

Pipestream® evolves Pipeline Technology with Introduction of XPipe™

Richard Smith

Pipestream® is a global leader in developing advanced technologies for streamlined construction of new pipelines and automated reinforcement of existing pipelines for the onshore Oil and Gas industry. These innovations will deliver significant value for new developments, as well as for projects to repair and upgrade existing infrastructure. There are two principal products being prepared for launch, XHab™ and XPipe™. Both products are currently being technically qualified, with XHab™ available for immediate deployment and XPipe™ before the end of Q1 in 2011.

Despite numerous improvements in materials and processes in recent decades, the fundamental method of constructing an onshore pipeline has changed little over time. Line Pipe is ordered from a pipe mill (booking a manufacturing slot up to a year in advance of when the pipe will actually be delivered), then coated and transported by ship, rail and/or truck over large distances to the pipeline right-of-way, and finally strung and welded together, joint by joint. This describes the complexity of schedule, cost, supply chain and HSE issues that are involved in a typical pipeline construction project.

Pipestream has developed a system that enables thin-walled liner (e.g. CRA or PE) to be reinforced with multiple layers of an ultra-high-strength steel (UHSS) strip to manufacture a pipeline product with advanced structural properties—in many ways outperforming traditional API line pipe. Furthermore, the production unit that performs this process is transportable and built to operate “in the field” in conditions ranging from the desert to the Arctic. The end result is that finished pipe is continuously produced on the right-of-way.

The development of this new technology has followed a systematic qualification program which includes extensive analysis and testing as well as a review of compliance with existing US Federal Regulations and pipeline design codes. XPipe™ offers a new method of low cost pipeline construction suitable for onshore Oil and Gas pipelines in a variety of configurations. The pipe is based on a thin wall liner that provides fluid containment and corrosion resistance. This material will vary according to service requirements. The UHSS strips are fusion bonded epoxy (FBE) coated in a factory environment before transport to site. These are then pre-formed and helically wound around the liner to form a laminated high-strength reinforcing layer providing the hoop strength. These are then bonded using an adhesive to form a rigid pipe structure, and a secondary coating is applied.

