

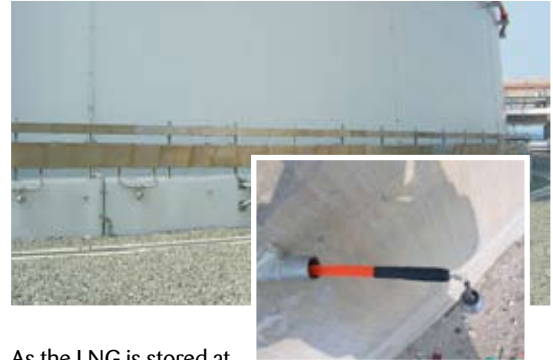


PRODUCT / APPLICATION INFORMATION

LNG Production and Storage Facilities

It is estimated that by 2020, gas will supply about 25% of the global energy demand and with the benefit of being a relatively clean fuel, this percentage will further increase. As many of the world gas reserves are geographically isolated from the market, LNG (Liquified Natural Gas) will play a major role in the efficient delivery of energy to the end user.

The production of LNG by conversion of natural gas to liquid is done in a series of processes that are commonly known as "gas trains". During these processes the gas is cleaned and dried, liquefied by cooling to -160°C and stored in large LNG storage tanks ready for pumping to LNG Tankers.



Foundation Heating for Refrigerated Storage Tanks

LNG is stored in large insulated atmospheric pressure storage tanks. As the LNG is stored at -160°C, the foundation slab requires heating to prevent frostheave and potential foundation buckling due to an ice lens formation, resulting in potential destruction of the tank. Other typical cryogenic products that also require slab heating are Butane and Propane.

Given the critical nature of this application Thermon uses 3D FEA analysis to provide a comprehensive design that includes edge effects. Heater cable is placed in conduit in the foundation slab providing uniform heat across the tank base and circumferentially in the ring walls as required. Thermon can also advise on the appropriate control and monitoring system. Recommended heat tracing system: [FP constant watt heating cable](#) or [RSX self regulating heating cable](#), both with RTD control.

Gas Sampling and Instrument Impulse Lines

Process and analytical analysers require the sampling tubing to be heated above the process or dew point of the specific gas to ensure the sample reaches the analyser at the desired elevated temperature. Pre-insulated heated tubing bundles include tube, heater cable, thermal insulation and outer jacket as a combined custom product called [TubeTrace](#)®. TubeTrace provides an efficient and cost effective solution to heat trace small OD tubing. Recommended heat tracing system: TubeTrace with customer specified tubing type and [BSX](#) or [HTSX](#) self regulating heating cable and thermostat control.

Process Temperature Maintenance

Process and dew point maintenance for a variety of products transferred in pipelines within the plant. Typical products requiring electric heat tracing are oxazolidone, waste vent gas, buffer gas and gas metering. Recommended heat tracing system: [HTSX self regulating heating cable](#) or if higher maintain temperatures are required [HPT power limiting heater cable](#) or [MIQ mineral insulated heater cable](#).

Electric Heat Tracing Standards and Codes

Thermon heat tracing products are tested and certified by major approval agencies to international industry standards.

LNG projects completed by Thermon worldwide.

EPC	Owner	Location	Project
KJK	Woodside Petroleum	Australia	Gas Trains 1-2,4
FW	Woodside Petroleum	Australia	Gas Trains 5
JGC-	KMSB-SIME MLNG	Malaysia	Gas Train 3
MHI	Sempra Energy	Mexico	LNG Tanks
CBI-	USA Shell Hazira	Nigeria	LNG Tanks
Chiyoda-	Snarmprogetti Ras Laffan	Qatar	Gas Train
Saipem	SA Cartagena	Spain	LNG Tanks
Techimont	ICB Shell	India	LNG Tanks
Daelim-	Skanska Korean Gas/POSCO Korea		LNG Tanks

Note . . .

This is only a partial list. Contact Thermon for a more comprehensive listing of completed and ongoing projects around the world.

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