

TURRET BUOY ANTI-ICING SYSTEM

SRL silicone rubber heating blankets provide energy-efficient solution for oil transport

Application

Large turret buoys are used in shallow and deep-water environments for loading and unloading fluids between tankers and storage facilities on the shore. An existing buoy off the coast of Saint John, New Brunswick on the Bay of Fundy is exposed to temperatures as low as -32°C (-25°F). Ice forming on the outside of the buoy limited use and created safety concerns. Monobuoy was awarded a contract to install their TU-1200 buoy, a 12-meter catenary anchor-leg mooring (CALM) as a replacement. This buoy is capable of servicing tankers up to 400,000 dead-weight tons (DWT) and pump up to 75,000 barrels per hour (BPH) of liquids such as crude oil, refined oils, or other fluids. The customer required the buoy have heaters to prevent ice from forming on the exterior surfaces, and required a 30-year life expectancy.

Solution

BriskHeat® was asked to supply surface heating for the buoy with a surface area of 350 m^2 ($3,767\text{ ft}^2$). Engineers recommended the total heat requirement to be just over 350 kW based on the temperature extreme and wind speed. Insulating the interior surface of the heaters mounted to the cold exterior walls could result in condensation, so no insulation would be installed. Additional heat loss was considered as part of the solution offered. This "lost heat" helped to warm the inside of the buoy creating a more comfortable environment for personnel during use.

BriskHeat's SRL Silicone Rubber Heating Blankets were selected as they are designed to be used on metal surfaces and have a watt density of 0.39 w/cm^2 (2.5 w/in^2). They have 20 mil fiberglass material on each side of the heating element as reinforcement to the silicone sheets. SRL blankets are moisture and chemical resistant to protect from condensation or in the event of leaks. These features provide the extra durability required to meet the end-users service life needs. The SRL-ADJ version includes a built-in temperature controller with thermostat to adjust the heaters if necessary.

Ease of installation and replacement was another requirement of the solution. Each heater included peel-and-stick, pressure-sensitive adhesive which is available on most BriskHeat® silicone heaters. For easy access to wiring, junction boxes were used to create heating zones with multiple heaters controlled with a single sensor.



First tanker using the TU-1200 in Eastern Canada



Older ice-covered buoy



Dive room showing custom SRL-ADJ heating blanket with built-in control



SRL-ADJ heating blanket with built-in control

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