



STATS GROUP
Managing Pressure, Minimising Risk



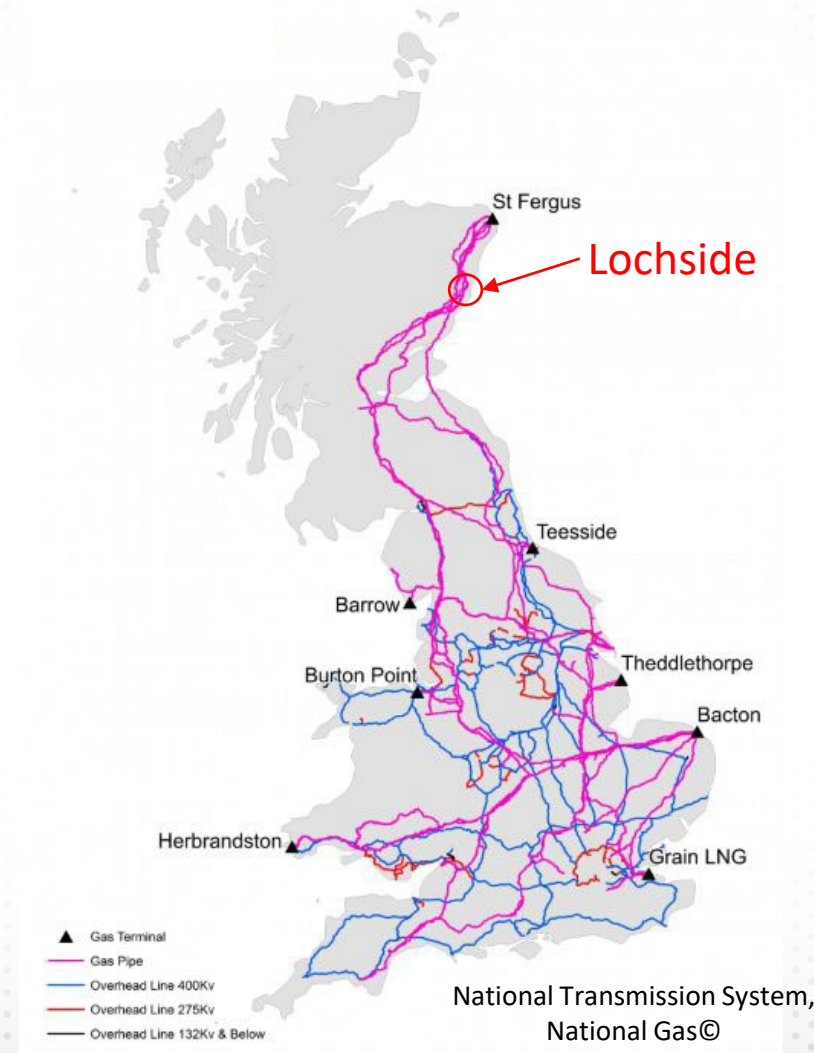
First use of Temporary Isolation Plug Technology on the National Transmission System

