

THE TERMINAL

Conclusion of the research task: **safe**



prof. habil.
dr. Vytautas
Paulauskas

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Terminal project: preparatory works as scheduled

On the 12th of September, the liquefied natural gas (LNG) import terminal development plan was presented to all institutions and associations concerned. The terminal development plan also includes the findings of the Strategic environmental impact assessment (SEIA). Sweco Lithuania, as the party in charge of the implementation of the plan invited the parties involved in the project to present their views and comments on the findings of the environmental impact assessment.

The SEIA report was prepared by 26 specialists in different areas, including Dr. Romas Pakalnis, Chairman of the Lithuanian National Commission for UNESCO who worked on the landscape implications, Prof.Habil. Dr. Brunonas Gailiūšis, Head of the Hydrology Laboratory of the Lithuanian Energy Institute, and Dr. Jūratė Kriauciūnienė, responsible for the assessment of hydrologic regime, Assoc. Prof., Dr. Gintautas Zabiela, senior researcher at the Institute of Baltic Sea Region History and Archaeology at Klaipėda University who assessed the culture heritage implications, and Prof. Habil. Dr. Vytautas Paulauskas, a navigation expert, and others.

Comments – at an early stage

Aidas Vaišnoras, Vice-President of Sweco Lithuania invited, at this early stage of the SEIA study, all institutions and authorities concerned –



The floating storage regasification unit (FSRU)

info

Key parameters of the tanker

Capacity – **130-170,000** m³ of liquefied gas.

Length – about **290** m.

Width – about **50** m.

Capacity of the regasification unit – up to **3** bn m³/year.

Ministry of the Environment, Ministry of Social Security and Labour, Ministry of Culture, the State Service for Protected Areas, municipalities, etc. – in the spirit of well-meant co-operation to consider and present their findings in order to identify and agree on shared expectations at an earliest possible stage to avoid any disputes or repeated work at a later stage after a major share of the work has been completed.

Aidas Vaišnoras just noted that the time frame allowed for all works was quite tight – the LNG terminal is scheduled to be put into operation in 2014, and all the required permits

will have to be obtained and the necessary research conducted prior to the commissioning of the terminal. And especially so that the project is of strategic significance not for Lithuania, it has an all-European dimension.

Focus – sustainable environment

The most important principle of sustainable environment, the underlying idea in developing the environmental impact analysis represents an objective to strike a right balance of the three major factors – social, environmental and economic that each covers several aspects to be assessed.

The social factor incorporates security of gas supply, international relations, as well as aspects of civil security and emotional considerations. The environmental factor covers the landscape, cultural heritage, biological diversity, and environmental, water and noise aspects. The economic factor includes a number of other implications, such as the development of the Klaipėda State Seaport,

land use, construction and operation costs.

The concept of the development plan

The process of planning of the LNG terminal development included a thorough consideration of possible locations for the construction of the terminal (following the audit of 11 sites) and, as a result, offered three possible suitable alternatives – the Southern part of the Klaipėda Seaport at the Kiaulės Nugara island, the Northern part of the Klaipėda Seaport at Melnragė and the sea area close to Būtingė. Drafters of the development plan further intend to consider two possible locations – at Būtingė and close to the Kiaulės Nugara island. The latter was determined as best fitting the project's purposes.

Further followed the consideration of the alternative technical solutions – capacity of the terminal of 2-3 bn Nm³/m with scaling possibility, a floating storage regasification

