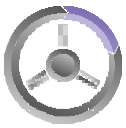
NSTF Wells Task Force



Right Scoping Group

Good Practice Guide to Southern North Sea Drilling Practices

January 2024

1. INTRODUCTION

The Wells Taskforce, under the North Sea Transition Forum, was established to integrate, streamline and add value to the well delivery, management and removal process. The Right Scoping Work Group is one of five groups created by the Wells Taskforce. Its objective is to identify, communicate, and promote good practice in well delivery across the UK industry.

The OEUK Right Scoping Guidelines were produced by the Work Group in 2018. Since then, Well Operators, regulators and other stakeholders have collaborated in many workshops to review each other's well design challenges and to select the optimal design for those wells.
At the request of the Wells Task Force, the Right Scoping Group agreed to use the right scoping approach to investigate SNS (Southern North Sea) Good Drilling Practices.

A cross-industry workshop was held on 28th November 2023 with representatives from Well Operators, Regulators, industry groups and the service sector. The topic was split into three themes and discussed amongst the whole group. The themes discussed were: Cost effective operational / Logistics planning, Right sizing the level of contingency planning, SNS specific Well Control guideline development. The aim of this brief document is to record good practices identified by the discussion groups. A number of opportunities and challenges relating to improved operational efficiency in the SNS were identified which have been included in this report for completeness, but which cannot be considered current good practice.

There are no insurmountable problems with drilling in the SNS but a collaborative approach to share as much as possible will improve efficiency. The planning cycle is longer and requires specific competence, with suitable alternatives and contingencies put in place. Costs can easily escalate and therefore good cost control and reporting is particularly important.

2. DRILLING PLANNING AND CONTINGENCY IN THE SNS

- Drilling in the SNS is characterised by significant technical challenges such as hole stability and well control which unless properly anticipated can jeopardise successful completion of the well. These technical challenges do not occur uniformly across the basin but are highly variable which makes cost effective contingency planning difficult. The following topics should be considered in the planning phase of wells drilled in the SNS.

- For many operators only one well or a small number of wells are drilled at a time which means there is little opportunity to spread contingency costs across several wells. It is beneficial to identify what other drilling activities are planned and making efforts to share contingency resources. This might include a 9-5/8 drilling liner or well control equipment. The NSTA is not in a position to share operational plans however others such as OEUK Wells Forum or EEEGR SNS groups could aid development of such a repository.

- Identification of hazards such as well control and hole stability is difficult and a high level of expertise combined with good input data will improve reliability. Sharing seismic data and interpretation with others has the potential to improve the quality of the result. Conducting peer reviews of the seismic hazard interpretation either with other operators or with industry experts is a worthwhile exercise.

- Peer reviews of well design and drilling programmes are also an effective way to reduce risk and determine appropriate levels of contingency. OEUKS Wells Forum & Wells Task Force have facilitated this in the past.

- Geomechanics analysis and modelling carried out in detail by a specialist are an important tool for reducing risk and selecting appropriate contingency. Hole stability can vary significantly with azimuth and inclination. Real time updates of the geomechanics model while drilling are a further enhancement.

- MPD (Managed Pressure Drilling) has been used effectively by some operators and though not a panacea for all problems, has reduced the uncertainty in well delivery. However MPD adds in own level of complexity and risk. It is reported that at least six months planning is required and the end result showed only a small net financial saving.

- H2S occurs sporadically in the basin and plans need to be in place until the presence of the gas can be ruled out. While offset well records are a critical input to an H2S assessment, they do not always contain enough information to accurately define the probability of occurrence.

- The implications of contingency plans which involve an additional hole section in the Zechstein or elsewhere in the well need to be carefully considered because they may result in a smaller than optimum hole size at TD, sub-optimal surface wellhead configurations, additional overburden drilling risk, or result in compromises to well functionality.

- Propriety fluid loss control materials have been used successfully in the SNS and are generally regarded as better than basic lost circulation material. However in some locations a strategy has emerged to immediately pump cement and sidetrack if losses and stuck pipe occur. A well and product specific operational plan for losses should be prepared as part of the well planning process.

- Finger-printing drilling parameters and well operational characteristics is an essential part of successful drilling in the SNS. Detailed and well understood contingency plans and flow charts are also worth the investment of time in order to have workable plans ready in the event of difficulties.

- There are benefits and disadvantages with both water and oil-based mud. WBM can handle brine flows more easily whereas OBM produces a better gauge hole and subsequently more robust cementation. Mud contamination with formation fluids should be anticipated.

