



UNC Transmission Work Group

Reverse Compression into NTS

Discussion Draft for NGT

6th July 23

John Baldwin
Managing Director
CNG Services Ltd

john.baldwin@cngservices.co.uk

www.cngservices.co.uk

07831 241217

CNG Services Ltd

Low Carbon Innovations

cng services Ltd

Over the next 20 years, CSL's projects will contribute towards a CO₂ emissions saving of.....

17,500,000 tonnes

Celebrating over 16 years of innovation in gas

- CNG Services Limited (CSL) provides consultancy, design and build services to the biomethane industry, all focused on reducing Greenhouse Gas (GHG) emissions
- In the past 10 years our efforts have produced a material impact with an estimated 20 year project life reduction in CO₂ emissions of 17,500,000 tonnes through:
 - Biomethane injection into the gas grid
 - Running trucks on Bio-CNG
 - Acting as developer and design and build contractor for the Highlands CNG Project
- Working on a number of Biomethane, H₂ and CCUS innovation projects including:
 - Biomethane from manure with CCS
 - Biomethane direct into the NTS
 - Green H₂ into the NTS and Hydrogen Business Model Projects
 - Reverse Compression to Create Capacity for Biomethane Injection
- CSL is an ISO 9001, 14001 and 45001 approved company and has also achieved Achilles certification. CSL is GIRS accredited for design and project management and has been certified as a competent design organisation for high pressure UK onshore natural gas works by DNVGL



What is the problem?

- Achieving net zero is difficult
- There is potential for significant growth in green gas production across GB – e.g. biomethane, syngas and Hydrogen
- Inability to access network capacity is a key constraint
- Reverse compression to move gas from lower to higher pressure tiers makes gas grids smarter and makes capacity available
- Widespread elsewhere in Europe
- Cadent progressing a NIC project near Doncaster
- Mod 0808 addresses within DN Reverse Compression where an iGT installs a compressor, typically from MP/IP to LTS
- Opportunities identified for reverse compression to the NTS from an iGT
- Creates an iGT/NGT interface – an offtake, Shipper transactions
- Not precluded by the UNC
- Involves gas moving through an offtake from distribution to transmission for the first time?
- Is a UNC Mod desirable to recognise the reverse flow?



What is Reverse Compression?

- For capacity, best option is smart pressure control but this only helps 10% of projects
- For 90% of projects it is necessary to install a compressor where a lower pressure tier meets a higher pressure tier gas pipeline – Reverse Compression
- At times when the lower tier pipeline reaches its maximum pressure:
 - Compressor operates injecting gas from the lower pressure tier to the higher pressure tier pipeline
 - Operates on pressures ensuring that there is no circular flow
 - Only operates as required – saving OPEX as not having to inject into a higher pressure tier pipeline all the time. This should be a few hours every night, mainly summer
- Removes capacity constraints in the lower pressure tier pipeline
- Common practice in France, Denmark, Netherlands, Germany
 - Series of “Reverse Compressors” installed across the network
 - Allows new projects to inject green gas into the network
 - Reduces risk of flaring
 - RC into NTS requires odorant removal (as in Denmark)



UNC Questions

- iGT/NGT Connections are possible
 - not a novel concept
- Technically straightforward
 - 20 GB biomethane plants already injecting into higher pressure grids with similar reciprocating compressors
- Novel feature is direction of gas flow – gas flowing to NTS with odorant removal vessel
- Apply existing offtake provisions
 - Negative NTS Exit capacity?
- Scope to simplify requirements as flows will generally be intermittent (ie not much flow in winter in most cases as there will be sufficient LDZ demand) and small (typical 60 million kWh/annum biomethane plant has flow of around 700 scmh (with no propane)
- Views welcome on whether and what change is desirable
- NGT to raise a Mod to address any concerns they have?