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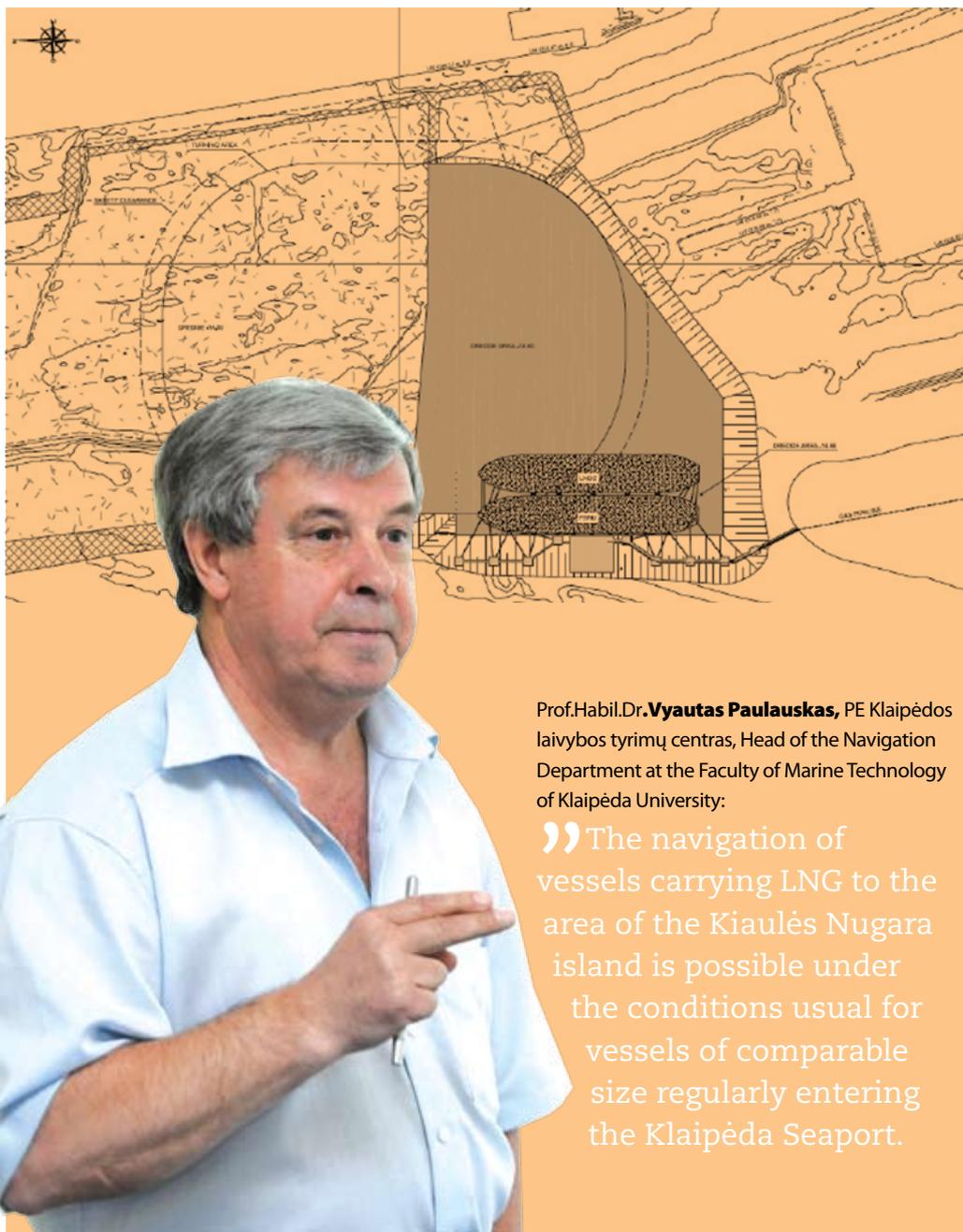
The liquefied natural gas (LNG) will not interfere with vessel navigation and the navigation of LNG carriers along the channels of the Klaipėda Seaport is safe – these were the conclusions of the specialists that assessed and estimated the conditions for navigation and different other parameters relevant for the designing the liquefied natural gas (LNG) terminal at the Klaipėda Seaport.

The undertaking included the analysis of the possible sites for the development of the LNG terminal at the Klaipėda Seaport and in the open sea, navigation conditions, LNG vessels to deliver liquefied natural gas into the Klaipėda Seaport. The task also included the required navigation computations and definition of the possible limitations for the navigation and operation of LNG vessels.

“Selection of the site for the terminal and its capacities required a thorough assessment of the inherent navigation conditions. This also included the assessment of the navigational safety of the terminal and the adjacent piers, also identification of the sites ensuring the least impact of the LNG vessels upon the operations of the other terminals of the port” – says manager of the working group, Prof. Habil. Dr. Vytautas Paulauskas, a specialist in marine transport, logistics, and shipping management.

