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Reservoir

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Topic:
USE OF DST AND EXTEND WELL TEST

Nelson Nishimura
4 days ago This message has been cross posted to the following Discussions: Projects and Facilities and Reservo...

Mark Rayfield
2 days ago The answer is it depends, but generally in an offshore greenfield situation the absence of a DST/E...

Henry Irrgang
15 hours ago Dear Nelson, The Halibut Field in the Gippsland Basin (SE Australia ~1970), and the Tui area fi...

Robert Hite
11 hours ago Nelson, The simple answer to your question about whether offshore operators go to the developme...

Andrew Odonovan
4 hours ago Nelson, I'd like to support Robert Hite's excellent comments, but with an example where an EWT...

1. USE OF DST AND EXTEND WELL TEST

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Posted 4 days ago

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This message has been cross posted to the following Discussions: Projects and Facilities and Reservoir .

We would like to know if any operator goes on to development phase without use of DST´s and/or EWT´s ?

Mainly considering offshore fields.

Regards,

Nelson Nishimura
Petroleum Engineer
Petrobras
Rio de Janeiro

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2. RE: USE OF DST AND EXTEND WELL TEST

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Posted yesterday
Edited by Carly Wohlers 21 hours ago
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(http://connect.spe.org/network/members/profile/?UserKey=6896b4e2-5729-46cb-8a07-9f4ceb3a7901)

Mark Rayfield (http://connect.spe.org/network/members/profile/?UserKey=6896b4e2-5729-46cb-8a07-9f4ceb3a7901)

The answer is it depends, but generally in an offshore greenfield situation the absence of a DST/EWT is non negotiable to making a risked final investment decision. I looked for examples a couple of years ago of this type and was not able to find any.
Technically the exceptions would be "development as appraisal" in an extension of a well understood cluster style play, with known uncertainties, where the investment in appraisal would be comparable to the NPV. There are examples of these types of development mainly in gas in Eygpt, GoM, Australia I'm aware of but they are not the primary development which is paying for the infrastructure. The other reasons why DST/EWT may be required are regulatory or to secure external funding. The last one is not the case for all companies but it is a generally a hurdle for those who might otherwise choose to take on an additional investment risk.

Mark Rayfield
Principal Reservoir Engineer
Ophir Energy
PerthWA

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3. RE: USE OF DST AND EXTEND WELL TEST

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Posted 15 hours ago
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(http://connect.spe.org/network/members/profile/?UserKey=debb813a-fae7-4c5d-8460-57754ed251a6)

Henry Irrgang (http://connect.spe.org/network/members/profile/?UserKey=debb813a-fae7-4c5d-8460-57754ed251a6)

Dear Nelson,

The Halibut Field in the Gippsland Basin (SE Australia ~1970), and the Tui area fields (Tui, Amokura, Pateke, 2007) in the Taranaki Basin of New Zealand were developed without any DST or production test. They are high permeability fields.

Henry Irrgang
Reservoir Engineer
Irrgang Rsvr Mgmt Pty Ltd
Gymea

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4. RE: USE OF DST AND EXTEND WELL TEST

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Posted 11 hours ago

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(http://connect.spe.org/network/members/profile/?UserKey=a943eed4-d1ad-4fd5-bdb5-d255924dbf97)

Robert Hite (http://connect.spe.org/network/members/profile/?UserKey=a943eed4-d1ad-4fd5-bdb5-d255924dbf97)

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Nelson,

The simple answer to your question about whether offshore operators go to the development phase without using a DST or EWT is absolutely yes. Most of the early Deepwater Gulf of Mexico developments, including the Auger,Mars, and Ursa TLP's were done without such tests and they all were certainly major expenditures with each costing much more than 1 billion USD, and in hindsight, it seems to have been the correct decision. In 2001, I participated in an SPE Applied Technology Workshop entitled "To Test or Not to Test" which thoroughly discussed this topic and at that time certain groups were aghast at the idea of proceeding to a major development without testing, but I am convinced that the dogma of always doing a test is a bad idea and I have made my living over the past 15+ years as a well test guru.

The proper way to decide whether to test is to use the concept of Value of Information from Decision Analysis theory. I would refer you to SPE 110378 that reviews VOI in the petroleum business going back to 1960, but I have found that Dunn's SPE 24672 is a particularly coherent explanation of a subtle, complex idea. For a well test to be valuable, you have to understand both what you might learn from a test and how that new-found knowledge will change your existing plans. For instance the Auger-Mars-Ursa work was done in the mid-early 1990's, but 10 years later when we were looking at the ultra deepwater, the crude had a higher viscosity and the expected perm was lower; in that case a test to determine the permeability was essential to proceed with development.

I hope that helps.

Robert Hite
PTA Consultant
Blue Ridge PTA
Asheville NC

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5. RE: USE OF DST AND EXTEND WELL TEST

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Posted 4 hours ago

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(http://connect.spe.org/network/members/profile/?UserKey=c1165754-430c-47ff-a458-5b19ac9eab7e)

Andrew Odonovan (http://connect.spe.org/network/members/profile/?UserKey=c1165754-430c-47ff-a458-5b19ac9eab7e)

Nelson,

I'd like to support Robert Hite's excellent comments, but with an example where an EWT was critical to the development decision. The Clair field offshore West of Shetland with an estimated >5bn bbls in place was discovered in 1977 and not sanctioned for development until 27years later. More than 25 appraisal wells had failed to prove economic well rates from this low permeability but naturally fractured Devonian reservoir. In 1996, the first horizontal well intersected 6 fracture zones and produced at a steady rate of 15,000bopd without significant decline, demonstrating how the field could be developed and the Clair Phase 1 development was sanction a few years later.

Clair Phase 1 developed only a third of the reservoir volume and was an initial development to test whether waterflood could be effective in this fractured reservoir. Success on Phase 1 - effectively an extended production test under water injection - unlocked the full potential for the Greater Clair Area and supported the subsequent sanction of the larger Clair Ridge project.

This positive example supports Robert's comments - it's about understanding what the EWT or DST or any other production data can tell you that you may need to understand in order to proceed with sufficient confidence to make an investment decision. Equally, if you are sufficiently confident of production rates, drainage areas and recovery mechanisms, usually through sufficient analogue information, then there is no reason not to proceed without these

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costly tests.

Andrew Odonovan
Chief Reservoir Engineer at Bowleven Oil & Gas
AOD Consulting Ltd
Banchory

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