



## EXMAR FSRU - Eemshaven LNG

Floating Storage Regasification Unit (FSRU) modified for the integration in the EemsEnergyTerminal in the Netherlands.

MULTI.engineering provided a basic engineering package including schematic drawings and calculations, as well as a detail engineering production package. Primary focus was on modifications to the gas discharge and heat exchange system of the vessel. Involving also placing of new platforms and the pipe supports. All to be executed in a short time frame as the date for vessel operation was already determined.



*"Very challenging project that tries to contribute to solve the present energy crisis."*

*B.L. (Project Engineer MULTI.engineering)*

**NO ENGINEERS, NO FUTURE !**



### CLIENT

- Shipping company which has developed over the years into an innovation driven gas energy provider.
- Activities in Shipping, LNG Infrastructure, Ship Management & Supporting Services.
- Offices worldwide.



### ASSIGNMENT

Design modification of an FSRU for integration in EemsEnergyTerminal.



### LOCATION

Eemshaven, The Netherlands.



### MULTI.engineering SERVICES

- Relocation gas offloading manifold.
- Integration of heat exchange system.
- Integration of electrical shore power supply.
- Structural analysis and design of platforms and supports.



### ADDED VALUE

Experience and knowledge at MULTI.engineering ensures that a very large amount of work can be done in an extremely short time frame.



## 2022 SUFFERS A WORLD WIDE ENERGY CRISIS

*Should Europe become more energy independent?  
Should fossil fuel be eliminated entirely?  
Is hydrogen the solution and is an energy transition realistic?*

*A lot of questions and big investments pop up.*

*In the Eemshaven, The Netherlands, it was decided to focus on a more independent gas supply and own resources to distribute the energy. Large investments and a lot of manpower are deployed to build a new floating LNG-Terminal, called the EemsEnergyTerminal, to be up and running within... half a year. The terminal will increase the overall receiving capacity of the Netherlands from 12 up to 20 billion cubic meters per year. The goal is to tackle the energy shortage, to increase the number of possible suppliers and eventually to reduce the energy bill.*

*A very important link within this LNG-Terminal is the 120 m long Floating Storage Regasification Unit (FSRU). This is a floating gas factory that transforms liquid and refrigerated natural gas (LNG @-162°C) into gaseous gas under high pressure. The high pressure gas on his turn is then injected into the shore gas network.*

*The conversion from liquid to gaseous gas is a very complex process requiring a minimum of thermal energy. In summer periods the thermal energy can be subtracted from the water in port. During winter periods the FSRU switches to a thermal energy shore supply. An ingenious system regulates at all times that the minimum required amount of thermal energy is delivered to maintain the gas delivery flow rate.*



*"The collaboration with the engineering team of MULTI.engineering went very well. By tackling challenges immediately, we have managed to keep the momentum in the project."*

EXMAR



## MODIFICATIONS

Getting the FSRU fully operational at the EemsEnergy-Terminal implies that modifications were required for which EXMAR has contracted MULTI.engineering as engineering partner.

The gas discharge manifold, which serves as the connection point between the vessel and the shore has been extended and relocated from Starboard to Portside. The mooring equipment has been redesigned to be able to withstand a 100 year storm in Eemshaven and the occurring tides.

The heat energy system required for the regasification process has been extended with the functionality to receive thermal energy from shore. An electrical power connection is made with shore so no fossil fuel driven generator sets need to be used on board once shore power becomes available for the unit.



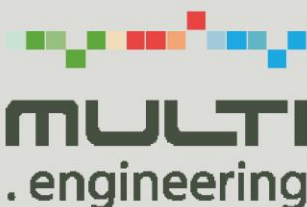
## PROJECT ENGINEERING TASKS

- Structural strength calculations and delivery of production packages for platforms with shore connection.
- Outfitting design and production package for all platforms.
- Modification of piping diagrams, Pipe stress analysis, integration of system extensions in the existing systems and delivery of production packages for new piping.
- Update of all statutory documents for class review.



## FACTS & FIGURES

- Vessel's name: Eemshaven LNG
- Floating Storage Regasification Unit (FSRU)
- Owner: EXMAR - Antwerp, Belgium
- Year of delivery: 2017
- Length: 120 m
- Deadweight: 19.510 m.tons



MULTI.engineering is an engineering company, we support customers success by offering flexible engineering solutions.  
Working with us is always a great experience!

## CONTACT US

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