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Breakthrough LNG deployment in Inland Waterway Transport

Activity 3.1 Study on financial lease concepts of
exchangeable fuel tank containers

Report

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1 INTRODUCTION

This is an introduction into activity 3 "Study on innovative financial constructions in the business-client –relation for LNG vessel retrofitting.

The objective of this activity is the further development and testing of innovative financial constructions for the retrofitting IWT vessels with LNG fueling technology in order to facilitate the transition to LNG for the IWT fleet.

The Study on innovative financial constructions consists of the following tasks:

- 3.1 Study on financial lease concept of exchangeable fuel tank containers.
- 3.2 Pilot on proposed solution for the Capex /Opex paradox

This report is the result of the study following the task described under activity : 3.1.

3.1 Study on financial lease concepts of exchangeable fuel tank containers

Project partner Trifleet leasing will conduct a development study on financial lease of exchangeable LNG Fuel tank containers for IWT vessels. The standardization of these tanks lowers their price compared to the existing on-off tanks. Part of this study is creating an agent network, for example LNG suppliers and bunker facilitators who will rent the containers to their customers. The financing need and wishes of the end users will be investigated in detail and used for further development of the lease concept. The main advantage is the maintenance, repair and periodic testing is decoupled from vessel operation which reduces disturbance and delays.

Aimed result of this study:

Report on financial lease concept of exchangeable fuel tank containers.

2 STANDARDIZATION of an EXCHANGEABLE LNG FUEL TANK

This paragraph describes the history of this research of standardization of the fuel tank.

LNG tank containers for IWT vessels:

Currently LNG propulsion systems used on IWT use an LNG fuel tank which is ordered from different manufacturers on a one-off basis. The costs for such fuel tanks are relatively high because of engineering and project costs involved which need to be recovered in a sale of a single container. Would it be possible to standardize the fuel tanks and offer different type of use (transport modes) for these tanks it will be possible to order and build these tanks in larger numbers and therefore will be able to increase production efficiency, optimize specification, optimize performance and divide engineering and project cost over a larger number of tanks.

An already existing type of equipment is a tank container which is suitable and approved to transport LNG by road, rail and sea. Would it be possible to also approve such container for the use as an LNG fuel tank as part of an propulsion system on board an IWT vessel without having to deviate substantially from the specification of a

standard LNG transport tank container, it would be able to create economies of scale which makes it possible to order and build such tank containers at larger numbers and reduce the costs per individual fuel tank.

When the tank container would be used on board an IWT vessel two ways of bunkering were considered. One being a method whereby the tank container would be exchanged. Meaning that an empty LNG tank container would be lifted off the vessel at a bunkering station or container terminal and a loaded LNG tank container would be placed on board the IWT vessel.

Another option would be to use the LNG tank container as if it was a normal static fuel tank.

During the course of the project discussions have been conducted concerning the options above with various potential business partners. At first instance, it was welcomed to have reduced costs when using an LNG fuel tank container as if it was a static LNG fuel tank simply because of the lower costs per LNG fuel tank. The concept of exchanging the fuel tank on board was first received with reticence, likely because this was a complete new concept. However, it was found that the demeanor towards this concept gradually changed as the advantages were recognized of being able to use these same fuel tank containers in different ways such as: in the distribution network; as intermediate storage solution; as part of bunkering facility; offered flexibility with regards to exchange of fuel tanks on board because existing container terminals could be used for the handling.

To be able to make this concept work and become successful some important hurdles and problems needed to be solved. One being regulatory issues, second being the ability to finance equipment which is removable from the IWT vessel. Besides this there are some restrictions with respect to the dimensions of the LNG tank container. The standard dimensions for an ISO LNG tank container is 40' (approx. 12 metres) long times 8' (approx. 2.5 metres) wide. This gives certain restrictions as to where such containers can be positioned on board an IWT vessel especially when the IWT vessel would be retrofitted with an LNG propulsion system. Shipbuilders however generally advised that the standard dimensions of the container are not a big issue especially on IWT vessels designed to transport containers, as the LNG tank container has the same size as a standard 40' container. The more challenging hurdle is the standardization of the regulatory requirements. It turned out to be impossible to standardize these requirements as the classification authorities require that an LNG propulsion system on an IWT vessel is approved separately requiring individual calculations and approvals and often custom made technical solutions subject to the situation on an individual IWT vessel. Besides this some of the requirements would result in a tank container with a specification that is far different from a standard LNG Transport container and should also be technically adjusted, subject to requirements of the classification authority. As a result the costs per LNG fuel tank container will be negatively impacted.