- Detailed well control procedures need to be worked out in detail. These are likely to be different from the approach used in other areas. Many operators have adopted a methodology which allows them to continue operation with minor gains and losses (variations of 10-20 bbls/hr are not uncommon) but only under defined conditions. This requires specific expertise and needs to be formally agreed with both the drilling contractor management and the crews onboard the rig prior to operations. Workshops with crews to agree procedures and contingencies are highly cost effective compared to lost rig time.

3. OPERATIONAL AND LOGISTICS EFFICIENCY

- Reduced activity in the SNS has resulted in the closure of many of the established service facilities in Great Yarmouth, Lowestoft and Norwich. Service companies appear to be supporting SNS work from Aberdeen and it will be necessary for operators to determine whether the remaining facilities in the south are functioning adequately for drilling operations. For this reason, some operators may centralise operations in Aberdeen.

- It is usual now for operators to send the majority of the required equipment on one boat from

Aberdeen at the beginning of the well and also potentially for 'bulky' equipment such as a well test package. But Aberdeen's capacity has declined and equipment may be supplied from other service bases such as Den Helder, Stavanger and Romania which complicates the supply chain further. Supplementary trucking is possible but not very efficient or attractive environmentally. When equipment is supplied from several locations, it is especially important to carry out quality control checks before operations commence.

- Though the main supply line is with Aberdeen, HP risers are still located in the Great Yarmouth area. Waste is generally discharged in eastern England (e.g. Blyth) rather than returned to Aberdeen.

- Fuel commercial arrangements in Yarmouth are different from Aberdeen and may require forward planning and a different contractual arrangement.

- Post Brexit movement of goods between the UK and Netherlands is possible (chemicals difficult) with the correct documentation but the movement of waste across international boundaries is difficult.

- Due to centralization of the service sector around the Aberdeen area, crew changes through Norwich or Humberside may require an extra day of travel compared to Aberdeen. Aircraft capacity is limited and it is recommended that attempts are made to share slots either with other operators or with wind farm users.

- Creating a joint campaign in which two or more operators share a rig has the potential to generate savings and spread contingency and risk. However operational delays in one party's well may have significant schedule impact on the other party which in turn may impact gas delivery commitments. These issues need to be considered in advance. Similarly, critical aspects like mutual hold harmless agreements will take time to put in place.

- There are no insurmountable problems with drilling in the SNS but a collaborative approach to share as much as possible will improve efficiency. The planning cycle is longer and requires specific competence, with suitable alternatives and contingencies put in place. Costs can easily escalate therefore good cost control and reporting is particularly important.

4. SNS OPPORTUNITIES

- OEUK can support operators with an FDP workshop covering environmental submissions relating to the drilling operation. This would include alignment of NSTA and OPRED requirements.

- There may be a role for the East of England Energy Group (EEEG) to support SNS operations.

- Walk-to-Work solutions have been successfully used in the SNS. They may be applicable to some drilling and well operations.

- Combined rig acceptance criteria and processes for a SNS operation have potential to reduce cost.

- Shell have previously maintained a SNS Kick Database but it only includes Shell data. If all operator data was pooled this would be more useful to the industry.

- If a commercially acceptable way for companies to use the same bulk suppliers (mud, cement) in Great Yarmouth existed, this could create the critical mass to allow a service provider to offer a quality service locally.

5. SNS CHALLENGES

- The National Data Register (NDR) is a major source of subsurface and well data. If a technique such as artificial intelligence could be used to interrogate it and produce maps of hazards, risks and benign areas this would be of value. Perhaps a centrally funded project?

- Revive the multi operator campaign strategy.

- Global rig utilization is high which means rig choice, schedule and options are relatively poor for the North Sea.

- Survey work and environmental noise management (Energeo) are currently shared to allow coordination of activities, but the resolution of the timing (8 weeks) is too coarse to allow efficient collaboration.

- Is there a more effective way to share heavy lift vessels and survey vessels not only between upstream operators but also with other industries?

- After the next licensing round is complete, run a 'Hackathon' among interested parties.

- The opportunities presented above should outweigh the SNS challenges to allow for initiation of a SNS collaborative approach.

6. Additional Links to NSTA Wells Task Force & OEUK

NSTA NSTF Wells Task Force: https://www.nstauthority.co.uk/about-us/north-sea-transition-forum-task-forces/wells-task-force/

NSTA Wells Insights: https://www.nstauthority.co.uk/news-publications/wells-insight-report-2023/

OEUK Guidelines for the Right-Scoping of Wells: https://oeuk.org.uk/product/https-oeuk-org-uk-wp-content-uploads-2022-09-guidelines-for-the-right-scoping-of-wells-pdf/

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