Vytautas Paulauskas says that the natural gas carriage is one of the most rapidly developing areas in marine transportation sector.

Large-scale LNG terminals operate in the United Kingdom, Norway, Spain, Belgium, France and other countries, and one LNG terminal is under construction in Szczecin, Poland. Furthermore, liquefied oil gas terminals have been successfully operating in Sweden, Denmark, Germany, Finland, Latvia and other places.



Prof.Habil.Dr.**Vytautas Paulauskas**, PE Klaipėdos laivybos tyrimų centras, Head of the Navigation Department at the Faculty of Marine Technology of Klaipėda University:

”The navigation of vessels carrying LNG to the area of the Kiaulės Nugara island is possible under the conditions usual for vessels of comparable size regularly entering the Klaipėda Seaport.

Safe

“Surveys conducted showed that where the wind of any direction is not stronger than 12m/s, all LNG vessels, at regular speed, can safely enter the port, moor to the LNG vessel terminal, unload the liquefied gas and safely leave the equatorial area” – says Vytautas Paulauskas. The survey used a simulator to test LNG vessels that are most likely to be entering the port. Currently such vessels are 288-300 m in length. Also the survey showed that the modern navigation devices cur-

rently used by pilots of the Klaipėda State Seaport Authority can enhance the navigation safety of LNG vessels which will facilitate the safe entry of LNG vessels into the Klaipėda Seaport.

Recommended

The survey report reminds that the safe navigation of LNG vessels requires the port channels to be not less than 14.5 m deep. The minimum channel width in straight sections for a largest vessel to pass has to be not less than 150 m, and

175 m at turns. The vessel rotation basin must be not less than 600 m in diameter.

The navigation survey also showed that the scheduled port infrastructure development and deepening works currently in progress will improve the port navigation conditions.

The research report includes recommendation for arranging additional LNG vessel navigation training for pilots and tugboat captains by using training vessel operation simulators.

The tender for the procurement of the vessel- storage announced

On the 20th of September, AB Klaipėda nafta announced an international tender for the procurement of the floating storage facility with the regasification unit for the liquefied natural gas (LNG) terminal. The contract with the successful supplier is expected to be entered into by the end of the year.



Rokas Masiulis, General Manager of AB Klaipėdos nafta.:

”We have selected the most optimal offer that will ensure the commissioning of the LNG terminal as scheduled – by 2014”.

“The floating storage facility is the main part of the LNG terminal infrastructure. The parameters of the storage facility will determine the subsequent technical solutions and the price of the entire project, therefore, we expect our potential suppliers to enter into some serious competition” – says Rokas Masiulis, General Manager of AB Klaipėdos nafta. – We have selected the most optimal offer that will ensure the commissioning of the LNG terminal as scheduled – by 2014”.

The applications for the participation in the negotiations and the initial proposals have to be filed by the 24th of October. The following two days will be devoted to the evaluation of the participant qualification and sending invitations to eligible tenderers to participate in the procurement process. The invitation letters to eligible suppliers to submit their tenders shall be sent by the 25th of November with the term for

the submission of tenders expiring on the 2nd of December. The successful supplier will be selected before the end of the year, the decision to be further approved by the Board of the Company and the General meeting of shareholders. The initial task will include the assessment of the character of the technical, financial, legal solutions, and the terms of the solutions offered by suppliers. Further will follow a discussion and negotiations concerning possible solutions, formulation of the final requirements that would fully meet the needs of the LNG terminal.

Two procurement methods

Considering the recommendations of “Flour S.A.”, the lead adviser for the LNG terminal project, the preferred floating storage facility with the regasification unit (FSRU) to be

acquired is of a capacity not less than 130,000 m3 liquefied gas.

The vessel-storage facility will be acquired by one of the two possible methods: according to the Build Operate and Transfer agreement under which the supplier shall deliver the terminal, will operate it for a prescribed period of time and later on transfer the title to the terminal and the responsibility for its operation to AB Klaipėda nafta; or according to the Lease and Operate agreement (where the Lessor will be providing the terminal operating services), under which there will be no transfer of the title to AB Klaipėdos nafta. The advisers have suggested that due to the comparably reasonable initial capital investment requirements both methods are most advantageous for AB Klaipėdos nafta for implementing the LNG terminal project.