Consequently, unless regulatory requirements are changed and standardized it will not be possible to create a standardized exchangeable LNG Fuel tank container¹.

Would it however be possible to standardize the LNG Fuel tank container, various options to process the financial and operational costs of the fuel tank container into the operational costs of the ship owner become in reach.

When the LNG Fuel tank container is used as static tank on the IWT vessel, then the tank could be purchased, financed through its mortgage or leased from a Leasing company. In this case the regulatory testing protocol on board the vessel as described in the approval documentation of the classification authority should be followed.

When an exchangeable LNG fuel tank container is used on board an IWT vessel, then the tank container can be purchased, financed through its mortgage or leased from a Leasing company. In these options the ship owner and also the bank will likely prefer to have the tank container bunkered while on board of the IWT vessel and will not be lifted off the vessel for bunkering, because they would wish not to run the risk of losing control over the asset.

An interesting option is when the exchangeable LNG tank container forms part of the LNG Fuel distribution network. In this situation the container would be leased to a distributor or bunkering station. The operational costs of the LNG fuel tank container can be transferred into the fuel price per kilogram. Testing, repair and maintenance can be organized separate from the day to day distribution operation which is believed to be more costs effective compared to doing this on board of a vessel which automatically results into downtime of the IWT vessel. Several service stations, yet mainly in the Rotterdam / Antwerp area, are available which could support this operation.

3 LEASE CONCEPT

Leasing versus buying an LNG FUEL tank container

Operational Leasing offers financial benefits and can be less expensive than ownership in the short term because the lessee only pays for the use of the container and depending on the leasing model chosen for the testing and maintenance of the asset. Leasing also requires less upfront payments and credit approval processes are often easier as compared to conventional financing. Leasing is interesting when cash flow is tight and margins are slim. Leasing is also an interesting option when capital investments are needed in other areas.

Leasing contracts are for a fixed period with fixed monthly costs, when during this period the technical requirements for the LNG Fuel tank container changes, there is

¹ See also report 'Report – LNG fuel tank containers and non-containerised tanks' on the website: <https://lngbinnenvaart.eu/downloads/>

the option at the end of the lease not to renew but terminate the agreement and lease-in new or other equipment which does meet the renewed technical requirements.

When a ship owner decides to invest in an LNG Propulsion system, a substantial part of the investment involves the fuel tank. When using a standardized LNG fuel tank container the purchase costs of the fuel tank are less compared to a one-off tank, such resulting in lower monthly costs. Currently banks are reluctant to extend loan facilities for ship owners and therefore leasing is an interesting solution also because banks normally require a large upfront payment.

In order to identify the position of banks concerning leasing of LNG tank containers as part of the LNG propulsion system on IWT vessels, several consultations have been conducted with banks that are involved in financing companies who own and operate IWT vessels. The topic of leasing LNG tank containers appeared to be new to them. Normally a fixed diesel fuel tank is part of the ship (design) and is co-financed in the vessel's mortgage. An ISO tank container used as LNG fuel tank is totally a new concept to the banks and no advice on this point will be given till such a project will be officially presented.

When the ISO LNG tank container is actually going to be used as a fuel tank on IWT vessels, one will consider how to place it within the funding and whether it will be accepted to finance the fuel tank container through a lease construction, separate from the vessel's mortgage. The current standard requirement is that all essential components to operate an IWT vessel can not be financed separate from the vessel mortgage. Would banks agree to have the fuel tank leased they will require the IWT vessel to be powered using a dual fuel (Diesel and LNG) engine.

4 TECHNICAL

Attached :

- Standard specification for an LNG Transport tank container.

5 CONCLUSION

Based on the previous conclusions (reference also made to report 'LNG fuel tank containers and non-containerised tanks' prepared for activity 1.2) Trifleet decided to stop the research towards an approved certified standard fuel tank container. It is being concluded that under the current circumstances a standard is not feasible and a type approval is not possible. With this conclusion, the concept of an exchangeable fuel tank container must be considered as non-achievable. Sub-activity 3.1 has herewith ended.

Figure 1: Standard 40' – 46000L 7/10 barg UN Portable T75 / ADR R14,3BN LNG tank.

