

Corrib Onshore Gas Pipeline Community Update

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People who attended our Open Day in the Broadhaven Bay Hotel, Belmullet, on 27th February 2007 asked a number of technical questions about the pipeline. This newsletter attempts to answer the main points as clearly as possible.

Anyone who would like further information on these or any other issues, is welcome to contact us on:

Phone: 097 20720 Email: routeinfo@rpsgroup.com

Introduction

There are three factors that influence the safety of any pipeline:

1. Planning and Design
2. Construction
3. Operation and Maintenance

Where all three stages are carried out carefully and to a high standard, the pipeline will be safe. The Corrib pipeline has been designed with safety as its highest priority.

Independent Safety Review – ‘The Advantica Report’

On behalf of the Department of Communications, Marine and Natural Resources, Advantica (UK gas consultant) carried out a comprehensive independent review of the Corrib onshore pipeline. Some of their key conclusions and recommendations were:

- Proper consideration was given to safety issues in the selection process for the preferred design option and the locations of the landfall, pipeline route and terminal.
- Pressure in the onshore pipeline should be limited to 144 bar. This measure results in a lower risk level and achieves a higher design safety factor.

The recommendations of the Advantica Report have all been accepted and work is now in progress towards implementing these.

Statutory Approvals

Approvals for the Corrib Pipeline will be required from An Bord Pleanála (under the new Strategic Infrastructure Act) and from the Minister of the Department of Communications, Marine and Natural Resources (DCMNR) under the Gas Act and under the Foreshore Act (Coastal Zone Management Division). The application process for these approvals will include the preparation of an Environmental Impact Statement (EIS) and consultation with landowners and the local community.

Route Selection Process

The route selection process will involve assessing a wide range of criteria and consultation with the local community on these and other possible criteria. Route selection will involve the following basic steps:

- Define Study Area
- Identify Route Corridor Options
- Select Preferred Routes
- Decide Final Preferred Route

The final preferred route will only be selected following ongoing consultation with the local community. It will be presented to An Bord Pleanála and the DCMNR with the relevant statutory applications (Strategic Infrastructure Act and Gas Act respectively).

Pipeline sections laid out and ready for welding



Manual welding in process



*“Train” of automatic welding
each completes one weld p*



Construction

Typical Construction Process

The sequence of pipeline construction on land begins with fencing off the working area (approximately 40m wide) and topsoil stripping within this area. This topsoil is not removed, but is kept to one side; it is not mixed with subsoil and it is replaced as the topmost layer during reinstatement.

Once the topsoil has been cleared, individual lengths of pipe (typically 12m long) are laid out and then welded together. In the case of the Corrib Gas pipeline, welds will be inspected before the pipe is buried in the ground; any defects will be repaired or cut out and re-welded. All transmission pipelines (upstream and downstream) must be pressure tested before being commissioned for service. The assembled pipeline will also be pressure tested using water at a pressure in excess of 500 bar.

The pipeline will be laid in a trench with a minimum depth of cover of 1.2m (approximately 4ft). Once the trench has been filled in and the soil reinstated there will be no evidence that the pipeline is there at all. For this reason markers will be installed to help locate the pipeline (eg at field boundaries, road crossings, changes of direction). All affected landowners will be made aware of the exact location of the pipeline.

Alternative Techniques

Specialised techniques are sometimes used or needed to construct sections of pipelines where ground conditions are difficult or where there are challenging constraints e.g. river crossings, busy roads, bog etc. Trenchless techniques (e.g. directional drilling) have also been used successfully in Ireland to cross the River Boyne and Upper Shannon with gas transmission pipelines. Trenchless techniques can offer advantages of reduced impact during construction stage, but success is highly dependent on ground conditions which must be investigated in advance. To confirm the feasibility of specialised construction methods in the estuary areas, geophysical and geotechnical surveys will be carried out shortly.

ing machines—
pass in sequence



Installation of welded pipeline section
using team of “side-boom” machines



Reinstatement on section of Gas Pipeline
to the West in Co Galway



Operation and Maintenance

What Will Be In The Onshore Pipeline

The gas in the Corrib Gas Field is a very pure form of gas, consisting of approximately 97% methane/ethane. It is found together with small amounts of water and condensate (hydrocarbons in liquid form very similar to a light oil e.g. diesel/ kerosene). There is no significant difference between the heat or energy content (kcal/kg) of the gas that is transported in the Corrib onshore pipeline to the terminal and the gas which leaves the terminal and flows into the Bord Gáis gas transmission and distribution systems. This means that the gas in the Corrib onshore pipeline is just as safe as that in any Bord Gáis pipeline.

