



Port Kembla Gas Terminal



The design, construction and operation of the Port Kembla Gas Terminal (PKGT) and associated infrastructure will be carried out in accordance with all statutory requirements in Australia and NSW and stringent international, Australian and NSW safety regulations and standards.

The PKGT consists of four key components, all of which have in-built safeguards:

- Liquefied natural gas (LNG) carriers — there are hundreds of these vessels in operation transporting LNG from production facilities all around the world to demand centres.
- Floating Storage and Regasification Unit (FSRU) — a cape-class ocean-going vessel which would be moored at Berth 101 in Port Kembla. There are around 30 FSRUs in operation worldwide.
- Berth and wharf facilities – including landside offloading facilities to transfer natural gas from the FSRU into a natural gas pipeline located on shore.
- Gas pipeline – a Class 900 carbon steel high-pressure pipeline connection from the berth to the existing gas transmission network at Cringila.

LNG

LNG is natural gas, mostly composed of methane, that has been turned into a liquid by cooling it to approximately -161°C . When cooled to liquid form, the volume of gas is 1/600th of its original size which makes it much easier to transport.

LNG is odourless and colourless in liquid form. It is non-corrosive and non-toxic. As a liquid, LNG is not flammable. LNG will not pollute land or water resources and quickly vapourises when exposed to air, leaving no residue behind. LNG is not explosive if released to the atmosphere.

LNG Carriers

Both LNG carriers and FSRUs are built to very strict international design standards, including the International Maritime Organisation's Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk.

The LNG carriers visiting the PKGT would have an average capacity of around $170,000\text{m}^3$. Vessels of a similar size to these carriers currently use Port Kembla harbour.

LNG tankers are double-hulled and specially designed and constructed to prevent leakage or rupture. The LNG is stored in a special containment system within the inner hull. The design of this system also enables the LNG to stay cold, without the need for pressurisation. The absence of pressurisation further contributes to the safe transportation and storage of LNG.

LNG has been transported and handled safely for more than 60 years. Globally, the LNG industry has carried out more than 80,000 transfers and has an excellent safety record worldwide, with no serious accidents or safety problems reported in port or at sea.

The FSRU

The FSRU is similar to a LNG carrier, but is also equipped to regasify LNG on board. Although moored in port it remains a seaworthy vessel with a marine crew living on board, so it can be sailed out of port quickly if required.

The FSRU has four key functional elements:

- Facilities to receive LNG from LNG carriers
- Facilities to store LNG
- Facilities to convert LNG back into gas
- Capability to inject gas into the pipeline connection

A number of safety systems have been built into the FSRU to avoid, mitigate and manage hazardous events. These include: fire and gas leak detection systems; isolation and shutdown systems – both automatic and manually initiated; LNG drainage systems and fire protection and fire-fighting systems. Evacuation and rescue systems, procedures and protocols will be in place in the unlikely event of an emergency.

Construction of the PKGT's FSRU, the Höegh Galleon, was completed in mid-2019. Höegh LNG, the designer and operator of the Galleon, is a Norwegian company and world leader in the development of FSRUs. Höegh vessels make up one third of the global FSRU fleet and Höegh LNG has an established safety management system with a strong safety record.

Berth and wharf facilities

Fire and gas leak detection systems will also be in place throughout the onshore handling facilities. In addition, automatic release, shutdown and isolation systems in the offloading arms would activate in the event of any abnormality detected in operations. The speed of these systems is effectively instantaneous.

Onshore pipeline connection

A short pipeline about 6.5 kilometres long will be constructed to connect Berth 101 to the existing gas transmission network at Cringila. The 18 inch pipeline will run largely through industrial land around the Port and will be designed to fully comply with the Australian Pipeline Code AS2885 and all environmental and safety requirements. AIE's new pipeline will be similar to other gas pipelines currently operating in the local area.

Terminal Safety

Preparation of the Environmental Impact Statement (EIS) for the PKGT included a comprehensive hazard and risk analysis.

The assessment found that risk to people or property in sensitive areas, residential areas or commercial areas was very low and complied with the NSW Department of Planning's stringent risk thresholds. Risk at adjacent industrial areas or open land was also assessed to be low given the low probability of a hazard event occurring.

In addition to the various safety features that would be built into the project, a comprehensive safety management case for the PKGT will be required to be developed and then need separate approval from SafeWork NSW.

AIE will also continue to work closely with the Port Authority and NSW Ports throughout the Terminal's operation to ensure the facilities do not impact the safe operations of other port users.

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