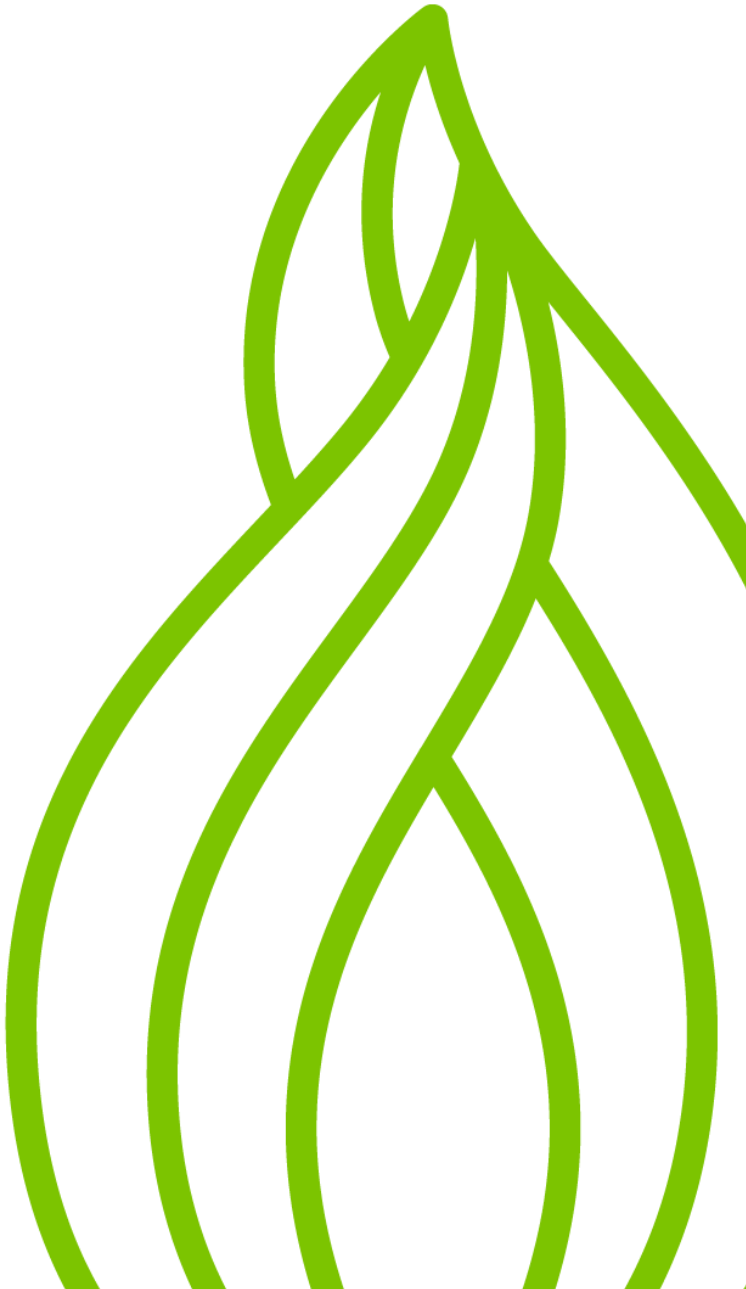
national gas transmission

Gas Quality Blending

Value Tracking Case Study



Gas Quality Blending

Background

Operators that deliver gas to the National Transmission System (NTS) are currently required to meet the legal specification for gas quality at the point at which their pipeline enters National Gas' terminal. Multiple sources of gas enter the NTS at St Fergus and Bacton which co-mingle within National Gas' terminal infrastructure before onward transmission on NTS pipelines out of the terminal. Some parties that deliver gas at those locations have expressed interest in National Gas Transmission developing interruptible gas quality blending services, enabling an operator to deliver off-spec gas provided that National Gas could achieve a compliant blend before the gas exited its terminal onto the NTS pipelines.

The properties of gas blending are well known, but in order for this service to be considered viable, the capability of the specific terminal structure, implications on NTS assets and National Gas' ability to meet its obligations under GS(M)R must be fully understood. Equally, users of the service will expect proven technical capability to forecast and manage any gas blending service in order to enter into commercial arrangements.

What's new?

The model of St Fergus was completed and both terminal models were validated against available recorded data, i.e. actual historical flows and gas quality from the incomers to the terminals was entered and the results observed at the exit points from the terminals. This simulated gas composition data at the exit points mostly matched the actual measured historical gas composition data for the different validation conditions. Discrepancies were attributed to incomer composition data where a daily average was given rather than the specific hourly values used on other flows. The hydraulic models were then used to run scenarios to blend specific incoming pipelines' gas qualities. A mix of projected flow and qualities for gas year 2022-23 and sensitivity cases outside the GS(M)R specification were used as inputs for the inputs from the UKCS terminals and flow configurations through the terminals were defined. These scenarios included steady state (all incomers at constant rates) and transient cases (starting at a steady-state and then simulating a trip of flow from one incomer). It was recognized that the volume of flows through the interconnectors and whether they are in import or export mode are commercially driven and therefore much more difficult to predict, therefore assumed flows and compositions were derived from historical data. The results for Bacton showed that the gas quality at all exit points from the terminal for all scenarios was GS(M)R compliant except for one area. This was because in the flow configurations modelled the GYPS offtake is directly downstream of the Perenco incomer so no commingling with on-spec gas occurred. Since not all input sources comingle within Bacton terminal, a homogeneous flow-weighted Wobbe Index at all exit points from the terminal is not achieved, which presents a risk to the operation of a blending arrangement because National Gas could not predict with confidence that all outlet points would be on-spec.

The benefits

Alongside the technical feasibility of a gas quality blending service, this project could significantly deepen the understanding of the capabilities of the NTS and natural gas assets in terms of gas blending capability. Learning could also help determine future terminal development, produce a framework for other blending solutions that may be required smaller scale connections. Innovative processes, controls, communications, or systems that are developed with the wider industry

Financial savings

The project is focussed on developing gas blending capabilities that will enable future development work. No financial benefits logged for this for but improved awareness may enable future savings.

Implementation

National Gas Transmission will be considering the outputs of these scenarios against how the terminals and the wider NTS are operated in reality to form a view on the viability of blending services. This is expected to include an assessment of whether they could serve to enhance or detract from security of supply, impacts on wider NTS operability and whether adequate mitigations can be designed such that blending arrangements could operate with no increased risk of non-compliant gas getting onto the NTS pipeline network and being delivered to consumers.