

Wintershall C-97 Water Injection Project

Wintershall is a wholly-owned subsidiary of BASF in Germany. They are active in exploration of oil and gas in different parts of the world. In Europe, the BASF subsidiary also trades and sells natural gas. They have been active in the exploration, production and transportation of oil and gas for more than 75 years and with its headquarters in Kassel, it now has become Germany's largest producer of crude oil and natural gas. In The Netherlands, they are a major gas producer and acreage holder in the southern North Sea, as well as in the United Kingdom and Denmark. In South America (Argentina), Wintershall is a major gas player with excellent growth potential in existing concessions and new exploration acreage. In Africa (Libya), the company is a well recognized independent and major operator with high production output due to excellent regional expertise.

Wintershall operates their oil producing facility As Sarah C-96, their largest oilfield, as well as the Jakhira C-97 field in northeast Libya. The project involves a transport line for produced water coming from As Sarah C-96 to Jakhira C-97 injection wells to maintain reservoir pressure by reinjection.

For material selection criteria, a technical evaluation of carbon steel versus Glassfiber Reinforced Epoxy (GRE) was made by the customer. The highly corrosive medium composition, the excellent Bondstrand GRE pipe properties complying with the design criteria and Wintershall's positive experiences with composite piping, resulted in their technical choice for Bondstrand pipe for this project.

The commercial evaluation, including the cost-effective installation concept, the availability of NOV Fiber Glass Systems' world-wide manufacturing facilities, which were capable to meet the short period required for project completion and the low total cost during the design lifetime of the pipelines, convincingly contributed to the final selection of Bondstrand pipe to do the job.

In May 2007, NOV Fiber Glass Systems (FGS) B.V. in Geldermalsen, The Netherlands, was awarded the purchase order for the manufacturing, supply and field service assistance of the C-97 Water Injection Project pipeline requirement where 85% of the job was produced. The remaining product was manufactured at the FGS Malaysia facility.

Project

Wintershall - Libya

Client

BASF - Germany

Pipe system

Bondstrand PN40:
61 km - 12"
28 km - 8"
Bondstrand PN26:
46 km - 8"

Operating conditions

Installation date

June 2008



www.fgspipe.com • fgspipe@nov.com

NOV Fiber Glass Systems

The pipe was manufactured in 12 meter unit lengths with integrally wound and pre-shaved Taper/Taper joints, enabling a fast adhesive bonding and pipe installation on site. The challenging delivery schedule was met with tight logistical planning.

All necessary high pressure fittings for above ground Valve Pit stations and Pig Launcher & Receiver stations, as well as adhesive kits and pipeline installation equipment, were manufactured by NOV Fiber Glass Systems for on-time supply.



Regular third party inspections on raw materials, manufacturing process & product and QA/QC requirements were successfully executed at our manufacturing locations.

Packing, loading and transport of materials in more than 200 containers (40 ft. size) by sea from Europe and Asia to the jobsites in Libya were performed using dedicated equipment to enable reliable loading, easy local storage, and short unpacking times. All material supplies, including some last minutes changes, were completed and supplied within the agreed six months delivery period.

At the start of the construction in September 2007, contractor's personnel were trained and certified by experienced NOV Fiber Glass Systems' Field Service Engineers to ensure good and reliable installation of the pipelines. This was done under third party surveillance by Germanischer Lloyd. Because of challenging and sometimes difficult local desert conditions, a specific installation plan and method was put in place by FGS and the contractor. Proper preparation of the trenches and workflow is essential for projects of this magnitude. It increases both the installation progress and quality.



As Bondstrand Taper/Taper pipe systems can be installed quickly, trench preparation can become a bottleneck in the progress if not properly planned. The assembly of pipe joints alongside the trench proved to be advantageous: the width of the trench could be minimized, it was less labor intensive, better alignment checks were possible and overall, it provided a safer working environment. A first crew assembled two pipe lengths into 24 meter sections which were then jointed by a second crew to form a pipe string. A third crew then lowered the string into the trench with three side-booms, making use of the natural flexibility (allowable bending radius) of the Bondstrand pipe.



A mutually agreed construction technique, together with a well-trained installation contractor achieved an impressive daily installation rate of up to 1 km.

Along with the pipeline construction, valve boxes

and pig launcher and receiver stations were part of the project. The involved fittings, like long sweep elbows, barred tees etc, were assembled into close tolerance spools in a pre-fabrication shop on the job-site.

During the installation period, pipe line isometrics were verified and the reliability of the final design secured by Caesar II stress analysis and AWWA –M45 load calculations, performed by qualified NOV Fiber Glass Systems' Engineers.

After completion of the job, a final evaluation of the project took place between the project teams of Wintershall and NOV Fiber Glass Systems.

Wintershall project management confirmed to be very satisfied with the final results and stated their expectations were fully met.