



Sakhalin Energy Investment Company Ltd.

Project Alternatives

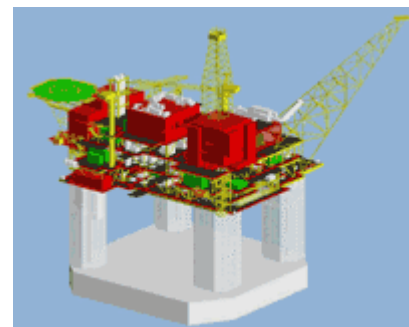
PA-B Platform Site Selection Report

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1 RATIONALE FOR THE PROPOSED LOCATION

Sakhalin Energy Investment Company Ltd. (Sakhalin Energy) will install a production platform in the far east of the Russian Federation, approximately 12 kilometres (km) offshore Sakhalin Island, over the Piltun feature of the Piltun-Astokhskoye (PA) oil and gas field. The location is at 52° 55' 59" latitude and 143° 29' 54" longitude, some 24 km north of the existing Molikpaq (PA-A) production platform on the Astokh feature of the PA field.

A variety of technical, safety and economic considerations influenced the choice of location for the planned PA-B platform. The main factors in determining the optimal location are the location of the subsurface hydrocarbons, avoidance of any drilling hazards, minimizing the number of wells and length of wells needed, and seabed characteristics required to support the type of structure planned. Minimising the total amount of drilling by placing the platform close to the hydrocarbons will limit the use of consumable products and the creation of by-products from the drilling process. The final location is also dictated by the need to avoid hazards such as shallow gas, which is a safety hazard. Shallow gas is one or more pockets of gas beneath the surface of the seabed, sometimes in association with gas seepages to surface. There are no known gas seepages in the PA field. If drilling encounters shallow gas, there is an increased risk that the gas can push drilling fluid out of the well, resulting in a blowout, an unexpected and often violent eruption of oil and/or gas from a well during drilling operations. Another important factor in the choice of location is the need to have a seabed that is firm enough to support the heavy platform; this minimises the amount of dredging and fill required.

These factors were considered in determining the choice of a preferred location for the Piltun platform. The site survey carried out in 2000 indicates the presence of shallow gas layers immediately to the east of the planned platform location. These layers present a serious drilling safety risk that is to be avoided where possible. A move of 7.5 km to the north-east is required to find a similar location east of the shallow gas anomalies. This would require extensive additional drilling with the use of more consumables and creation of further by-products from the drilling process. Moving would not be a benefit from either an environmental or economic recovery of hydrocarbons standpoint. To the south and to the west, the location is bounded by an area of unstable clay at the seabed. This would make it an unsuitable choice of location to support an offshore production platform. In 2001, survey work confirmed the firmness of the seabed at the planned location.

The final choice is supported by survey work carried out in 2000 and 2001 that examined the geological and engineering characteristics of the seabed and shallow subsurface.



2 ALTERNATIVE DESIGN APPROACHES

2.1 Sub-Sea Option

One of the options considered was a sub-sea development (that is, a development without a permanent surface platform). In this scenario, individual wells would be drilled and, once completed, a control system of valves and pipelines would be placed on the seafloor. The drilling platform would be moved off the location and shifted to its next work location. Oil and gas would be produced via the valves on the seafloor, transported in pipelines along the seafloor to a central gathering location and then transported to shore. There would thus be no permanent surface platform at the Piltun field.

For a no platform option, methods would need to be developed to ensure continuous and safe functioning of the seabed facilities under conditions of ice. For example, the lack of access to the wells during winter, when they would be under ice, is a factor to consider. Since there are no major projects in the world producing oil from sub-sea completions under seasonal ice, this is not yet considered a proven option for production at Piltun. Further technological improvements may make this option more viable for future developments.

2.2 Fewer Platforms

The development will involve construction of a new offshore platform at the Piltun feature in addition to modifications to the existing offshore platform at Astokh. Sakhalin Energy has carried out studies with the aim of limiting the number of offshore platforms; up to three platforms were planned for the Piltun area of the field in earlier studies. Over the 1990s, major advances in extended-reach drilling have allowed for a single platform to extend its lateral reach – the extent to which the drilling of oil and gas wells can extend outwards from a single location – to 6 km, a limit that may be extended in the future. This has reduced the number of platforms needed to access the Piltun feature of the PA field. An additional development may be required in the future for the South Piltun feature of the PA field.

Limiting the number of platforms minimises the amount of steel and other resources consumed in platform construction, as well as the environmental impact that results from the construction process, including air emissions. It also reduces the physical imprint on the environment, and significantly reduces the potential for environmental impact to the seafloor and the surrounding water and air. This is also a prudent use of financial resources and results in lower capital and operating costs.



2.3 Extended-Reach Drilling (From Shore Or Existing Platform)

Sakhalin Energy examined the feasibility of drilling from shore-based locations. This is currently not a technically or economically feasible option for the development of Piltun, since:

- the Piltun field is located between 10 and 18 km offshore. This distance is beyond the current economic and technical feasibility for extended reach drilling operations, which is 11 km at most at this depth. In addition even with such wells the hydrocarbon recovery from the reservoir will be sub-optimal.
- the distance between the planned Piltun (PA-B) and existing Astokh (PA-A) platforms is 24 km. Hence, the PA-A platform cannot be used to drill the Piltun field. The distance between the Piltun-Astokh and Lunskeye fields is some 150 km.