CONNECT AND PROTECT

SULFUR TRANSPORT PIPELINE
Safe, Reliable and Cost-Effective Heat Management System
INDUSTRIAL SOLUTIONS

As the world’s largest provider of complete electrical heat management systems, primarily for the general process, oil and gas, chemical, and power generation industries, nVent provides innovative products and turnkey solutions under market-leading brands—RAYCHEM, PYROTENAX, RAYCHEM, and TRACER. Our premiere turnkey solutions include full life cycle support—ranging from front-end engineering and installation to maintenance and operation services. Our global experience and office presence in 48 countries uniquely position us to manage the heat needed for projects of any size and scope.

THE HEART OF OUR SOLUTIONS

nVent RAYCHEM STS Skin Effect Heating technology is a unique and most effective heat-tracing option for heated sulfur pipelines. nVent has successfully integrated multiple state-of-the-art technologies in a Heat Management System to offer safe, reliable and cost effective sulfur transport. Our Heat Management System (HMS) for sulfur transfer pipeline includes RAYCHEM Skin-Effect Heat-Tracing System, customized insulation and power distribution systems, Finite Element Analysis, CFD Analysis and Fiber-Optic Distributed Temperature Sensing.

Our proprietary sulphur re-melt program for sulfur pipelines has proven to be the safest and most reliable approach to the critical issue of re-melting solidified sulfur without compromising the integrity of the pipeline. The introduction of “Bundled Technologies” in sulfur re-melt application basically eliminated the pipeline failures during sulfur re-melt.

SAFE SULFUR TRANSPORT

With the increasing use of heavy crude, safe sulfur transportation is becoming increasingly important for the refining industry. Sulfur transport via heated pipelines is a viable alternative to transporting liquid sulfur by trucks over public roadways. This application has unique requirements due to the limited operating temperature range for liquid sulfur, pipe expansion and overheating concerns during re-melting of sulfur in the pipeline.

Our unique Heat Management System combined with proven experience in engineering, procurement, construction and commissioning of sulfur pipelines often accompanies an “Enforceable Warm Pipe Warranty”—the best in the industry.
A Heat Management System (HMS) is an engineered system designed to maintain or protect process piping, equipment, vessels and instrumentation at pre-determined temperatures and within the defined design criteria. Our HMS for sulfur transport pipelines includes: Engineering & Design, Procurement & Fabrication, and Construction Services.

By implementing nVent HMS, customers have realized more reliable, safe and cost effective solutions for sulfur transport pipelines as compared to other technologies. A list of existing customers is available upon request.

**ENGINEERING & DESIGN**

- Skin-Effect Heat-Tracing Technology
- 3D Finite Element Analysis
- CFD Analysis
- Transient Analysis
- Fiber-Optic Distributed Temperature Sensing
- Detailed System Optimization
- Proprietary Field Thermal Insulation Joint Design

**PROCUREMENT & FABRICATION**

- Prefabricated and Pre-insulated Piping System
- Customized Power Distribution
- Multi-Power Heat Delivery Mechanism
- Control and Monitoring System
- Thermal Insulation
- Fiber-Optic DTS System

**CONSTRUCTION SERVICES**

- Installation
- Materials Management
- Project Controls
- Commissioning and Start-up
- Field Co-ordination
- Quality Assurance/Quality Control (QA/QC)
- Maintenance/Audits
The RAYCHEM Skin-Effect Heat-Tracing System (STS) is a versatile engineered heat management system configured to deliver heat for long pipeline applications. The system can generate significantly higher wattages and is inherently safe.

**CAPABILITIES**

- Circuit lengths up to 25 km (15 miles) from a single source
- Maintain temperatures up to 200°C (392°F) and exposure temperatures up to 250°C (482°F)
- Power outputs up to 150 W/m (45.7 W/ft)
- Inherently safe design—outside of the heat tube or carrier pipe at ground potential
- Efficient heat transfer from the heat tube to the pipe
- Can be provided as a pre-fabricated and pre-insulated piping system

**BENEFITS**

- Minimizes power distribution costs, especially for long sulfur lines
- Results in a safe and reliable heat management system
- Reduces the risk of hot spots throughout the re-melt or solidification process during normal operation
- Reduces on-site total installation costs
nVent has proven expertise in designing customized insulation and power distribution systems. Our systems are optimized to meet the challenging requirement of sulfur transport pipelines.

**CAPABILITIES**

- Multi-layer thermal insulation system with high temperature inner layer, load bearing outer layer, and UV resistant outer jacket
- Engineered pipe supports, guide plates and anchors to support the pipe load to minimize heat loss
- Multi-power heat delivery mechanism with additional power for heat-up/re-melt conditions
- Custom solution transformers designed to meet specific project requirements

**BENEFITS**

- Optimizes heat loss, protects against water ingress and natural elements, and able to handle large loads
- Minimizes operating costs with capacity to handle heat-up/re-melt power requirements
- Delivers a flexible operating voltage required for re-melt conditions
3D Finite Element Analysis is an integral part of nVent sulfur transport pipeline heat management system.

**CAPABILITIES**

- Simulate the temperature profile of sulfur across the cross section of the pipe
- Determine the heat-up or cool-down characteristics of the sulfur line through transient analysis
- Simulate the temperature profile along the length of pipe

**BENEFITS**

- Ensures that sulfur temperature does not fall below the solidification temperature across the cross section of the pipe
- Determines the time available before the sulfur solidifies due to power failure under varying ambient conditions
- Analyzes hot spots and voids throughout the sulfur re-melt process
Fiber-Optic Distributed Temperature Sensing

nVent has a proven track record of implementing distributed fiber-optic temperature sensing solutions which provide critical insight into the temperature profile along the entire length of pipe.

CAPABILITIES

• Temperature profile with 1°C accuracy and 1 m resolution along the length of the pipeline
• Capable of sensing temperatures for up to 20 km (12.5 miles) of pipeline from each station

BENEFITS FOR SULFUR TRANSPORT PIPELINES

• Prevents pipe damage during re-melting of solidified sulfur by precisely locating hotspots or voids along the entire length of the pipeline
• Senses temperature for long sulfur transport pipelines with multiple flow paths
• Facilitates the commissioning process by pinpointing the locations of inadequate, absent, or damaged insulation along the entire length of the pipeline

Contact a nVent Expert today for your sulfur transport needs at PTM-techsupport@nvent.com.