

## About LNG Marine Carriers



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**Pacific NorthWest LNG is a proposed liquefied natural gas (LNG) export facility on Lelu Island within the District of Port Edward on land administered by the Prince Rupert Port Authority. The facility, representing an investment of \$9 billion to \$11 billion, would export natural gas produced by Progress Energy Canada Ltd. in northeastern BC. Both Pacific NorthWest LNG and Progress Energy Canada are owned by PETRONAS.**  
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### **Pacific NorthWest LNG**

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## When the export facility begins operating with two LNG trains (or liquefaction plants) it is expected that about 220 LNG carriers will visit the facility each year.

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### Marine Carriers and LNG

- LNG has been safely transported to markets around the world in LNG carriers for more than 50 years
- LNG carriers are specially-designed vessels that are used only for LNG transport
- The LNG carriers are double hulled and have sophisticated safety monitoring systems to ensure that the LNG is safely handled
- All mariners onboard are trained in LNG handling
- There have been more than 135,000 LNG voyages over 50 years without major accidents, safety or security problems either in port or at sea

### LNG Carriers Servicing Pacific NorthWest LNG

There are two approaches to transporting LNG, depending on the customer contracts. The LNG will be transported to market from Pacific NorthWest LNG either via PETRONAS' own fleet of vessels or via the customers' own choice of vessels.

For all vessels, the following are some of the requirements that must be met:

- Full pre-vetting of any vessel that plans to dock at Pacific NorthWest LNG's terminal
- Full review of plans for mooring, including inspection, weather, route and safety checks by appropriate authorities
- Escort tugs will assist when the LNG carrier is approaching the terminal, berthing and departing
- Carriers must follow the Prince Rupert Port Authority's speed zone requirement to ensure there are no wave impacts
- Compliance with international, federal and local shipping requirements

- Pacific NorthWest LNG is participating in a series of marine safety studies, led by the Port Rupert Port Authority

### Safe History

- The LNG carrier industry has a long and safe record
- For example, Malaysia International Shipping Corporation (MISC), PETRONAS' LNG carrier fleet, has a 30-year track record of safe transportation
- MISC has one of the best safety records in the industry.
- As of October 2012, MISC LNG vessels have safely carried 348.5 million tonnes of LNG
- The MISC fleet vessels have called at 58 LNG receiving and 21 export terminals worldwide, including an import facility in New Brunswick
- The industry often shares carriers, therefore MISC's LNG fleet is assessed by its competitors periodically, which requires the MISC fleet to operate to best practice standards
- The most recent peer review indicated MISC's fleet to be at par with the rest of the international LNG fleets

- MISC's vessels are dry docked for major inspection and repair every 30 months, more frequently than the industry average
- The fleet has been qualified by the Malaysian Qualifications Agency, Marine Department, Malaysia, SIRIM Berhad, United Kingdom Accreditation Service and Det Norske Veritas
- Compliance audits have been done by major international organizations such as the European Maritime Safety Agency, Australian Maritime Safety Agency, Maritime Coastguard Agency UK and Norwegian Maritime Directorate

### Fueling the Vessels

- Depending on the type of vessel, they can be powered either by marine fuel or directly by LNG
- Fuel burning at sea is regulated by the International Convention for the Prevention of Pollution from Ships (MARPOL)
- MISC has modified its vessels well ahead of international guidelines to reduce emissions
- When visiting Canadian waters, MISC vessels will meet the emission standards as required by Emission Control Area (ECA) specifications