The port will be properly prepared

With a view to facilitating the development of the Klaipėda State Seaport and the possible construction of the liquefied natural gas terminal the Government decided to expand the internal aquatory of the port by nearly 270 ha. The aquatory will now extend to the Kialulės Nugara island in the Curonian Lagoon and the Southern administrative line of Klaipėda city. The southern part of Klaipėda city at the Kialulės Nugara island is currently a priority location for the construction of the LNG terminal. The territory is equally relevant for the operation of the port since the development plan also provides for the expansion of the terminals at the Southern part of the port and the deepening of the aquatory to serve vessels of larger draught. The commissioning of the gas and load terminals will intensify activities in the Southern part of Klaipėda Seaport and create numerous new jobs.

The Ministry of Transport and Communications of the RL

Will not intervene

The Klaipėda Seaport Authority will seek to take over the idle deviation structure located in the territory of the port aquatory and demolish it. As of today, an appeal has been filed with the Prosecutor office concerning the sale of the structure that may potentially interfere with the LNG terminal project; the prosecutor’s office imposed the provisional security measures on the use of the structure, claimed Eugenijus Gentvilas, Manager of the Seaport Authority. According to Eugenijus Gentvilas the owner of the structure seeks to sell it and the Seaport Authority has significant doubts as to its potential purchaser. *BNS*

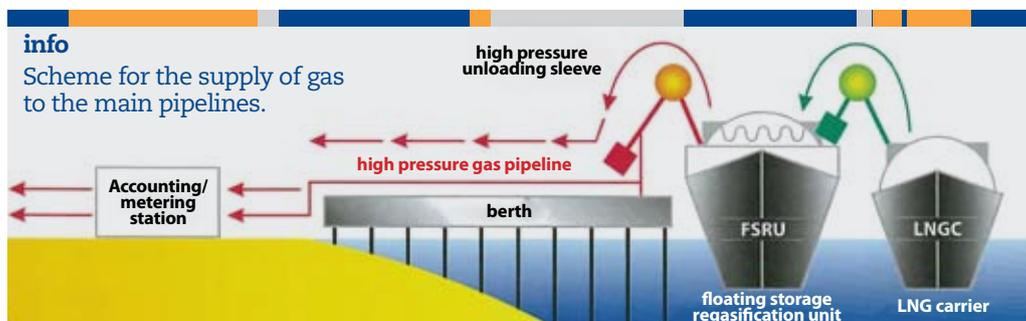
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Terminal project: preparatory works as scheduled

unit (FSRU), or a floating storage unit (FSU). The evaluators eventually decided that the most suitable technological solution for the LNG terminal in Lithuania is the water-based terminal with a facility for storage of liquefied natural gas.

Evaluations came in a range

The strategic part of the LNG terminal development plant included the assessment of the dynamics of the natural gas demand and supply, geography of natural gas resources specifically in relation the geoenergy policy, compliance of the development of the terminal with the national energy strategy, devel-



opment of the balanced national energy (gas) sector, and the relevant requirements of the EU energy sector regulations.

The technical part of the project includes the analysis of the possibilities and technical solutions for strategic alternatives for the development of

the gas sector, e.g., the underground gas storage facility, link with Poland or shale gas. The document also includes the analysis of the current status of the gas sector, possibilities for the development of the gas network (hydraulic permeability), and the LNG technology.

The evaluation part defines the scope of the strategic environmental impact, e.g., assessment of the natural and social environment (landscape, protected areas, coast erosion, the hydraulic regime of the Curonian Lagoon, etc.), civil safety, also the cost-benefit analysis.

All you wanted to know about the LNG terminal

The Liquefied natural gas terminal is a national project of strategic importance, the commissioning whereof in 2014 will enable national consumers – both residents and enterprises – to purchase gas not only from the currently monopoly Russian Gazprom, but also from several other suppliers at a competitive price.



