Sulfur Transport Pipelines
Safe, Reliable and Cost-Effective Heat Management System
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 temperature range for liquid sulfur, pipe expansion and overheating concerns during re-melting of sulfur in the pipeline.

Unique Heat Management Solution

Tyco Thermal Controls 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 Tracer® Skin-Effect Heat Tracing System, Customized Insulation and Power distribution systems, Finite Element Analysis and Fiber-Optic Distributed Temperature Sensing. This unique heat management system is combined with proven experience in engineering, procurement, construction and commissioning of sulfur pipelines.
Heat Management System

A Heat Management System (HMS) is an engineered system designed to maintain or protect process piping, equipment, vessels and instrumentation at predetermined temperatures and within the defined design criteria. Our HMS for sulfur transport pipelines includes: Engineering & Design, Procurement & Fabrication, and Construction Services.

By implementing Tyco Thermal Controls’ 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 Heating Tracing Technology
- 3D Finite Element Analysis
- Transient Analysis
- Fiber-Optic Distributed Temperature Sensing
- Detailed System Optimization

**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 Tracer® STS system 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 heat tube to the pipe
- Can be provided as a pre-fabricated and pre-insulated piping system

**Benefits for Sulfur Transport Pipelines**

- Minimizes power distribution costs, especially for long sulfur lines
- Results in safe and reliable heat management system
- Reduces risk of hot spots during re-melt or solidification during normal operation
- Reduces on-site total installation costs
Tyco Thermal Controls 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 carry pipe load to minimize heat loss
- Multi-power heat delivery mechanism with additional power for heat-up/re-melt conditions
- Custom manufactured transformers

**Benefits for Sulfur Transport Pipelines**
- 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
- Enables flexible operating voltage required for re-melt condition
3D Finite Element Analysis is an integral part of Tyco Thermal Controls’ sulfur transport pipelines 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 sulfur line through transient analysis
- Simulate the temperature profile along the length of pipe

**Benefits for Sulfur Transport Pipelines**
- Ensures that sulfur temperature is not below the solidification temperature across the cross section of the pipe
- Determines the time available before the sulfur solidifies due to power failure under different ambient conditions
- Analyzes hot spots and voids during re-melt conditions
Fiber-Optic Distributed Temperature Sensing

Tyco Thermal Controls has a proven track record of implementing distributed fiber-optic temperature sensing solution that provides incredible 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 60 km (37 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 length of pipe
- Senses temperature for long sulfur transport pipelines with multiple flow paths
- Helps during commissioning by pinpointing the locations of inadequate or absent insulation along the length of pipe

Contact Tyco Thermal Controls Heat Management System Expert today for your sulfur transport needs at techsupport@tycothermal.com.
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