Measure twice, drill once

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When drilling in the Arctic Seas there are several evident challenges compared with the southern areas of the NCS; infrastructure, climate, environmental concerns, as well as different geology and reservoir conditions. 26 companies have recently applied for new areas of the Barents Sea in the 23rd licensing round on the NCS. New areas are being explored in a time with low oil price and a global focus on climate and environment, making focus on handling these challenges more important than ever.

Methods, Procedures, Process:

Operating at remote locations with harsh environments makes it even more important to focus on the details. There is currently no common workplace to easily share data and experience for the Barents Sea. Data is available through Discos after making public, while learnings are shared through different channels, often anonymous and not referenced to the actual location or operator.

Logs; eolog, LWD, Gas, ROP, strat,

Well design, Experience and logs:

The well has to meet its functional demand, mainly penetrating the reservoir at the given point (coordinates and depth) with the right hole size and at a feasible well path. It is the G&G, reservoir engineers that set up most of these demands - but one should strive after getting the D&W department in on this at a very early stage. As an example, going for a slightly different well path will not make a big difference for the license – but may enable a more efficient and less risky project.

To maximize the likelihood of achieving objectives, we need to do:

- Understand what lies beneath us at the given well location. Offset Well information is CRITICAL.
- Select the optimum strategies for drilling tools given what we are up against, while ensuring to be cost effective
- Select a rig that is efficient with not too high spread rate
- Reducing cost by optimizing design, including logistics

Probably the largest factor: Understand, highlight and mitigate risk

Learning from the past

A database of all exploration wells drilled in the Arctic incorporating:

- Well designs
- Easy access to historic log data
- Geo refer Lessons Learned into the offset selection to determine risk factors
- A probabilistic approach to well design and estimation of well timing and cost
- Highlight the main risks for the wells and take these into our well budgets.
- Identifying main risk at planning stage to optimize design

Reservoir characteristics; CCA, SCAL, por, perm

Presssure, mobility, temperature, formation strength:

All pressure measurements are captured for export and analysis. Various formats are standardized and may be displayed and investigated. All dlis and lis files from each and every reported pressure point enabling analysis of pressure point characteristics in terms of fair poor and supercharge. In development wells this is usually not reported as interpreted pressures. Analysis of pressures will allow mobility to be calculated.

Plug analysis of cored reservoirs are reported from Conventional and special core analysis (CCA, SCAL) in various formats, our solution is able to capture every number for export and useful analysis.

Conclusions

Each well drilled has a history of incidents and experiences, these have been reported in various systematic ways, however the ability of compiling and displaying experience on a grand and efficient scale is not commonly available. The Petrobank (Diskos) has been hugely successful in securing data in a safe place, however it has not been effortless to retrieve data for analysis. Our solution presents a graphic display of numbers in Diskos, sharing of experiences between departments and companies and ability to display and export to workstation and GIS platforms for useful analysis.