



## Project Profile – Qatargas Sulfur Transfer Line

*With decades of experience in designing, manufacturing and installing heat management systems, Tyco Thermal Controls has satisfied the unique requirements of various applications.*

### Project Description

- ❑ **Client:** Qatargas
- ❑ **Location:** Ras Laffan, Qatar
- ❑ **Application:** 12” Sulfur Transfer Pipeline
- ❑ **Technology:** Skin-effect Tracing System, Fiber-optic Distributed Temperature Sensing, FEA 3D Modeling
- ❑ **Date Initiated / Completed:** December 2005 / May 2009
- ❑ **Contract Scope:** Design, Specification, Engineering, Procurement, Construction, Commissioning



### Project Details

This project consisted of a 35 km, dual, 12-inch sulfur pipeline constructed to transfer molten sulfur from 11 producers to a sulfur pelletizer facility. Heat management system challenges included:

- Tight range of allowable temperature from 125°C to 145°C for molten sulfur with a set point of 135°C along the entire length of pipeline.
- Outdoor large pipeline with significant weight, multiple flow paths, and vertical expansion loops at every 150 m.
- Capability to re-melt and re-heat solidified sulfur without causing overheating or over-expansion.
- A 100% redundant heating system for the pipeline.

### Tyco Thermal Controls Solutions

To meet the needs of this challenging application, Tyco Thermal Controls employed the following heat management system:

- Inherently safe Tracer Skin-effect Tracing System which has high exposure temperatures and efficient heat transfer to the pipe.
- State-of-the-art DigiTrace® control and monitoring system with vacuum contactors.
- Finite element analysis to determine the temperature profile of sulfur across the cross-section of the pipe.
- Fiber-optic based distributed temperature sensing system that provides dynamic pipeline temperature profile at each meter with 1°C accuracy for the entire length.

*Sulfur transfer pipeline is an example where, by strategically integrating various state-of-the-art technologies with construction and commissioning services, Tyco Thermal Controls provides turn-key solution resulting in a safe, reliable and efficient electrically traced Sulfur transfer pipeline.*





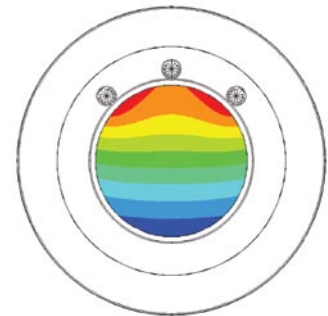
- Multi-power heat delivery mechanism with 70% of installed power for normal operating conditions and 100% of installed power for heat-up/re-melt conditions.
- Multi-layer thermal insulation system with high temperature expanded perlite inner layer, load bearing closed cell foam outer layer and UV resistant jacket.
- Full service procurement of materials, project management, construction and commissioning of the pipeline.

**Benefits**

Tyco Thermal Controls' ability to engineer and integrate multiple technologies with its expertise in construction and commissioning heat management systems resulted in a world-class, safe, reliable, and efficient electrically traced sulfur pipeline.

By utilizing a Tyco Thermal Controls Heat Management System, the Qatargas Sulfur Transfer Line received the following benefits:

- The Tracer Skin-effect Tracing System not only minimized the number of circuits but also resulted in better heat transfer and low temperature differential between the pipe and cable sheath, thus leading to a safer design.
- The finite element analysis and DigiTrace control and monitoring solutions ensured that the sulfur temperatures did not go outside the tight control temperature range under normal operating conditions.
- The fiber-optic distributed temperature sensing system provided continuous monitoring of the temperature along the entire length of the pipe. This helped to locate hotspots along the length of pipe during the re-melting process and in turn avoided excessive pressure generated by melting sulfur.
- Multi-power heat delivery mechanism and multi-layer insulation systems not only optimized the total operating costs of the system but also contributed to a shorter re-melt duration.
- By assuming total responsibility of the heat management system, Tyco Thermal Controls ensured that the project was completed on time, safely and to the satisfaction of the customer.



*Fiber-optic control panel*



*Tyco, Tracer, DigiTrace and We manage the heat you need are trademarks of Tyco Thermal Controls LLC or its affiliates.*

**Worldwide Headquarters**  
**Tyco Thermal Controls**  
307 Constitution Drive  
Menlo Park, CA 94025-1164  
USA  
Tel: (800) 545-6258  
Tel: (650) 216-1526  
Fax: (800) 527-5703  
Fax: (650) 474-7711  
info@tycothermal.com  
[www.tycothermal.com](http://www.tycothermal.com)

*Important: All information, including illustrations, is believed to be reliable. Users, however, should independently evaluate the suitability of each product for their particular application. Tyco Thermal Controls makes no warranties as to the accuracy or completeness of the information, and disclaims any liability regarding its use. Tyco Thermal Controls' only obligations are those in the Tyco Thermal Controls Standard Terms and Conditions of Sale for this product, and in no case will Tyco Thermal Controls or its distributors be liable for any incidental, indirect, or consequential damages arising from the sale, resale, use, or misuse of the product. Specifications are subject to change without notice. In addition, Tyco Thermal Controls reserves the right to make changes—without notification to Buyer—to processing or materials that do not affect compliance with any applicable specification.*