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Overview

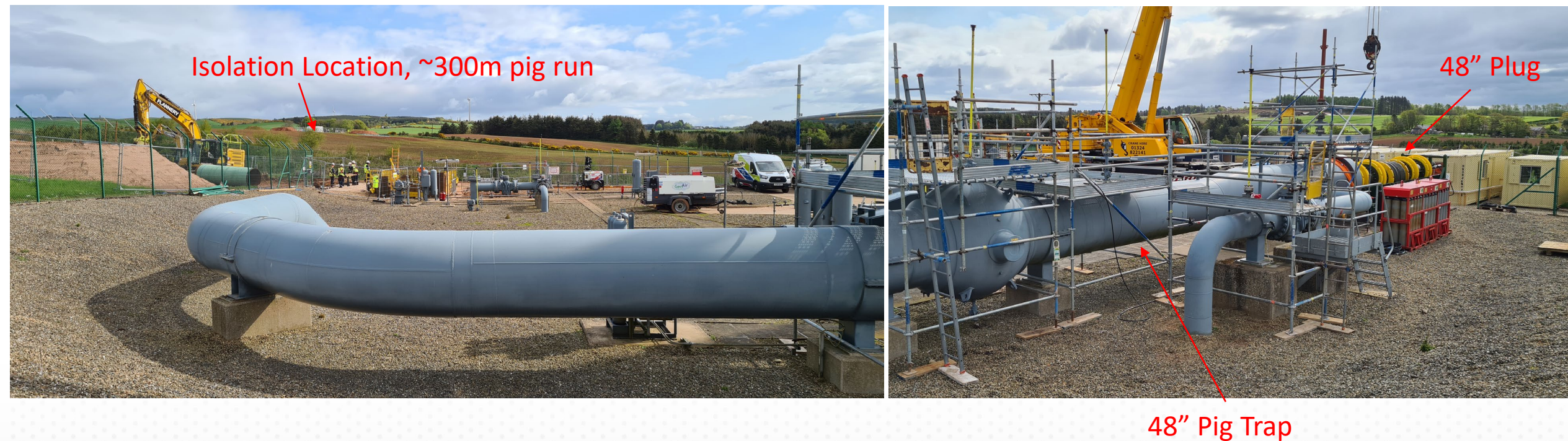


- National Gas own and operate the National Transmission System (NTS), 7600km of steel gas pipelines, >100barg, >48” diameter
- In 2023, for the first time National Gas used a temporary pipeline isolation plug instead of traditional methods to enable an Isolation Joint (IJ) replacement.
- A 48” Remote Tecno Plug isolated against 56barg of gas for 56km to the nearest block valve upstream.
- Use of the Remote Tecno Plug reduced methane emissions by 23x on this project.



Overview

- The Lochside Multi-junction site is located ~7miles north of Montrose
- The IJ is located on 'Feeder' pipeline 24. The nearest block valve upstream was located 56km north on this 48", 55barg operating pipeline.
- The chosen isolation location was ~300m away from the pig trap, though the IJ was located within the site fence



Isolation Joints

- Isolation / Insulation Joints (IJ's) provide electrical isolation between pipeline sections.
- They are essential for the cathodic protection system to work optimally, ensuring long term integrity of the pipeline
- IJ's are a weak point and therefore susceptible to failure;
 - Gas leak
 - Failure to provide electrical isolation
- IJ's aren't repaired in-situ, they need to be cut out and replaced

