

SHAH DENIZ 2 PROJECT – SHAWCOR APPROACH TO HSE

At Shawcor, the safety of our workforce is our top priority and responsibility. We believe there is a safe way to perform every job, and we practice effective teamwork, communication and risk identification to prevent injury. Our risk-based approach to safety ensures all hazards are identified and assessed for risk, and that appropriate controls are put into place to prevent harm. The Shawcor Health, Safety and Environment Management System is based on OSHAS 18001:2007 Occupational Health and Safety Management Systems, ISO 19011:2002 Guidelines for Quality and/or Environmental Management Systems Auditing, and ISO 31010:2009 Risk Assessment Techniques. Shawcor facilities adhere to ISO 14001:2004 Environmental Management Systems requirements.

From pipeline services to full operational protection, Shawcor approaches every operation practicing our strong core values based on the fundamentals of integrity, innovative growth and flawless execution. Shawcor’s well-established foundation is built upon our dedicated commitment to health, safety and the environment.

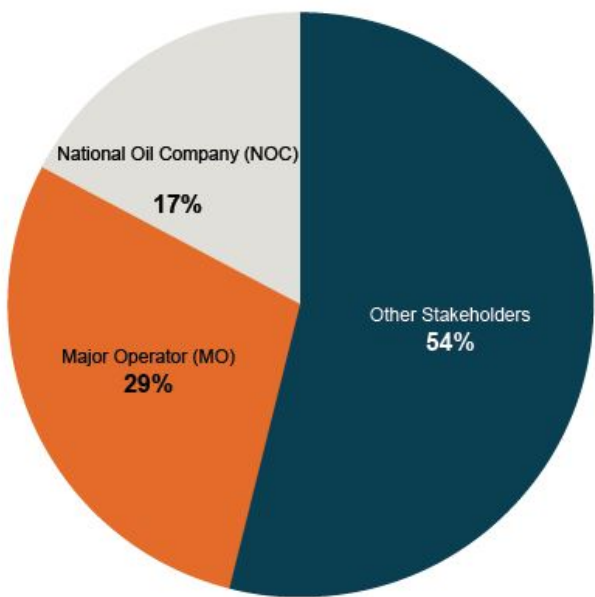
Project Description: The Total Scope

- **Shah Deniz 2 is one of the largest gas developments in the world.** Largest natural gas field in Azerbaijan, based in Caspian Sea; depth of 6000 meters and area of approximately 860 sq. kilometers
- **Significant project to increase European energy security.** Shah Deniz 2 will add an additional 16 billion cubic meter per year (bcma) of gas production to the approximately 9 bcma produced by Shah Deniz 1
- **Primary Major Operator’s (MO) Largest project in the world**

SCOPE OF WORK FOR SHAWCOR’S PIPELINE PERFORMANCE GROUP:

Shawcor provided various types of pipe coating services for more than 900 KMs of pipeline extending from Azerbaijan to Central Europe from various pipe coating facilities across the globe.

Shah Deniz Stakeholders



A wide range of pipe coating technologies including anti-corrosion, thermal insulation, concrete weight and flow assurance was provided from Shawcor's facilities in Norway, Scotland, United Arab Emirates, and Indonesia. In addition, a major mobilization and upgrade program was implemented by Shawcor in Azerbaijan (Baku) to operate and execute the largest scope of work for the facility owned by the local National Oil Company (NOC) and operated by Caspian Pipe Coaters (CPC), the sub-contractor.

Shawcor's global footprint, operating experience and expertise in various geographies, extensive technical capabilities, robust health, safety and environment and operational management systems were key factors in meeting and exceeding the stakeholders' project requirements and expectations.

- 492km of Anti-corrosion coating for the South Caucasus Pipeline expansion, onshore pipeline
- 348 km of Concrete weight coating and anti-corrosion coating for the Shah Deniz 2, subsea pipeline coating for the export line
- 116 km of Flow assurance coating Shah Deniz 2, subsea pipeline coating on flow lines
- 33,000 field joints were protected by [Canusa-CPS field-applied coatings](#)



[1] Major Operator (MO) and National Oil Company (NOC) are used to reference our clients to maintain anonymity.

ENSURING CONTINUITY OF HSE ON A COMPLEX PROJECT

Health, safety and environmental commitment is at the foundation of everything we do at Shawcor. Although this discipline is the underlying framework of work ethics, every project comes with unique challenges and new objectives, as was the case for this project.

The biggest challenge within the entire scope of Shah Deniz 2 was to ensure the continuity of HSE performance across all of the established sites and during mobilizations and throughout operation of a facility previously unknown to Shawcor. This required the implementation of Shawcor's HSE standards, where required. Shawcor leveraged its corporate HSE standard for the Baku mobilized site by providing operating practices in compliance with management procedures and in accordance with relevant standards.

In an effort to minimize all risks, actions on processes were performed to fulfil client requests. Replacing undesirable chemicals within the operations and eliminating hand-pipe contact were successfully administered. Throughout the project, factors that impact environment were carefully considered, in an effort to minimize the overall project footprint.

Shawcor took responsibility to reinforce our safety culture and renew our commitment to being recordable incident free. This process started with risk assessments and reviewing existing procedures. Shawcor's operators were well trained and aware of safety during all activities. Our recordable incident free mind-set that we introduced years ago, was refreshed with the teams. For mobilization, we developed a safety culture for contractors to introduce them to the recordable incident free mind set.