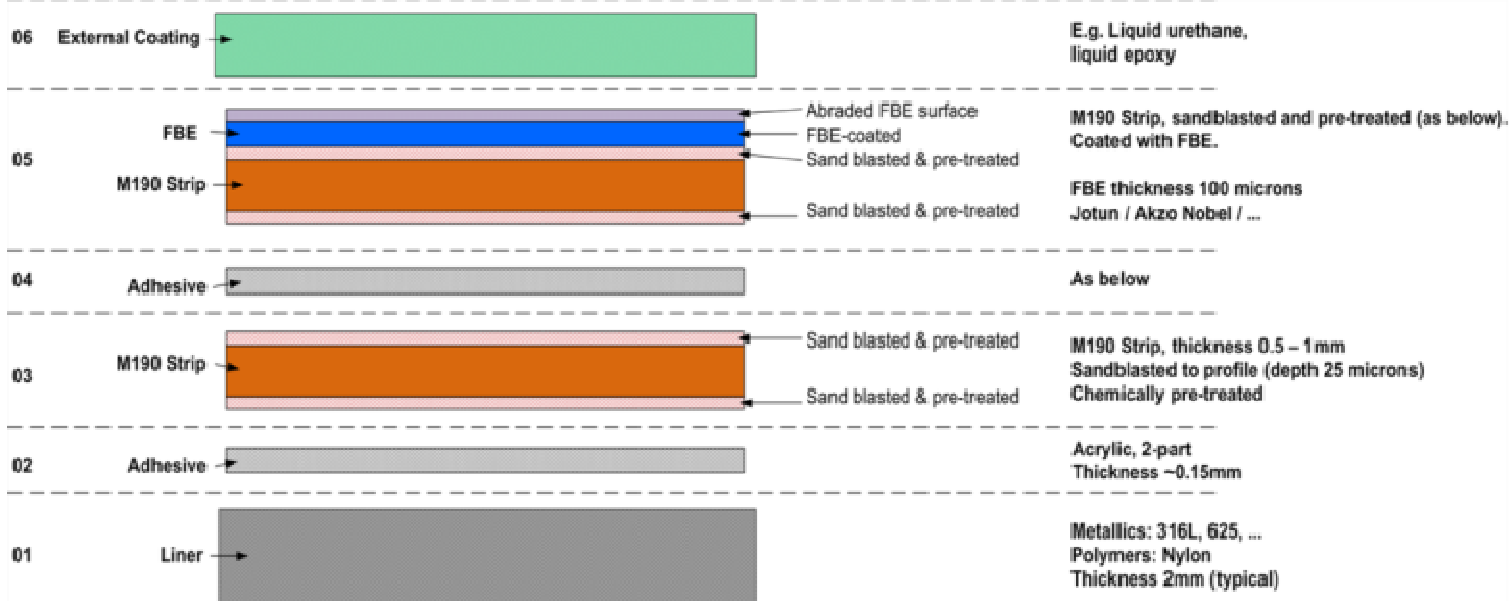


Figure 1 - Cross-Section Typical Pipe Structure



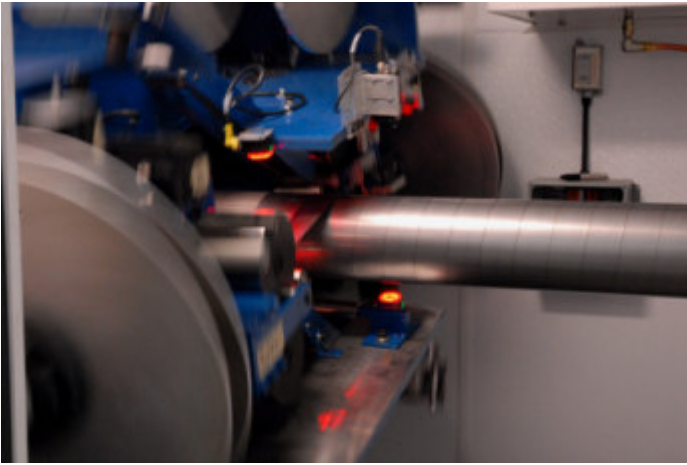


Figure 2&3 - Steel strip forming & Pay-off reels

All of the manufacturing equipment is housed in ISO containers and trailer/skid-mounted for ROW movement. The processes are automated and factory-quality QC is delivered.

XPipe™ Value to Clients:

- Up to 55% less steel, shorter & faster supply chain;
- Less intervention in live work process;
- Design and well hook up can be completed in hours;
- Pre-stocked coils and thin walled liner, rather than line pipe;
- Automation—fewer people, de-skilled process, factory QC;
- Reduced fatalities: less vehicle movement;
- Reduced injuries: fewer loading steps;
- Reduced footprint, reduced emissions; and
- Low friction factor liner, more throughput.

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SPDC EGG-2 Pipeline – Horizontal Directionally Drilled (HDD) Road Crossing

Franklin Ukaoha

The Eastern Gas Gathering System Phase 2 (EGGS-2) pipeline is a 58 km section of the 40" EGG-1 pipeline. It is designed to evacuate 1400 MMSCFD from the Gbaran Central Processing Facility, via a cold tie-in to EGG-1 at the Soku Liquefied Gas Supply Plant (LGSP). The 82 km 40" EGG-1 pipeline terminates at the Nigeria Liquefied Natural Gas (NLNG) Plant in Bonny.

EGGS1 achieved first gas 25 March 2007. Site construction works for EGG2 commenced Q3 2007 and first gas export was achieved 10 June 2010. The EGG2 pipeline traverses 19km of swamp and 39km land/seasonal swamps, which includes a major road crossing. This major road is straddled by a creek and a borrow pit, turned into a fish pond, at either side.

This article describes the methodology adopted, key challenges and lessons learned of one of the most challenging aspects of the EGG2 project: the Yenagoa Road HDD Crossing.

Background

The original location of the Yenagoa road crossing was abandoned due to rapid urbanization of the relatively new state capital, especially alongside the newly constructed dual carriage road. A route selection study identified a potential crossing location, where a creek runs in parallel along the road and a fish pond on the other side. Therefore no settlements were located on either side of the road.

The combination of these three obstacles creek-road-fish pond, made the use of conventional crossing techniques challenging and unattractive. After due consideration of the related challenges, the Horizontal Directional Drilling (HDD) crossing method was selected. Realization of an HDD comprises four major steps; design/planning, pilot hole drilling, reaming of the pilot hole, and pullback of pipe string.

