ARCTIC OFFSHORE AND MARITIME
HEATING SOLUTIONS

THERMON The Heat Tracing Specialists®
TRACE HEATING SOLUTIONS FOR ARCTIC OFFSHORE AND MARITIME

- Offshore Oil and Gas Platforms
- Arctic Rigs
- FPSO’s, FSO’s, FLNG’s and FPU’s
- FLNG Carriers
- Oil Tankers
- Support Vessels
- Ice Breakers
- Research Vessels
- Supply Vessels
EXPLORATION AND PRODUCTION

In the 21st century a major increase in demand is changing the global energy market. In order to meet the demand, the international oil and gas industry is exploring the globe in search of new energy resources to meet the required energy supply. Oil and gas exploration companies are being challenged to provide highly technical and environmentally sensitive solutions.

The Arctic region containing a large part of world’s ‘undiscovered’ oil and gas resources. However, exploration and production in the Arctic, where companies and humans are faced with extreme temperatures down to -60°C, is going to be a difficult undertaking.

HARSH ENVIRONMENT

In the high north arctic and polar regions the extreme low ambient temperatures and high winds create snow and ice conditions that require unique operational considerations.

Thermon provides solutions for freeze protection, temperature maintenance and snow and ice melting systems on arctic vessels and structures. These systems create a safe working environment to ensure the safety of personnel and the operation. With over 60 years in the trace heating industry, Thermon is a proven leader in providing heating solutions for offshore and maritime applications.
In polar and Arctic environments ice formation on exposed surfaces creates serious problems impacting the safety of personnel and operations. The ice formation can be caused by sea spray and/or snow, rain and fog with the low ambient temperature. Thermon has developed anti-icing and de-icing solutions for offshore support and supply vessels, icebreakers, semi-submersible drill ships and platforms.

The trace heating systems are designed to ensure that all pipes, vessels, instruments and equipment are adequately protected for operations in low temperatures with cold sea water and high wind.

Four design philosophies apply:

- **Anti-icing**: ice and freeze prevention where surfaces will be maintained above freezing under the ‘worst case’ ambient design conditions.
- **De-icing**: removal of accreted ice in a reasonable and defined period of time.
- **Winterization**: anti-freeze for piping, valves, instruments and equipment containing fluids.
- **Process temperature maintenance**: temperature maintenance of piping, valves, instruments and equipment.

### STAIRS
Heat trace for anti-icing or de-icing of stairs is installed underneath each step.

### DOOR SEALS
Water tight doors require sufficient heat to prevent icing of the seals.

### HATCHES
Heat trace is required to prevent icing at seals to allow hatch to open as required.
Thermon trace heating **SOLUTIONS** are specifically designed to provide a safe work environment for platforms, escape ways and helidecks. With over 60 years experience in the heat tracing industry, Thermon will evaluate each design and provide a complete heating system.

**HELIDECKS**
Anti-icing or de-icing of helicopter decks can also be required. Different deck designs and materials of construction can require Thermon to evaluate each design to ensure adequate heat and reliable performance.

**PLATFORMS AND WALKWAYS**
Heat trace can be required for anti-icing or de-icing for personnel safety.

**LIFEBOAT STATIONS**
Heat trace is required to provide safety of personnel at muster stations.

Anti-icing and de-icing systems can be designed and installed “on deck” or “under deck” with thermal insulation. Thermon has experience with both types of systems.
Typical needs for trace heating on FPSO’s and FSO’s are deck lines for oil, chemical products. Thermon has designed trace heating systems for freeze protection and temperature maintenance of:

- Loading and unloading lines
- Gas/vapour-return lines
- Strip and cleaning lines
- Fuel oil lines
- Storage tanks and vessels
- Deck and tank cleaning lines
- Fire protection lines
- Engine room fuel and drip lines
- Cross-over lines
- Manifolds
- Safety showers

**ENGINEERING AND PROJECT MANAGEMENT**

Thermon provides experienced engineering and project management services. Thermon Engineering evaluates heat loss predictions from heat transfer models to establish thermal loads via Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD) to confirm temperature distribution. Thermon provides an optimized thermal design with a suitable electrical load balance.

CFD is used to determine the impact of wind on heat loss from uninsulated surfaces to be kept free of snow and ice.
THERMON PRODUCTS

Thermon has developed a sustainable and reliable comprehensive range of products for the extreme environmental conditions of offshore support and supply vessels, icebreakers, semi-submersible drill ships and platforms. All products are manufactured by Thermon in compliance with international industry standards and carry approvals for installation and operation in hazardous (classified) areas.

CONTROLS AND MONITORING

Critical heat tracing applications warrant increased monitoring and surveillance. Controlling and monitoring the heat tracing system from a central location is particularly important for large scale EHT (electric heat tracing) systems and invites energy management.

Thermon control and monitoring systems are developed specifically for the lowest overall cost of ownership including maintenance and operations.

CODES AND STANDARDS

Thermon is working with various classification societies to develop solutions that will comply with the upcoming IMO Polar Code.

Thermon Heat Tracing Systems are tested and listed with numerous approvals agencies and shipping comply with IEEE515, IEC60079-30 industrial trace heating standards.
Thermon Supplies Heat Tracing Products and Services for Offshore Oil and Gas Projects Worldwide

SEVAN Marine ASA
BW Offshore
COSL
Eni Saipem
JX Nippon Oil Energy Corporation
Esso
Origin Energy
CLJO
Premier Oil
HOANG LONG JOC
Subsea 7
SINOPEC
Maersk Oil
Skeie Drilling & Production
Pertamina Patra Niaga
Petronas
Daewoo
The Monobuoy Co
Talisman Energy
Prosafe
PTTPE
Bluewater Energy
Maersk Drilling
CNOOC
Tate & Lyle
Anzon Energy Ltd
Petrodar Operation Company
Devon
AETPL
JVPC
Vanguard Energy Corp
Occidental Petroleum Corp.
SBM Offshore
Vietsovpetro
Shell Oil Company
Santa Fe Petroleum Inc.
ABB Oil & Gas
Aker Solutions
The Hess Corporation
Amoco Corporation
ARCO
BHP Billiton Ltd.
BP
Statoil
Britannia Operator Ltd
British Gas
ConocoPhillips
ExxonMobil
Hamilton Company
Heerema Group
Kerr-McGee
FMC Corp
Kraerner ASA
Hydro
ONGC India
Phillips 66
Sakhalin Energy
Smedvig ASA
Sovereign Oil & Gas
Stena Drilling
Texaco
Vageri
Woodside Petroleum Ltd.
KNOT Offshore Partners LP
Dynagas Ltd.
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