

RUSSIA

resistant fixed platform for the Korchagin field in the North Caspian Sea, and the Varandey ice-resistant tanker loading unit in the Arctic Timano-Pechorskaya region. The latter will be located 22km off the coast where the water depth exceeds 17m, to enable operation of ice-classed tankers of 40,000dwt to 70,000dwt. A mooring and loading installation capable of revolving through 360deg is to be fitted on the upper hull, with a cargo arm to ensure single-point mooring, delivery of a hose to a tanker's manifold, and loading of oil.

Accent on safety

RS is making extensive efforts in parallel to its commitment to ensuring high standards of maritime safety, security, and marine environment protection. In particular, strict

requirements are being imposed on those personnel involved in the process of classification and statutory surveys.

The society has been undertaking, together with a number of Russian research institutions, a complex series of research projects aimed at quantifying the influence of the human element upon maritime safety and in developing techniques to upgrade the safety management systems of shipping companies.

The results of this research were submitted for consideration by the 53rd session of IMO's Marine Environment Protection Committee. IMO supported the RS work and recognised it as one of the most promising issues in those activities connected with the human element study. RS will continue this research with a view to achieving the target of accident rate reduction.

Since 1998, the international seminars 'Substandard Shipping - Solution through Partnership' have become a traditional forum for discussing the most vital issues of maritime safety by members of the world maritime community. In 2005, those problems connected with the negative impact of man's activities upon the marine environment were discussed at the eighth seminar.

At a forthcoming meeting, speakers will present both a thorough analysis of the ISM Code implementation experience, together with an evaluation of this instrument efficiency and its influence upon maritime safety enhancement and marine environment protection. The subject of this ninth seminar (October 5-6, 2006) will be the ISM Code: Lessons and the Future. 

Transporting gas by Russian CNG ships: becoming a closer reality

OFFSHORE deposits of natural gas hold up to 50% of the explored world reserves. While deposits in traditional extraction areas are becoming exhausted, the demand for energy in the main import markets is growing; therefore, compressed natural gas (CNG) sea transport technology attracts increasing interest, reports the Russian company Intari, since it enables cost-effective commercialisation of offshore deposits, particularly at smaller fields and relatively short distances to market.

The main advantage of CNG technology (as reported previously in *The Naval Architect*) is the possibility of loading the special vessels with gas directly from a deposit and discharging it directly to a utility grid (Fig 1).

As has been extensively estimated by international experts, when the natural gas delivery rate is 0.5 billion m³ to 4.0 billion m³ annually, on sea routes of 250 to 2500 nautical miles, CNG vessels will be 1.5-2.0 times cheaper when compared with LNG carriers. This new technology will utilise already existing and widely used solutions, such as deepwater development of deposits (up to depth of 1000m) and loading/unloading of vessels at submerged offshore terminals.

In reality, the CNG carriers themselves are the only innovation. Lately, a number of reliable technologies for storage and transportation of natural gas under high pressure have been perfected, and so now creating CNG vessels does not seem technically insuperable. A number of companies in Norway, the USA, and Canada are actively involved in this process.

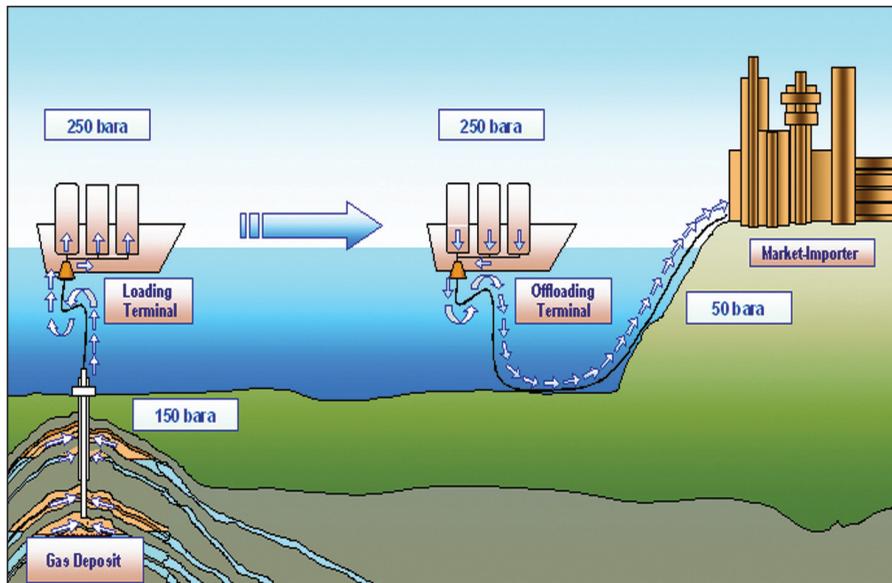


Fig 1. A typical CNG train for commercialisation of an offshore natural gas deposit.