The residents, however, have a number of questions concerning a possible impact of the terminal upon their lives. You are welcome to ask us any subject-related questions and by answering you we will disperse all kinds of myths.

MYTHS	FACTS
Is it true that the liquefied natural gas (LNG) technology is a novelty in the world?	The natural gas liquefaction methodology has been applied for more than 50 years. Today the LNG market is rapidly growing and LNG appears as an alternative to oil and oil products. Today there are over 100 LNG import terminals operating in the world, and 387 vessels operated to carry LNG.
Is it true that there are no LNG terminals in Europe?	There are 57 LNG terminals operating in Europe. The Europe's largest LNG terminal operated in the United Kingdom, with a capacity of 18 bn m ³ LNG per year. The Netherlands is currently expanding its LNG terminal to the annual capacity of 22 bn m ³ . The smallest capacity regasification units – up to 0.7-1.4 bn m ³ /year operate in Cyprus, Greece and Sweden. The first LNG import terminal in the Baltic Sea region this year was opened in Sweden. Poland is in the process of the construction of the LNG terminal in Szczecin.
Is it true that LNG is explosive?	No. LNG contained in the storage facilities cannot explode as there is no oxygen in the storage tanks.
Is it true that after the LNG terminal is commissioned small industrial vessels, cutters, yachts and fishing boats will not be allowed to enter the Curonian Lagoon?	No. The LNG terminal will not cause any restrictions for the traffic along the current navigation channel to the Curonian Lagoon.
Is it true that transportation of LNG by vessels is very dangerous?	No. LNG has been carried by vessels for 50 years already. During this period there has not been a single instance of collision, fire or explosion. LNG is transported in double-housing tankers that sustain the required below-zero temperatures. The capacity of the tankers ranges from 5,000 to 266,000 m ³ of liquefied gas. An average tanker of 120,000 m ³ in capacity can carry 72 m ³ of gas.
Is it true that LNG is stored in tanks that are not entirely leak-proof?	No. LNG is stored in special storage repositories tightly isolated from any external impact. Such repositories may be overground, underground or mounted on LNG tankers. In Lithuania LNG shall be stored in floating LNG repository with a regasification unit.
Is it true that LNG is toxic and a hazard to human health?	No. LNG is not toxic, has no smell or colour, it does not cause corrosion. Delivered to Lithuania LNG will not be placed at any direct exposure to humans, therefore; it will not cause any hazard to human health.
Is it true that the ultimate site for the LNG terminal has been already selected – the Kiaulės Nugara island at Klaipėda?	No, not yet. The priority site for the LNG terminal in Lithuania is the Southern part of the Klaipėda Seaport; however the final decision will be taken only after the completion of the environmental impact assessment.
Is it true that the structures of the LNG terminal will be erected on the Kiaulės Nugara island?	No. In Lithuania the LNG terminal technology provides that tankers will be approaching the floating storage facility with a regasification unit, and the gas will be pumped by tanker pipes to the floating storage facility ("side to side" technology).
Is it true that LNG tankers are so large that they will hardly manage to cross the Klaipėda Seaport gate?	No. Panamax vessels that are similar in size are regularly safely sailing in Klaipėda Seaport aquatory.
Is it true that LNG tankers will be entering Klaipėda Seaport every day?	No. LNG tankers will be entering Klaipėda Seaport not more than twice per month.
Is it true that LNG is the same as natural gas?	Yes. LNG is natural gas in liquefied form. When cooled to -161.5C° natural gas condensates into liquid form. Since liquefied natural gas takes 600 times less space than in gas form, it is easier portable in long distances.
Is it true that in the very foreseeable future vessels in the Baltic Sea will be obliged to use fuel of lower sulphur content.	Yes. New, more stringent requirements for vessels sailing in the Baltic Sea will be effective as of 2015. The vessels will have to use lower sulphur content fuel, or opt for an alternative fuel, for example gas, less pollutant to the environment. Compared to conventional fuels, usage of LG reduces the sulphur dioxide emissions by nearly 100 %, carbon dioxide – by 20–30%, and nitrogen oxide – by 80–85%, etc.