

Day: Thursday 27 April
 Time: 11:20am

Session: 6

The Pasca ‘A’ Field Papua New Guinea: A Forensic Approach to the Evaluation of a 50 year Old Discovery

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Gerry Burgon was the former Technical Manager of Twinza Oil and the presentation is made on his behalf in recognition of an outstanding contribution to the Geosciences in South East Asia over a 40 year period. Gerry spent two years with Twinza unveiling Pasca’s secrets and was to be the original presenter but, sadly, passed away on the 22nd January 2017.

The Pasca ‘A’ rich gas-condensate field was discovered in a high relief Oligo-Miocene reef by the PASCA consortium led by Phillips in 1968 and was appraised a year later. Both wells proved to be challenging, due to the total loss of fluids while drilling the reservoir, and required the use of floating mud-cap drilling. In total 50,000 barrels of mud and seawater were lost into the formation in each well. The field was cored and extensively tested establishing the presence of a high pressure wet gas liquids accumulation with a hydrocarbon column in excess of 200m overlying a large and active aquifer.

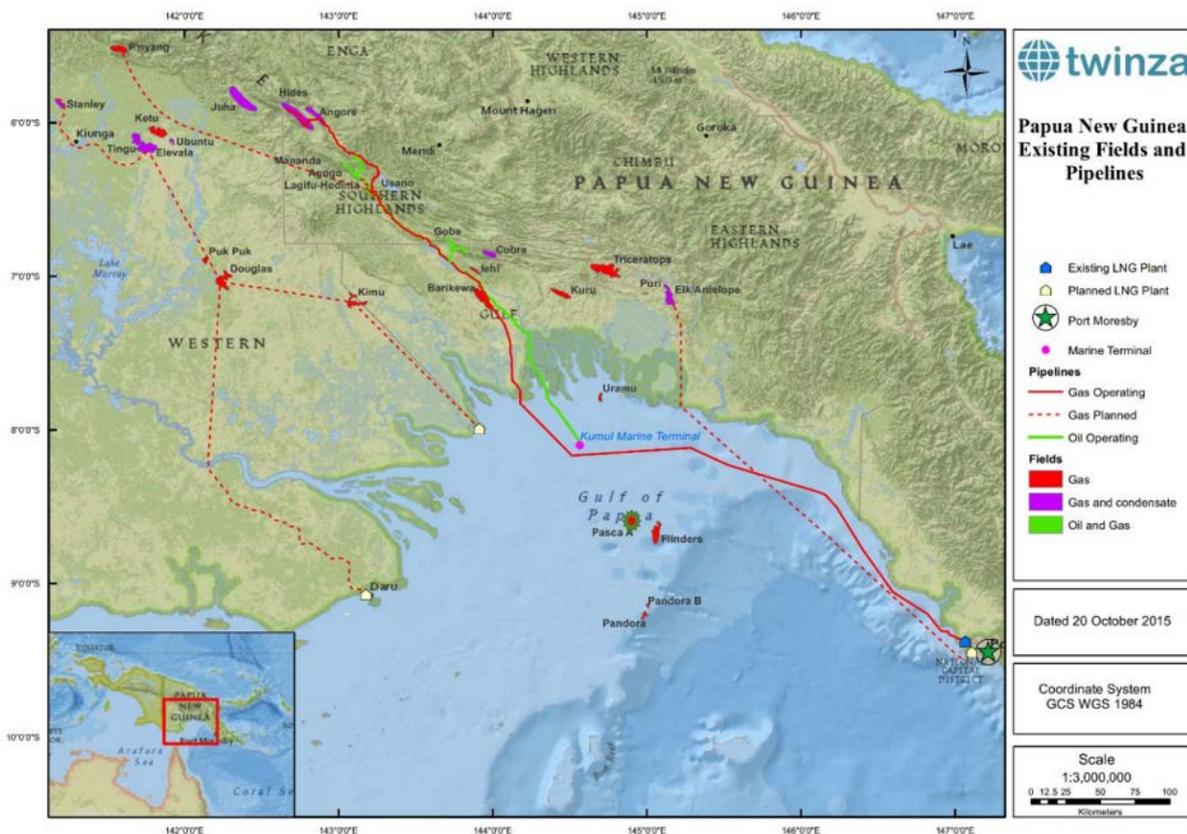


Figure 1: Locality map Pasca ‘A’ field, PNG.

