

# ADAPT - HUMBLBY GROVE DEWPOINT UNIT



## Challenge

At the Humbly Grove Oil and Gas Field in Hampshire, UK, Humbly Grove Energy has constructed a 10 billion cubic feet gas storage facility.

The store operates by taking natural gas from the National Transmission System (NTS) through a 27 km long 24-inch diameter pipeline to the Humbly Grove oilfield. The gas is then pumped into the reservoir for storage. The gas can then be returned to the NTS after having been processed.

DNV was awarded the contract to provide the process design package for the dewpoint unit for gas treatment at the storage facility, ensuring gas exported back into the NTS met gas quality standards. The ADAPT unit is designed to treat the exported gas to simultaneously meet hydrocarbon and water dewpoint specifications.



### Expertise Provided

DNV was chosen for the project as they had an established track record, relevant technology available and operational plant support capability.

The technology chosen to provide the process design package for the unit involved the utilisation of DNV's ADAPT (Advanced Adsorption Process Technology) plant design. ADAPT is a licensed technology for high pressure natural gas treatment using adsorption technology for silica gel and molecular sieve plants.

With this technology DNV offer concept design, licensed process design, plant optimisation, performance monitoring and process support services to the worldwide natural gas business.

Licensed ADAPT technology was developed in-house over a 25 year research programme. The company currently has provided licensed plant designs to 16 plants and provides specialist support to more than 35 operational plant locations worldwide. DNV has also developed in-house adsorption plant models and a performance database.

For the Humbly Grove project DNV provided the basic engineering for the ADAPT dewpoint unit process design. This included the process flow diagram, a preliminary engineering line diagram, bed dimensions, plant cycle times, regeneration duty specification, heat and mass balance and preliminary major equipment datasheets.

This information was used to perform the detailed design of the plant. DNV provided consultancy and assistance throughout the EPC phase to ensure the successful implementation of the technology.

### Outcome and Benefits

The benefits of using DNV's ADAPT technology for this project include:

- Capex and opex savings
- Simple plant configuration and minimum equipment count to minimise capex
- Longer cycle times, extended adsorbent service life and reduced energy consumption to minimise opex
- Low pressure drop
- Environmental including much lower CO<sub>2</sub> emissions
- Plant flexibility
- High turndown
- Rapid start-up and shut-down
- Capability to handle variable feed gas compositions
- Operation under variable feed gas temperature and pressure

"Humbly Grove Energy are the latest in a number of natural gas operators that have recognised the commercial and operational advantages of ADAPT for natural gas treatment operations. The plant will provide great flexibility making it ideally suited to gas storage applications where there can be significant variations in process conditions, feed gas composition and plant throughput during operation."

- ADAPT Business Manager within DNV

"The technology offered by DNV is eminently suitable for gas storage where reliability and flexibility are key to plant performance. DNV supported the project well and their experience has been invaluable during design and plant operation."

- Operations Director at Humbly Grove Energy