



FSRU Neptune  
Image by Höegh LNG

# FSRU TERMINALS

## Independent, end-to-end technical expertise throughout the value chain

The growing availability of liquefied natural gas (LNG) is providing many coastal nations with access to the least carbon-intensive hydrocarbon. Floating storage and regasification units (FSRUs) terminals play a key role in the LNG value chain, forming the interface between LNG carriers and the local gas supply infrastructure. They are versatile, convenient and can make natural gas available to the market faster than land-based installations.

FSRU terminals are typically subject to a range of technical challenges as the interface between maritime and onshore infrastructure. To ensure cost-efficient, reliable and compliant projects and operations, working with a competent partner is a must.

### Why partner with DNV GL?

With a global network of more than 2,000 oil and gas industry experts, DNV GL provides multi-disciplinary technical expertise across the LNG value chain. Our work helps manage risks, achieve cost-efficiency, transparency and sustainability in compliance with the highest industry standards and regulation.

We have a unique heritage in the gas industry. Combining gas services from DNV, GL Noble Denton, Advantica (British Gas Research and Technology) and KEMA (Gasunie Technology), DNV GL has assisted 500 LNG clients in more than 70 countries for over 50 years. This enables us to bring a broader view in addressing your most challenging business and technology risks, making us the trusted partner in complex and large infrastructure projects.

## DNV GL's FSRU experience

With extensive experience in the global development of FSRUs and onshore terminals, we have been involved in more than 40 newbuild and conversion FSRU projects globally, incorporating pipelines, terminals and floaters. The table below shows some of DNV GL's project references.

| Project               | Country<br>(as at Oct 2018) | Classification | Verification /<br>Certification | Advisory<br>Services |
|-----------------------|-----------------------------|----------------|---------------------------------|----------------------|
| BW Integrity          | Pakistan                    | X              |                                 |                      |
| BW Singapore          | Egypt                       | X              |                                 |                      |
| EON FSRU Toscana      | Italy                       |                |                                 | X                    |
| Excelerate Excelerate | United Arab Emirates        |                |                                 | X                    |
| Excelerate Excelsior  | Trinidad and Tobago         |                |                                 | X                    |
| Exmar Excellence      | Bangladesh                  |                |                                 | X                    |
| GDF Suez Cape Ann     | Nigeria                     | X              |                                 | X                    |
| GDF Suez Neptune      | Turkey                      | X              | X                               |                      |
| Golar Eskimo          | Bangladesh                  | X              |                                 |                      |
| Golar Freeze          | Dubai                       | X              | X                               |                      |
| Golar Igloo           | Kuwait                      | X              | X                               | X                    |
| Golar Nanook          | South Korea                 | X              |                                 | X                    |
| Golar Spirit          | Greece                      | X              |                                 | X                    |
| Golar Tundra          | Egypt                       | X              |                                 |                      |
| Golar Winter          | Brazil                      | X              | X                               | X                    |
| Hoegh Esperanza       | Singapore                   | X              |                                 | X                    |
| Hoegh Gallant         | Egypt                       | X              |                                 |                      |
| Hoegh Giant           | Panama                      | X              |                                 |                      |
| Hoegh Grace           | Columbia                    | X              | X                               | X                    |
| Independent Trial     | Lithuania                   | X              |                                 |                      |
| Nusantara Regas Satu  | Indonesia                   | X              | X                               |                      |
| PNG FSRU Lampung      | Indonesia                   | X              | X                               | X                    |

## Services covering every aspect of the project lifecycle

### STRATEGY & FEASIBILITY

- Demand forecasting
- Network planning
- Concept selection
- Site selection
- Tender process assistance
- Regulatory support
- Yard assessment

### DESIGN & CONSTRUCTION

- Classification
- Construction monitoring
- Geotechnical studies
- Hydrodynamics (sloshing) analysis
- Machinery optimization
- Mooring and Navigation studies
- Owners engineer
- Safety and environmental risk
- Strength and fatigue analysis
- Technology qualification

### OPERATIONS

- Classification
- Condition Monitoring
- Asset Integrity
- Demand studies
- Due diligence
- In-service risk studies
- Maintenance planning
- Reliability studies

### CONTACTS

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