PROJECT CASE STUDY

Crude Oil Delivery System — Saudi Cement Plant, Hofouf

Location	Hofouf, Kingdom of Saudi Arabia
End Client	Saudi Cement Company
In Association With	Khatib & Alami
Duration	3 years
Role	DBSP, Preliminary and Detailed Engineering Design, Construction Support
Scope	Crude Oil Delivery System: 35 km 8" pipeline, custody transfer metering, scraper traps, control room, leak detection

PROJECT BACKGROUND

Saudi Cement Company operates one of the principal cement production complexes in the Eastern Province of the Kingdom. The plant relies on a continuous, secure crude oil supply as the primary thermal fuel for its kilns. The project objective was to design and deliver a dedicated long-distance crude oil delivery system that would supply the plant reliably, accurately, and safely — with full custody transfer accountability, integrated leak detection, and pigging capability for ongoing pipeline integrity management.

SCOPE OF SERVICES

- **Design Basis Scoping Paper (DBSP)** — prepared the foundational engineering document defining functional requirements, design conditions, codes and standards, interfaces, and the philosophy for control, metering, safety, and leak detection.
- **Preliminary and Detailed Design** — full multidisciplinary design of the 35 km, 8-inch diameter crude oil pipeline, the custody transfer metering station, the scraper trap launcher and receiver facilities, the control room, and the leak detection system.
- **Bid and Procurement Support** — preparation of scope of work, bid documents, and material requisitions; provided technical bid evaluation support.
- **Specialist Studies Coordination** — coordinated the Risk Assessment, HAZOP, Environmental Impact Assessment, and Hydraulic Analysis studies required to validate the design.
- **Construction Support, Commissioning and Startup** — provided technical support during construction and coordinated commissioning and startup activities through to operational handover.

KEY ENGINEERING ELEMENTS

- **35 km Cross-Country Pipeline (8")** — routed, designed, and specified for long-term crude oil service, with all associated mechanical, structural, civil, and corrosion-protection engineering.
- **Custody Transfer Metering Station** — engineered to the accuracy and reliability standards required for commercial custody transfer of crude oil between supplier and end user.
- **Scraper Trap Launcher and Receiver** — full pigging facilities to support ongoing pipeline cleaning, integrity inspection, and operational maintenance.

• **Control Room** — centralised supervisory control and monitoring of the pipeline, the metering station, and the leak detection system.

• **Leak Detection System** — pipeline integrity monitoring designed to deliver early detection of leaks across the full 35 km route.

OUTCOMES

• Delivered a complete crude oil supply solution from concept through DBSP, design, procurement, construction support, and commissioning — under a single integrated engineering programme.

• Embedded specialist studies (Risk Assessment, HAZOP, Environmental Impact, Hydraulic Analysis) into the design process to validate safety, environmental compliance, and operability before construction.

• Secured the plant's long-term primary fuel supply with custody transfer accuracy, pigging-capable integrity management, and continuous leak detection.

DISCIPLINES COVERED

Process • Mechanical • Piping • Pipeline Engineering • Instrumentation and Control • Electrical • Custody Transfer Metering • Pipeline Integrity and Leak Detection • HSE Studies (Risk Assessment, HAZOP, EIA, Hydraulics)
