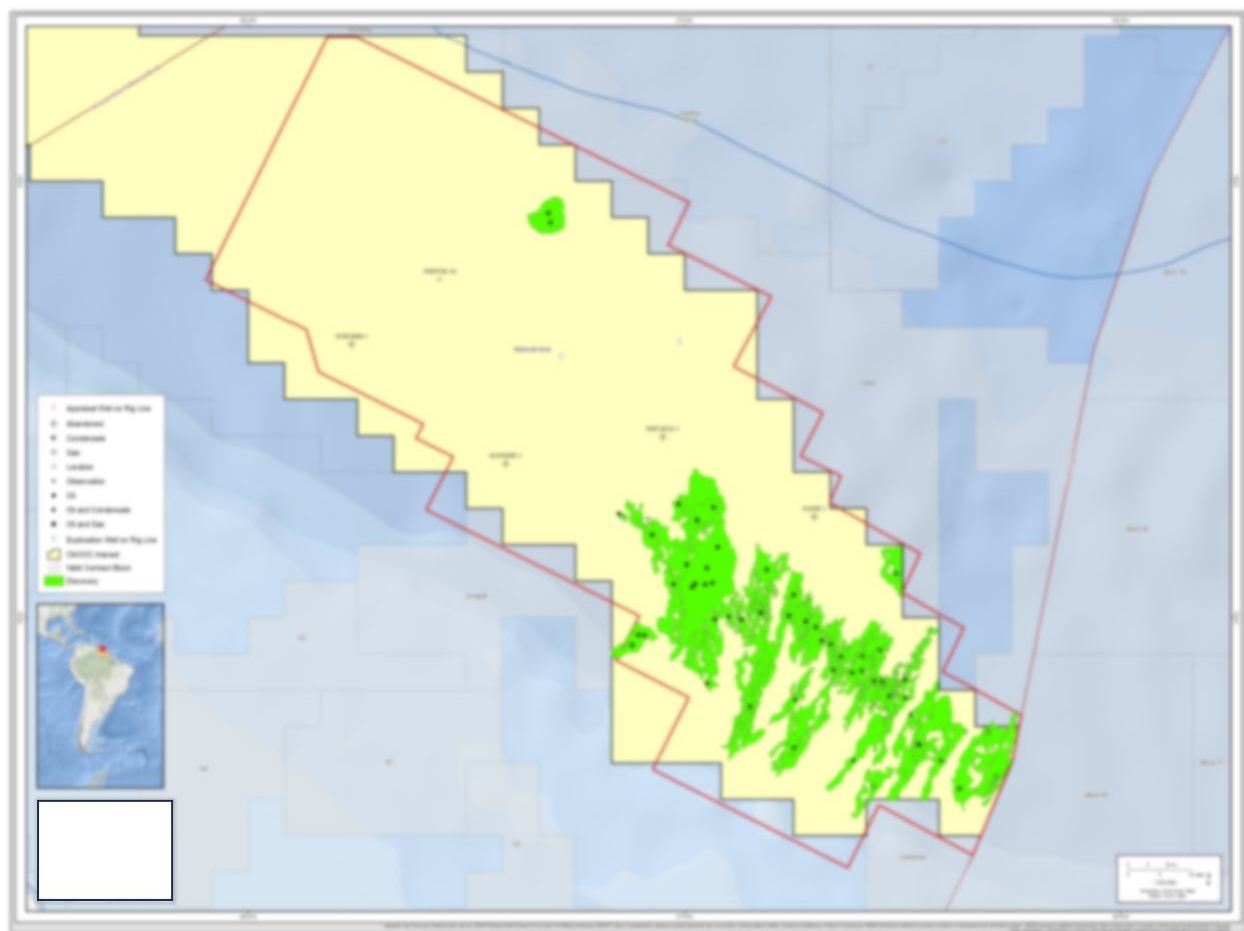


Figure 1. Stabroek Block, Guyana Discoveries (2024)