Taking into consideration all safety challenges for the Shah Deniz 2 project execution, a full safety installation was performed and completed in Baku during the HSE mobilization. This was demonstrated through safety distance fencing with interlock gates to shut down the power, if opened, to create safe zones. Additionally, the Lock-Out-Tag-Out (LOTO) procedure was put in place. The objective of LOTO is to protect against hazardous energy being released from machinery, equipment or other energetic objects, while maintenance, refurbishment or servicing is performed.



Local Azeri operative completing a LOTO form prior to beginning work.

Experienced Shawcor resources gave an introduction of the Shawcor HSE management system, in Baku, to educate and involve everyone in the new location. Corporate safety audits of the management system were conducted on a regular basis and the results were measured against company standards. In response to a customer request to replace the compressed gas being used for hot work activities, acetylene which was previously used in Leith was replaced with propane which was a more stable gas.



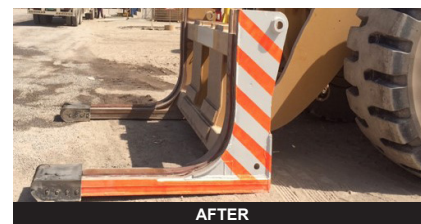
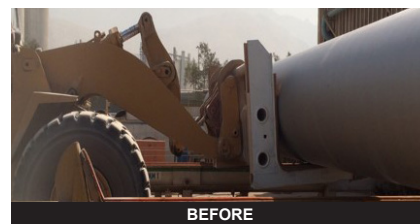
Operator safely using the new propane tanks to complete a hot work activity

A safer robotic cutback saw was implemented to eliminate the manual use of chainsaws by operators and its inherent risks. This solution adheres to Shawcor's commitment of engineering solutions that eliminate high risk activities for operators.



Chainsaw activities removed on site through the use of a robotic saw

Given the 24-hour production schedule of the project, safety of our staff at all hours of the day is crucial. In order to have the same level of visibility and safety for staff working at night, the facility in RAK took steps to make the forks of their rolling stock more visible by painting all loader forks with fluorescent paint so that operators working in the yard could easily see the forks from a distance, even in the dark, and take appropriate action to avoid them.



Rolling stock forks painted with fluorescent paint to make them more visible to night-shift operators

Continuous reviews and audits were held in all operations involved in the Shah Deniz 2 project. The primary focus was on closing active HSE Requests For Actions (RFA) raised by staff, to highlight unsafe activities and update Standard Operating Procedures (SOP) used to control tasks through standardizing work practices. We focused on the enhancement of our workers' safety culture with daily safety conversations, audits, regular safety stand downs and employee engagement through our HSE Requests For Action system. Shawcor extended our corporate recordable incident free culture to the Baku facility through training courses, regular tool box and larger site wide grand tool box talks.

ACHIEVEMENTS IN HEALTH, SAFETY AND THE ENVIRONMENT

HSE Performance - Baku Mobilization

The main achievements in Baku, Azerbaijan were:

- **750,000 man hours worked** with 0 lost work cases, 0 operational restricted work and only 1 minor medical treatment case
- **Safety enhancements completed on time** in line with overall mobilization
- **Full Lock-Out-Tag-Out (LOTO) system implemented** to protect workers from live machinery
- More than **50 employees recognized** for safety achievements in Baku
- Successful implementation of the key elements of the **Shawcor HSE Management System**
- **No major audit non-conformances** during the Shawcor divisional HSE audit completed
- More than **150 employees** trained in the recordable incident free culture
- Shawcor has been presented with the **HSE Excellence in Performance recognition award** from the primary MO client



Safety upgrades completed as part of the Baku facility mobilization

SOLUTIONS AND ACHIEVEMENTS SHAH DENIZ 2

HSE Performance - Established Sites Besides the excellent performance at the mobilization in Baku, our internal HSE standards were reinforced at established Shawcor sites used for the Shah Deniz 2 project.

The main achievements at sites other than Baku were:

- 512,000 man hours worked with 0 lost work cases, 0 operational restricted work and 0 medical treatment case
- Robotic saw successfully implemented to eliminate the use of manual chainsaws in Orkanger Operations
- Process adapted for use of chainsaws for cutting samples and pipe stripping activities · Propane successfully used for all burning operations in Leith Operations
- Process changes were made to standardize the use of propane for all future burning work through a structured management of change process
- Risk assessments and operator training were completed on the use of propane
- Introduction of fluorescent color coordinated forks for easy identification to operator and crew on night-shift in Ras Al Khaimah (RAK) operations

A PARTNER FOR THE SUCCESS OF SHAH DENIZ 2

At Shawcor, we bring together the outstanding products, services and knowledge of our industry-leading companies to deliver end-to-end support for every aspect of a pipeline operation. From consultation through solution development and installation, we get to know a company's operational challenges and needs from the inside out.

And we continue to serve customers to ensure the safety, reliability and performance of their assets throughout the entirety of their lifecycle, so they are always operating at maximum productivity and profitability.

Shawcor demonstrated exceptionally high quality, safety performance, on-time project delivery, innovative solutions, flawless execution, engaged leadership and employees, and positive customer recognition.