

Paper #7-15

THE MOBILE, MULTI-PURPOSE SUPPLY BASE OPTION

Prepared for the
Technology & Operations Subgroup

On March 27, 2015, the National Petroleum Council (NPC) in approving its report, *Arctic Potential: Realizing the Promise of U.S. Arctic Oil and Gas Resources*, also approved the making available of certain materials used in the study process, including detailed, specific subject matter papers prepared or used by the study's Technology & Operations Subgroup. These Topic Papers were working documents that were part of the analyses that led to development of the summary results presented in the report's Executive Summary and Chapters.

These Topic Papers represent the views and conclusions of the authors. The National Petroleum Council has not endorsed or approved the statements and conclusions contained in these documents, but approved the publication of these materials as part of the study process.

The NPC believes that these papers will be of interest to the readers of the report and will help them better understand the results. These materials are being made available in the interest of transparency.

The attached paper is one of 46 such working documents used in the study analyses. Appendix D of the final NPC report provides a complete list of the 46 Topic Papers. The full papers can be viewed and downloaded from the report section of the NPC website (www.npc.org).

This page is intentionally left blank.

Topic Paper

(Prepared for the National Petroleum Council Study on Research to Facilitate Prudent Arctic Development)

7-15

The Mobile, Multipurpose Supply Base Option

Author(s) David George (Shell Marine Assurance)

Reviewers Dale Farmer (ExxonMobil)
Mitch Winkler (Shell)

Date: August 13, 2014

Revision: Final

SUMMARY

With limited deepwater ports in Alaska north of the Bering Strait, past exploration operations utilized mobile supply barges to transport needed material to the area of operations. The Mobile, Multi-purpose Supply Base is an evolutionary extension of this concept which blends crew change berthing, heli-deck, power and communications, refrigeration, and refueling with historic material/waste support services. Options exist for this asset to be either towed or powered. Ultimately, technology provides a solution to the lack of deepwater ports by developing an organic capability that can be placed in proximity to the prospects.

PURPOSE

Provide information on the use of the Mobile, Multipurpose Supply Base option for operations in the Arctic.

BACKGROUND/ONGOING RESEARCH

Drilling operations in the Arctic will need to be resupplied with essential stores during the drilling season to ensure the operation runs on a 24/7 basis. These may be consumables such as food, drill pipe, drilling fluids or crew to operate the rigs and support vessels. In ideal scenario the transit offshore would be completed from deepwater ports with short supply runs in fair weather, however, most Alaska ports north of the Bering Strait provide only shallow draft access with inclement weather often restricting the ability of smaller vessels to transit offshore. With access to deepwater ports being limited this often necessitates long supply chains which require multiple Offshore Supply Vessels (OSV), to ensure a reliable supply chain. This presents considerable challenges and exposures to the continued operation at the prospect. One answer to optimise the supply chain has been to use Mobile Multi Purpose Supply bases.

DISCUSSION/POTENTIAL AREAS OF FURTHER RESEARCH

Mobile Multi Purpose Supply Bases are also known as Ware Barges/Ships/Vessels. A Ware vessel is a floating warehouse used to carry the consumables onsite for drilling and production operations. Ware Barges would arrive in the theatre in the open water season and would be fully

outfitted with all the equipment and spare parts needed for the majority of the operating season. They may also serve a secondary purpose of a Flotel vessel providing either transit or extended stay accommodation for operating crew.

- **Ware Barges.** Ware barges are normally towed to the operating theatre by a suitably sized tug , they are often older deck barges that been converted to the purpose thus they tend to be very strongly built with heavy scantlings which suit the purpose of frequent vessel to vessel activities and the carriage of larger drilling components. The disadvantages of these barges are that they need to be towed to theatre, thus requiring a dedicated tug, where they will normally anchor and operate in a sheltered environment; alternatively if subject to inclement weather a tug has to be promptly available to take the barge under tow if so required. Transit speed is lower than a ware ship thus taking longer to reach and depart theatre whilst also being possibly subject to greater weather impacts. Their advantage is that they do not have the upkeep of an expensive propulsion system thus dedicating more space to the vessels cargo carrying capacity and a lower operating cost.



Towed WareBarge
(Open source information from internet)

- **Ware Ships.** Ware ships have the advantage of greater flexibility; they are able to transit under their own power at a greater rate of knots than a towed barge, thus they can reach theatre quicker than a tow. They can also thus move location at short notice and are able to manage changing weather scenarios easier than a barge under tow. Self propelled barges tend to be the more modern solution to the ware barge requirements, however, they tend to be more expensive due to the main engine and upkeep requirements together with more expensive manning support.

- **Availability of Ware Barges/Ships.** Availability is limited; most are tied to specific projects. Prompt requirements may be met by the Ware barge option, existing deck barges are easily available and conversion may be relatively straight forward depending on anticipated scope of operations. The time frame for delivery of a new dedicated Ware Ship is considerably longer if concept is from new, especially in the United States, there are few self propelled Ware Ships in the US market.



Self Propelled Ware Ship
(Open source information from internet)

RECOMMENDATION(S). Ware Barges/Ships offer the ability to move the warehouse closer to the theatre of operation and thus their value increases incrementally the longer the supply chain to theatre.

- They can remove the need for multiple OSV's through the provision of a local warehouse in more remote prospects, whilst also providing the opportunity for offshore accommodation.
- New Ware ship concepts are readily available in the market place, with multiple proponents looking for a sponsor, the opportunity for significant cost savings with security of supply exists through this concept.
- Given the dearth of Alaskan deepwater ports, especially north of the Bering Straits, the multipurpose ware vessel option becomes a very attractive option that permits the positioning of a supply base near the area of operations that will greatly support supply chain management by reducing the transit times and costs associated with personnel, material and waste transfer.

- Prudent resource investments should be carefully considered in developing this concept to its full potential as full scope operational assurance whilst providing logistical support to Outer Continental Shelf Exploration and Development in the Arctic.

Prepared by: David George
Shell Exploration & Production Company
Email: david.george@shell.com
Office: +1 907 433 3494