Pipeline Maintenance

The offshore and onshore sections of the pipeline are protected against internal and external corrosion. In order to prevent internal corrosion, inhibitor chemicals will be continuously injected into the pipeline at the gas well out at sea. The inhibitor will be pumped out to the gas well via a small pipe, known as an umbilical, linked to the terminal. Protection for the outside of the pipeline will be provided via a 3 layer polypropylene coating as well as a low voltage back up system. Monitoring tools and techniques will also be used to gather data on the internal and external condition of the pipe and to ensure integrity along its full length. These include pipeline inspection tools that are pushed through the pipeline. All inspection data will be reviewed by the operator and regulatory authority.

Methanol Injection

Methanol is added to the gas at the well. It acts as an anti-freeze and prevents the formation of small ice crystals known as Hydrates. The methanol is recovered at the terminal and is re-used back at the gas well - i.e. it is continuously recycled.

Leak Detection — Odorant

Odorant is added to natural gas as an effective means of alerting domestic consumers of leaks in appliances, for instance when a gas cooker in a kitchen does not burn but the gas is still flowing. In the case of Corrib gas, odorant is only added after the gas has been treated in the terminal as is done elsewhere in the world.

Leak Detection — Pressure Drop

Pressure, temperature and gas flow rates will be monitored on a continuous basis at the gas wells and the terminal. This allows a calculation to be carried out to account for all gas entering and leaving the pipeline and alerts the operator rapidly about any potential problems.

Pressure Limiting Valve

Mechanical design of the pressure limiting valve is in progress. In fact this will be a series of valves to provide protection against overpressure by quickly isolating the upstream pipeline. It will use a logic system to shut off the flow using a 'HIPPS' system (High Integrity Pipeline Protection System). The closure time for this valve will be less than one minute. Simply put, the Pressure Limiting Valve is a shut off system. It is not a pressure reduction device. It will be tested regularly to ensure that it is fully functional.

Sources of Further Information

If you would like to learn more about the Corrib Onshore Pipeline you may contact RPS at the following address:

RPS

Seafield House
Belmullet, Co. Mayo.

Phone: 097 20720 Email: routeinfo@rpsgroup.com

Further information about the Corrib Gas pipeline can be found at the following websites:

Advantica Report

<http://www.dcmnr.gov.ie/TAG/Technical+Advisory+Group.htm>

Tag Report To Minister

<http://www.dcmnr.gov.ie/TAG/Technical+Advisory+Group.htm>

Peter Cassell Report

<http://www.dcmnr.gov.ie/TAG/Technical+Advisory+Group.htm>

Corrib Project

www.corribgas.ie

Centre For Public Enquiry Report

<http://www.publicinquiry.ie/reports.php>

Richard Kuperwicz Report

<http://www.publicinquiry.ie/reports.php>

Planning and Design

Corrib Onshore Pipeline Design

The pipeline will have a diameter of 508mm / 20” and wall thickness of 27.1 mm. To put this in context the Bord Gáis pipeline linking the ring main in Galway to the terminal at Bellanaboy is 9mm thick in most places. It will be made of high grade carbon steel (Grade 485, DNV OS-F101 specification) and will be capable of safely transporting the gas from the Corrib field.

Pipeline Pressure

The onshore section of the pipeline will normally operate at pressures of 100 – 120 bar. It has been designed to withstand pressure of up to 345 bar as the initial gas well pressure of the Corrib field is 345 bar. This was an original design consideration to cater for the possibility that the pressure in the pipeline could build to gas well pressure during exceptional circumstances— it was never intended for the pressure in the Corrib pipeline to reach 345 bar.

Some important things to note about the design of the onshore pipeline are:

- In accordance with the recommendations made by Advantica following their review, a pressure-limiting valve will be installed at the point the pipeline comes ashore. This valve will shut off the onshore section of the pipeline before the pressure rises above 144 bar.
- By limiting the pressure in the onshore pipeline to 144 bar the Corrib onshore pipeline will operate with the most conservative design safety factor used in Ireland.
- Pressure in the Corrib gas reservoir will naturally reduce, as the gas is produced. After 5 years of production, the maximum gas pressure at the gas wells will have dropped below 144 bar and gas pressure in any part of the pipeline will not exceed 144 bar.