The Pasca 'A' Field was deemed to be non-commercial at the time due to low commodity prices and the lack of a gas market. The field was relinquished by the PASCA consortium and subsequently licensed by Superior Oil. Superior further appraised the field with the Pasca-A3 well in 1983, once again utilizing floating mud-cap drilling through the reservoir. The well was drilled to TD and experienced numerous kicks while tripping out of the hole. With the drill string in the riser the BOP's began to leak and the drillship *Glomar Grand Isle* was pulled off location. Subsequent well control attempts caused the wellhead to leak and the surface casing to fail with gas escape creating a sea-bed crater. The well flowed erratically over a period of three months and abruptly ceased flowing when the well bridged off. Superior relinquished the licence area in 1986.

International Petroleum Corporation (IPC) licensed Pasca as PPL 116 in 1998 and undertook a low resolution site survey. They subsequently conducted a desktop assessment of the Pasca 'A' Field. IPC concluded that a significant gas-condensate resource remained and proposed that "tentative evidence" suggested that the loss of well control in Pasca-A3 was due to deep underground gas flows. IPC subsequently relinquished PPL 116 in 1991. This was the last documented independent report written on Pasca 'A' before Twinza was granted PPL 328 in October 2011.

Upon the award of PPL 328 Twinza had to address some entrenched misconceptions about Pasca-A3 with the ultimate objective being to establish the resource potential of the Pasca 'A' Field. Twinza's methodology has been to resurrect vintage and legacy data by forensic examination using both classic and innovative techniques. These analyses have been augmented and integrated with modern high-resolution data.

The presentation will examine how this approach has maximized the amount of information extracted from the data sets. The following areas will be addressed:

Well data

One of the biggest challenges in working with legacy data is the location of good quality prints or archives. This proved to be a particular challenge for Pasca requiring extensive searching in government archives. The resulting data was scanned, digitized and resurrected. The resulting data has been used for numerous purposes and an example will be presented on how drilling data was used in an innovative way to predict reservoir properties.

Field surveys

Nine field visits have been made to the Pasca 'A' location in the last three years. A large amount of data has been accumulated from shallow hi-resolution seismic, multibeam, sidescan sonar, drop core, ROV, gas sampling, metocean and environmental surveys. New insights into the Pasca-A3 post drilling history and the evolution of the Pasca-A3 seabed crater have been established and imagery from these surveys will be presented.

Rock data

Due to lack of well returns while drilling, less than 1% of the reservoir rock was available for study. Maximum use has been made of the available cuttings and the available core has also subjected to detailed analysis. Examples will be presented on how core photographic analysis and medical scanning technology were used to obtain reservoir properties.

Analogues and reservoir models

Establishing a reservoir model has been a primary objective for Twinza and this has required integration of data from disparate sources. All available seismic and well data were utilised to generate an integrated model. These have been tested and refined by calibration against ancient and recent analogues. A number of examples will be shown illustrating how the available datasets

have been used to constrain the reservoir model.

Speaker Biography

Huw is a co-founder of Twinza and Chief Executive and has 35 years of experience in the Asia-Pacific oil and gas industry where he has undertaken a variety of geological, operational, management and leadership roles leading to senior appointments with operating companies in Singapore, Indonesia and Thailand. Huw has a proven track record of company building and asset development and was a key member of Premier Oil's Asia gas team which successfully brought gas fields in Myanmar and Indonesia to market via Asia's first regionally significant offshore gas pipelines. Huw has been involved in PNG exploration and development since 1983 on the wellsite, in the field undertaking helicopter supported field mapping and managing operations onshore and offshore.