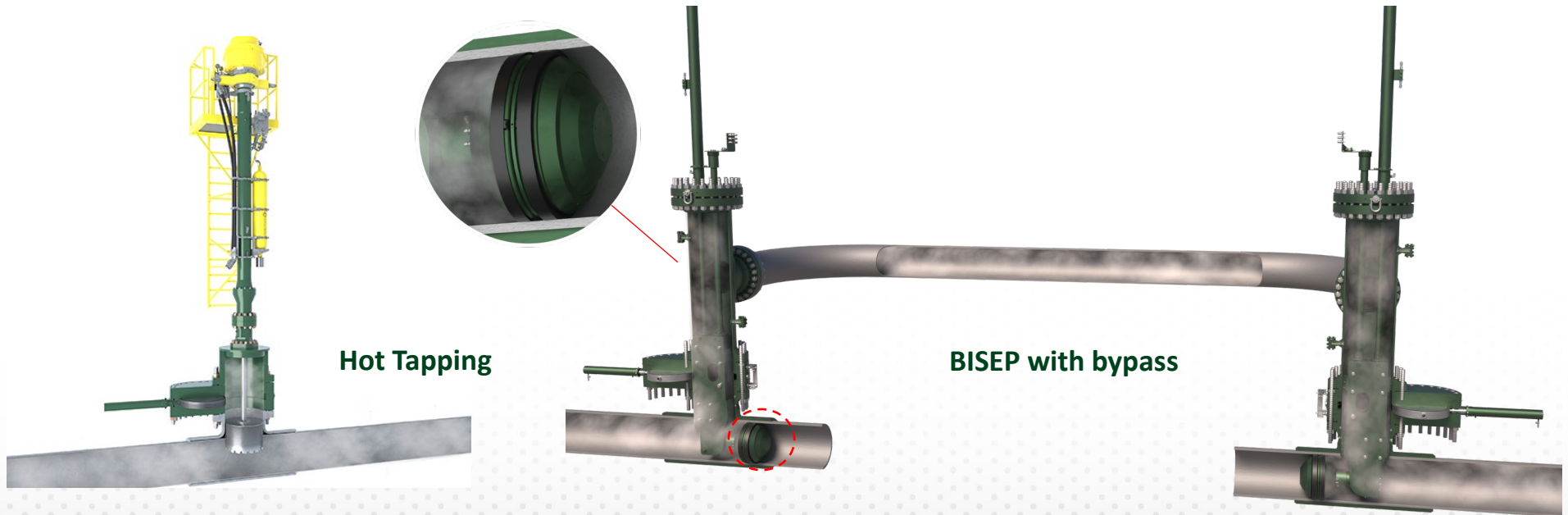


48" IJ – National Gas site - Lochside Multijunction

Solutions for IJ Replacement



Solution	Description	Main Pros	Main Cons
Valves and Venting	Simple, isolate either side of the IJ.	No Intervention. Quick Isolation. Can be cheap.	Valves may not seal due to wear/damage and can be >60km away. Venting takes a long time, environmental impact*
Hot Tap/Line Stop	Drill into pipe, deploy plug through hole and plug line	Flexible location, bypass enables continuous supply. BISEP leak tight.	Requirements: Intervention, Excavation Required, in service welding, welded tee's left (often buried) on the pipeline.



*** National Gas Emissions from Pipeline Venting makeup 11% of their annual emissions (542tonnes) methane discharged.**

Lochside would be 2215tonnes if vented.

Solutions for IJ Replacement

Isolation Type	Description	Main Pros	Main Cons
Cross compression (recompression units)	Gas powered units, extract gas from the isolated section and inject into adjacent section	Gas powered, affordable, no intervention required.	Current NG fleet limited to 3 units capable of reducing pipeline pressure to 7bar, with remaining gas vented to atmosphere. On Lochside this would be 233tonnes vs. RTP (9.5tonnes). Lead time, recompression time. Large equipment (12m trailer)

- >30years service in UK
- National Gas plan to commission new units in 2025 capable of reducing pipeline pressure to 1 bar.
- Smaller equipment for bringing pressures down further exists on the market and has been used for STATS on line stopping projects but time required can make it an unattractive option.



Recompression

Recompression Units

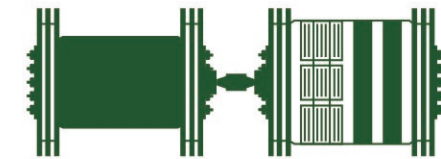
Solutions for IJ Replacement



Isolation Type	Description	Main Pros	Main Cons
Pigs	Pigged to the isolation location, plug line	Huge fleet available. Isolation(s) local to the worksite, less gas vented, more sold. Quick installation time.	Only suitable for piggable systems and access to the pig launcher is required.



48" Remote Tecno Plug (Lochside Multi-Junction)



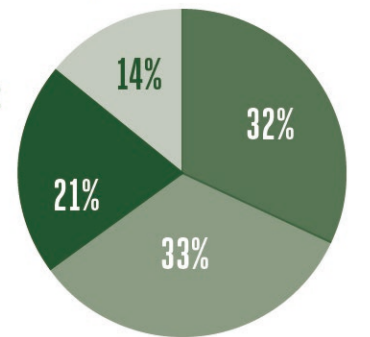
201 Deployments
10" to 48"
Regional Breakdown

157km
Longest Distance Pigged

19
Subsea

140 Days
Longest Isolation

165 bar
Highest Pressure



■ Europe / RoW ■ Middle East
■ North America ■ Asia Pacific

Remote Tecno Plug Track Record



Challenges



- During detailed engineering, one of the tee's was discovered to be oval due to poor manufacturing, this was cross checked against caliper data and the plug was adapted to ensure safe pigging.
- National Gas purged gas to nitrogen to air prior to breaking containment however this took ~2weeks due to suspected condensate in the low point (gully).



IJ Removal



Summary



- National Gas now have another qualified option in the toolbox.
- RTP took 24 hours to load, pig, set and test saving time vs. traditional alternatives.
- Emissions were reduced 24x using the RTP vs. traditional alternatives.
- Carbon equivalent of switching off 1760 gas boilers for a year OR removing 1000 cars off UK roads for a year.
- Sales value of gas not discharged was ~£125k.





National Gas are now producing new policy for the use of isolation pig technology which will

- Increase efficiency on future projects
- New policy could be more widely adopted by the Gas Distribution Networks



Emission-less pipeline isolations using isolation pig technology could be undertaken:

- Using Nitrogen for pigging where practical
- Using low pressure and volume recompression/vacuum units smaller than National Gas' planned 1 bar units for capturing methane during launching/receiving activities at the pig trap



The United Nations Environment Programme, Global Methane Assessment states that existing technologies can reduce methane emissions by 30% by 2030.

The greatest potential for cost saving while reducing emissions is in the oil and gas sector, where captured methane adds to revenue instead of being discharged to atmosphere.





Thank You For Your Attention
Questions?



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