Fig 2. Arctic version of a proposed CNG carrier from Intari.

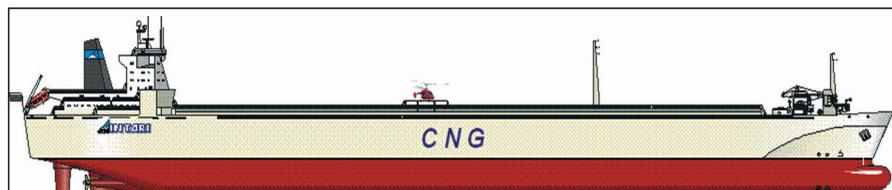
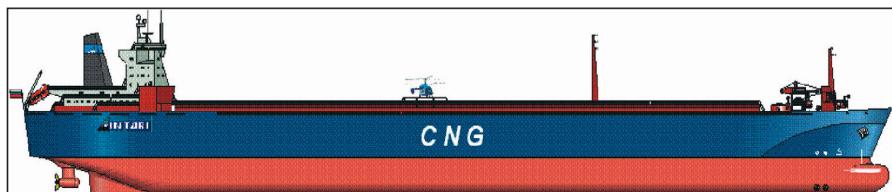


Fig 3. Tropical/temperate version of a proposed CNG carrier from Intari.

TECHNICAL PARTICULARS TYPICAL INTARI CNG CARRIER

Length, overall.....	330.00m
Breadth.....	34.00m
Depth.....	24.00m
Draught, full load.....	11.50m
Displacement, full load.....	84,500tonnes
Displacement, lightship.....	74,420tonnes
Deadweight.....	9080dwt
Length of gas cylinders.....	24.00m
Number of cylinders.....	2200
Cargo volume.....	12 million m ³
Propulsion power plant.....	26,000bhp (19,110kW)
Speed.....	18.00knots

As estimated by their designers, CNG vessels will look much like modern LNG vessels: their length will be between 280m and 320m, with breadths from 55m to 60m, draughts from 13.5m to 14.5m, and capacities varying from 3 million m³ to 33 million m³ of natural gas on each voyage. The first CNG vessels could commence transportation of natural gas in various regions worldwide in 2010-2011.

According to Intari's analysis, Russia possesses enough R&D and production capabilities for creating the key element of the new technology: competitive CNG vessels, with a cargo capacity of up to 12

million m³ (Figs 2 and 3).

Such vessels up to 12 million m³ could be constructed in St Petersburg by Baltic Shipyards, while smaller versions could be built by Admiralty Shipyards or Severnaya Verf, alternatively in Severodvinsk by Sevmashpredpriyatie. Designing and construction of the first CNG vessels, believes Intari, could be completed in five-to-six years. An important factor is that construction costs in Russia are estimated at one and a half times less than in foreign yards.

Thus, real preconditions exist for the arrival in the near future of pioneering Russian CNG vessels, perhaps with a name of a Russian shipping company (possibly named Gas Line). This means that Gas Line Shipping Co, for example, will be able to commence regular voyages with its first two CNG carriers simultaneously with foreign CNG carrier operators.

Due to low cost of transportation by CNG carriers constructed in Russia, the company would have wide opportunities in gas transportation pricing, and operation of the first two CNG vessels could provide Gas Line with high, stable profits and financial security. With stable and high world natural gas prices, the internal rate of return (IRR) is expected to be more than 25%-30%.

Upon Gas Line business expanding and CNG vessel fleet replenishment, IRR could even reach 30%-35%. Discounted payback period (from keel-laying of the first CNG

carriers) will be between seven and eight years. Should adverse conditions prevail and natural gas world prices drop to those of 2002-2003 (approximately US\$125/1000m³-US\$130/1000m³), IRR will be still expected to remain higher than 10%.

Further, development of the company will be determined by a successful marketing policy that can provide advance filling of transportation contracts and by the CNG vessel fleet growth rate.

Orientation on acquisition of cheaper Russian-built CNG vessels is expected to provide the company with additional pricing abilities. Using a 'foreign companies' price minus 10%' policy, Gas Line might be able to increase profits by 45%-60%. However, the company may gain its maximum profit by entering the market not only as a transporter, but also as a natural gas dealer. Thus it will be able to coordinate transport prices with market natural gas and raw gas prices, and to respond flexibly to business environment changes.

In the anticipated situation of stable high world gas prices, the transport component in the price chain (taking into account export fees and a 10% discount for Gas Line clients) could amount to more than US\$100/1000m³. Besides economic advantages, a CNG-based business should be highly flexible: should a natural gas deposit exhaust or should market situation become unfavorable, a CNG vessel can be repositioned in other deposits and markets. Ⓢ

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