

Role of EWT in Declaration of Commerciality and Field Development

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This paper discusses the steps taken following a hydrocarbon discovery to determine the hydrocarbons in place, deliverable rates, understanding reservoir driving mechanisms and reservoir properties.

The hydrocarbon potential is estimated using data from an extended well test (EWT) and later on a pressure build-up well is drilled to achieve data which can be used to estimate the depletion in reservoir pressure. The reservoir pressure values is useful in identifying the nearest boundaries, effective permeabilities, drainage radius and reservoir drive mechanisms.

Quarterly EWTs were planned as well as flow after flow tests and build up tests to estimate the GIIP and determine the full field development plan.

A systematic and efficient way to achieve the data was necessary so the following tests were carried out in the order defined below:

1. Flow after flow test
2. Pressure build up
3. Production logging test

Having collected the necessary data, a P/Z method was used to analyse the reservoir drive mechanisms while MBAL was used to model the reservoir and carry out GIIP estimations.

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was used to model wells use the test data to find the most appropriate flow correlations and match to them. A GAP model was also created to understand the full field development approach while a 3D reservoir simulation was carried out to compare the GIIP estimation against MBAL.

In fact a number of methods were employed to estimate the GIIP:

- Intermediate EWT
- P/Z
- GAP model
- Dynamic model
- Flowing material balance



All of these methods showed good agreement in the GIIP value increasing confidence in the work done so far.

Conclusion:

- Data obtained during the extended well tests significantly added value and provided opportunities to appraise the field.
- Improved GIIP estimations.
- GIIP estimation methodologies could be compared.