INPROHEAT INDUSTRIES LTD.

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# SubCom® Case Study: Sea Water Heating for LNG Vaporizer Project

**Company:** Confidential

**Location:** Europe

**Year Completed:** 2013

**Deliverables:** Sea Water Heater for LNG Regasification

## Project Overview

Recent demand for cleaner burning fuels driven by emission standards has dramatically accelerated the growth of the liquefied natural gas industry globally.

An LNG terminal in Europe was expanding its capacity to regasify LNG and distribute the natural gas to western Europe. Adopting Open Rack Vaporizer (ORV) technology for the expansion phase, sea water from the North Sea was to be used to provide the necessary heat for the regasification process. The process demands 7,000 m3/h of sea water to be pumped over the ORV's at a minimum temperature of 6°C to meet the heat input requirements. During the winter months, the sea water temperatures can fall below this critical value.

In order to maintain full production capacity year-round the sea water must be heated. Based on proven experience of heating corrosive liquids and high thermal efficiencies, a SubCom® heating system manufactured by Inproheat Industries was selected by the terminal owners for this project.

## The Challenge

Handling corrosive liquids such as sea water presents materials of construction challenges, as did heating a large flow of water. In addition to the process challenges, the system had to comply with stringent European emissions regulations.

Past projects by Inproheat involving the heating of industrial brine in the potash and oil and gas industries provided a long history of treating corrosive solutions with SubCom® equipment.

Up until this time, Inproheat had employed burners with a capacity limitation of 16 MM Btu/h. The peak capacity needed for the ORV's would require a large number of burners and there was a mandate to minimize the number. Inproheat undertook to utilize a burner design with five times the capacity that also offered low emissions to meet the regulatory standards.

The owner wanted to install the SubCom® burner system into a concrete tank, introducing challenges to engineering a gas-tight tank – burner assembly.

A system had to be devised to handle the large volume of water to be heated.

## The Solution

In order to achieve the target sea water temperature, it was determined that a gross heat input capacity of 35 MW (120 MMBtu/h) was needed. Inproheat adopted the use of two 16" Maxon Kinedizer LE burners to be fired at 60 MM Btu/h each.

To heat the entire 7,000 m3/h of sea water to the desired temperature, a slipstream of the main flow was diverted to the SubCom® heating tank and heated to a temperature which would result, when the heated stream was re-blended into the main stream, result in the target temperature to the ORV's. The control strategy for control of the heating and management of flow into the heating tank and re-injection into the water supply line to the ORV's was developed and implemented by the Inproheat team.

The inlet GRP piping and flow control into the heating tank, and re-injection pumps and piping were included in Inproheat's scope of supply. The water inlet and outlet facilities have parallel spares to ensure high availability.

The system met the performance test for capacity and the emissions tests.

For Inproheat Industries, the process from challenge to solution represents another example of how the company uses its core philosophy as "people helping people" and its globally-recognized SubCom® technology to lead the way as a total solutions provider.

## REQUEST INFORMATION:

**Inproheat Industries Ltd.**
1-888-684-6776 / (604) 254-0461
info@inproheat.com