



Can we inject any old gas?

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The gas we use today is changing. Less than 50% of the gas in our network is now provided by North Sea gas production. Consequently our import infrastructure has increased fivefold over the past decade and there has been a significant move to include imported natural gas (both pipeline and liquefied natural gas or LNG) and alternative sources of gas, such as shale and bio gas.

Gas entering the UK transmission and distribution grid has to meet certain specifications under Gas Safety Management Regulations (GSMR). Under these regulations, a variety of different parameters and limits are used to describe what may be generally referred to as “gas quality”. These GSMR limits have been established over many years in order to ensure that gas combustion in all types of domestic appliance, and in commercial and industrial applications, is safe and efficient.

With the growth of imports, we now have a variety of sources for our supply and this changes the composition of the gas entering the UK grid. In some cases, for example with imported LNG, to ensure that GSMR gas quality specifications are met, nitrogen ballasting can be used to regulate the quality of the distributed gas. In other cases, gas sources of different compositions can be blended to achieve this. However, the possible benefit of adjusting the GSMR limits to allow a greater diversity of supply in future is now being recognised.

The Wobbe Index is generally regarded as the key combustion parameter for fuel gases. For a given gaseous fuel, it can be defined as the gross calorific value over the square root of the relative density. Its primary use is to serve as an indicator of the interchangeability of different gases. For standardised injector and supply-pressure conditions, gases of the same Wobbe Index (or Wobbe number) should provide the same thermal output when fully combusted, generally expressed in MJ/m³.

The Oban trial

A trial in Oban – a resort town on the South West coast of Scotland, which has its own isolated gas network – was undertaken by Scotia Gas Networks (SGN) to investigate the supply of gas outside the current UK specification legislated for by GSMR. Funded by the Network Innovation Competition, it sought to provide evidence to support a cost-effective new gas supply solution for the Scottish Independent Undertakings (SIU's) – isolated local distribution networks – following the closure of the LNG storage facility at Avonmouth. It was also foreseen as providing a potential roadmap for the UK adoption of a widened gas-quality (Wobbe Index) specification, subject to the project findings.

Requiring a specific exemption from GSMR to be granted by the HSE, the project involved a study of approximately 1100 properties and 2500 appliances fed by the SIU, including identifying and replacing any appliances unable to cope with varying gas quality. This initially involved the use of “test gases”, defined in EN 437, and providing the accepted threshold upper and lower Wobbe Index limits for H-gases in the EU, for short-term safe appliance operation. Then, LNG supplies were sourced which exceeded the upper Wobbe Index permitted by GSMR, before regasification and injection into the SIU, to be combusted by connected appliances. Spot-checks were carried out over the project duration to check appliance combustion was acceptable to industry norms, and that there were no other issues apparent.

Clearly, safe appliance operation is something HHIC take very seriously, and we engaged with those leading the project throughout. In particular, we were able to liaise between appliance manufacturers and the technical research team to help ensure specific queries were examined fully.

At the time of writing, the final project report is not yet published. We will fully review and digest the project findings and recommendations. Watch this space for a follow up article.....