

Contract: Agip KCO Kashagan
Client: Agip KCO
Location: Offshore Kazakhstan



Challenge

Kashagan is one of the largest and most significant oil discoveries of the last 30 years. The field is located in ultra shallow water (3-5m) which is completely covered by ice during winter. The development consists of a man-made island – “D” island - surrounded by breakwaters. Temperatures at the field vary from -40°C to 40°C.

Most of the construction materials, modules, and barges enter the Caspian through the northern or southern Russian waters each containing about 18 locks. The technical challenge is to navigate these locks safely and without damage with modules designed to fit within the maximum lock dimensions.

On the island the modules are jacked up onto piles, and pipelines connect the island to the refinery 70km north east of Atyrau. The pipelines were installed in ultra shallow water using shallow water pipelay vessels with dynema mooring lines.

Noble Denton was commissioned by Agip to provide marine warranty surveying, as well as consulting and engineering in the different phases of the project.

Expertise provided

Marine warranty surveying for the experimental phase:

- Loadout and sailaways of 12 Modules of approximately 4,000t each
- Loadout and sailaways of piles, pipes, piperacks, manifolds, LER's and items of heavy lift over 45t
- Marine warranty surveyors for the shipment of heavy cargo from worldwide locations, transshipment in the Black Sea and Sea of Azov, canal transit, transshipment in Astrakhan and road transport to Karabatan after transit up the Ural river
- More than 300 vessel surveys of all construction vessels used on the project

Consulting included:

- Acting as towmasters for Ice Breaking Emergency Evacuation Vessels (IBEEV) and modules through the waterways, as well as barges from Astrakhan across the Caspian

- Mooring analysis
- Seafastening and grillage design for the IBEEV's and cargo barges
- Inclining experiments carried out on most of the modules
- Supervising the ballasting and trimming of the modules before entering the Russian waterways
- Re-ballasting modules before final transit to “D” island
- Vessel vetting surveys for Agip's data base

Other major activities:

- Noble Denton was authorised by the Norwegian Maritime Directorate to approve the 'trim and stability calculations' before departing from Norwegian ports
- Represented Agip at major meetings and on site
- Established Kazakhstan office to work on the Agip KCO Project. The Noble Denton office also services various other oil, construction and vessel companies in Kazakhstan

Outcome and benefit

- Over a 4 year period, a team of up to 21 technical specialists (mariners, naval architects and structural engineers) worked on the project; providing a unique overview of all aspects of transportation and construction on the project
- Noble Denton provided Russian speaking surveyors to liaise with Russian tug crews and authorities
- Noble Denton set up a unique database of useable vessels in the area and influenced the provision of new and more capable vessels including tugs
- Over the duration of the project, Noble Denton significantly increased the quality standard of vessels used on the project
- Noble Denton's Actau office – and full time project team – offered continuous 24 hour cover to all site requirements and survey requests