

A greener generation of air compressors

Value Case Study



Sustainability

Project: NIA_NGGT0037
Compressor Balance of Plant Environmental Study
PEA cost: £175k
Duration: 1 year 7 months
Supplier: SKM Enviro
PEA benefits: £50k (per annum)
Benefits realised: £434k

Whole life savings*:

24,640
tonnes of CO₂ emissions reduced

£2.4m
financial savings

* Assuming a 20-year asset life on four sites

Background

NGGT operates a wide range of ancillary equipment on its gas compressor station sites in addition to the primary equipment that forms the gas compressor machinery train. This ancillary equipment is generically referred to as Balance of Plant (BoP). In the past, technology was chosen based on the equipment used before and what plant designers agreed was the best choice. This means that, across the NTS, where the age of assets varies significantly there is a considerable variety in the type of equipment installed, although different systems often fulfil the same function and are capable of meeting duty and process safety requirements.

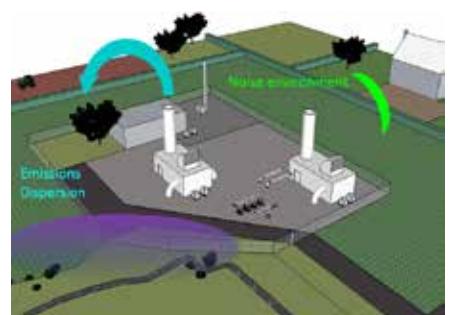
What's new?

The project team developed a software decision support tool which allows a comparison across a range of technology options on equipment such as valve actuators and fuel gas systems. This helps in determining which offers the best environmental cost benefit balance for NGGT and its customers. The tool allows the user to perform qualitative or quantitative assessments against 21 environmental criteria such as air emissions, waste and noise, and six operational criteria such as constructability and maintainability. Alongside the tool, the team also produced a series of best practice guides which compare the environmental cost benefit range of existing technology options.

The benefits

Operations staff were monitoring air compressor energy consumption and wastage data at three gas transmission compressor stations. Instrument air compressors provide the force for the operation of control valves and other tooling on site. Data loggers confirmed the loads from the 200 kW instrument air compressors were not constant.

With unnecessary loading and unloading of the compressors occurring for up to 70% of the time, the operational expenditure of running the three units was in the region of £400k per year. The BoP decision support tool established that variable speed drive (VSD) instrument air compressors are an alternative technology defined as "best available technique". The VSD instrument air compressors deliver a precise mass of air depending on system requirements thereby optimising whole life cost and reducing emissions compared to the alternative technologies.





Award-winning

The project was a winning entry in the first GTO Improvement Award ceremony that took place in November 2016

"We're driving the decision support tool across all sizes of project in the business as best practice, significantly reducing our environmental impact and increasing the value we deliver for our customers."

Neil Billingham,
Senior Engineer
NGGT

Savings to date:

£417k

2,500

tonnes of CO₂
emissions reduced

In addition to the initial three stations, a further air compressor at Alrewas was also identified for replacement. Investment in the VSD instrument air compressors is underway and it is expected that in total across the four sites, running costs will fall by £217k per year. CO₂ emissions will fall by 1,228 tonnes annually and there will be significant savings over the 20-year life of this instrument air system.

What's Next?

The case study is only one example of the potential value of the compressor balance of plant tool. As well as large scale projects, it is also being used for many smaller plant modifications, optimising the

value delivered. We expect to see significant further benefits across the other balance of plant assets as our compressor investment and asset health programmes progress.

As part of the project, twelve best practice guides were created for major plant areas including valve actuation, switch rooms, micro-renewable technologies, gas compressor seals and lighting. Going forward, our focus will be on identifying other major plant areas that are not currently addressed by the tool in order to include them in the software and develop best practice guides.

Annual savings	Churchover	Wormington	Felindre	Alrewas	Total
Operational savings (£k)	76	48	84	9	217
Carbon savings (tonnes)	449	284	495	4	1232

